



UNIVERSITY OF CALIFORNIA  
**SANTA CRUZ**  
1965–2015

THE ORIGINAL  
AUTHORITY ON  
QUESTIONING  
AUTHORITY

# General Catalog

2015 - 2016



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# 2015-16 GENERAL CATALOG

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The UCSC General Catalog is no longer available in print. Past years' catalogs are [archived online](#) in pdf format beginning with the 2003-04 edition. Printed catalogs prior to 2003-2004 are available in the Office of the Registrar.

## WELCOME

### ABOUT THE CATALOG AND INTRODUCING UCSC

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- About the Catalog
- Introducing UCSC

### FIELDS OF STUDY

### ACADEMIC CALENDAR

### UNDERGRADUATE ADMISSION AND FINANCIAL INFORMATION

---

- Admission
- Expenses and Financial Resources

### UNDERGRADUATE ACADEMIC PROGRAM

---

- Planning Your Academic Program
- Graduation Requirements
- University Requirements
- General Education Requirements
- Credit for Transfer Students
- College Requirements
- Major and Minor Requirements
- Evaluating Academic Performance
- Advising: Course Selection to Careers
- Undergraduate Research
- International Education
- Field and Exchange Programs
- Intercampus Visitor Program
- Cross-Campus or Simultaneous Enrollment
- Part-Time Program
- Summer Programs
- UCSC Extension
- Intersegmental Cross-Enrollment

### GRADUATE STUDIES

---

- Graduate Education
- Student life
- Application and Admission
- Fees and Expenses
- Financial Support

### RESOURCES FOR LEARNING AND RESEARCH

---

- University Library
- Computing and Technology Services
- Research Programs and Facilities

### CAMPUS LIFE AND STUDENT LIFE

---

- The Colleges
- Student Life

### PROGRAMS AND COURSES

---

- Program Statements
- Faculty
- Course Descriptions

### TEACHING STAFF AND UNIVERSITY ADMINISTRATION

### NONDISCRIMINATION STATEMENT

### APPENDIXES

### [ARCHIVE OF PREVIOUS YEARS' GENERAL CATALOGS](#)

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Revised: 09/01/15

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# WELCOME TO UC SANTA CRUZ

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## 2015-16 General Catalog

Welcome to UC Santa Cruz. For 50 years, UCSC has been known as an extraordinary place for students to pursue their interests and discover their passions.

That has never been more true than it is today, when UCSC is ranked first in the world for research influence. Faculty here are doing pioneering work that is recognized around the world; they are charting new directions and changing paradigms. For students—undergraduate and graduate—it means you will be learning from and working alongside people who are the best in their fields. You will be partnering with scholars, scientists, artists, and engineers whose own quest for knowledge is as alive today as when they were undergraduates.

And what a place to learn! This campus is one of the most beautiful in the country, with redwood forests, grassy meadows, and oak-studded hills affording unparalleled views of the Monterey Bay. The setting will inspire and renew you, while the facilities support your intellectual and physical development.

When UCSC first welcomed students to campus in 1965, they were greeted by the motto of Cowell College: The pursuit of truth in the company of friends. That motto resonates today on a campus where faculty and staff are dedicated to student success. Our 10 residential colleges provide small living and learning communities that offer leadership opportunities, extracurricular activities, and social engagement. Because these years are not solely about learning. Be sure to try new things, whether in student government or on the soccer field.

As we embark on our second half-century, I welcome you to UC Santa Cruz and look forward to having you become a part of our story.

Sincerely,



GEORGE BLUMENTHAL  
Chancellor



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# ABOUT THE CATALOG

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2015-16 General Catalog

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## UCSC GENERAL CATALOG 2015-16

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This catalog contains the basic information about UC Santa Cruz. A complete list of academic programs and concentrations, both graduate and undergraduate, appears in the [Fields of Study](#).

The next part of the catalog is divided into sections describing various aspects of the campus: [undergraduate admission and financial information](#), the [undergraduate academic program](#) (including advising and support services), [graduate education](#) (including information on graduate student admission, expenses, and financial support), [research programs and facilities](#), and the [10 residential colleges and student life](#).

The academic programs and courses offered at UCSC are described in detail in the [programs and courses](#) section. The listings are alphabetical, with appropriate cross-references.

The Santa Cruz teaching staff and their academic qualifications, the University of California administration, and the Santa Cruz campus administrative staff appear in the [teaching and administration](#) section.

The catalog constitutes the campus's document of record. While every effort is made to ensure the correctness and timeliness of information contained in

this catalog, changes are likely to occur after publication. On an ongoing basis, the university is examining ways to bring the greatest possible efficiency to the delivery of its programs and curricula. This process may result in changes in services, teaching and administrative staff, and curricula and courses that could not be reflected in this catalog, which was prepared well in advance of the 2014-15 academic year. Updates to course information are available in the quarterly [Schedule of Classes](#) and the [Class Search](#). (Additional web sites are referenced throughout this catalog. However, they are maintained by individual units and may not reflect approved general information, curricula, or course information.) In addition, several publications are available that include detailed information about specific subjects such as graduate programs, housing, and financial aid.

It is the responsibility of the individual student to become familiar with the announcements and regulations of the university that are printed in this catalog and other campus publications. The catalog is the document of record for major and program requirements. It is updated annually.

Revised: 09/01/15

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# INTRODUCING UC SANTA CRUZ

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2015-16 General Catalog

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## THE UNIVERSITY OF CALIFORNIA

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The University of California was chartered as a land-grant college in 1868. From its rural beginning, the university has developed into one of the world's most distinguished universities, acclaimed for its research, scholarship, and dedication to undergraduate and graduate education. There are 10 University of California campuses located regionally throughout the state: Berkeley, Davis, Irvine, Los Angeles, Merced, Riverside, San Diego, San Francisco, Santa Barbara, and Santa Cruz. In addition, there are some 800 associated research institutes, laboratories, agricultural field stations, and extension centers serving California and the nation. The university is the primary state-funded academic agency for research. Its library collection, with 37 million volumes, is among the best in the country.

The University of California faculty, more than 16,000 in number, is distinctive in its 31 living Nobel Laureates and 419 members of the National Academy of Sciences—more than any other college or university system. Faculty membership in the American Academy of Arts and Sciences totals 489.

The University enrolls more than 183,000 undergraduates selected from the top 12.5 percent of the state's high school graduates and approximately 50,000 graduate students. The 1.7 million living alumni enrich the nation with public service and leadership.

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## THE SANTA CRUZ CAMPUS

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Since its inception in 1965, the University of California, Santa Cruz, has been dedicated to excellence in undergraduate education, graduate studies, and research. UC Santa Cruz students can take advantage of innovative academic planning combined with the research resources and scholarship strengths of the University of California system. At UC Santa Cruz, a program of general education is enhanced with opportunities for academic specialization.

**Planned enrollment of the campus** for the 2015-2016 academic year is approximately 17,350 students, of whom 1,565 will be graduate students. UCSC seeks and welcomes students, faculty, and staff of diverse ethnic and cultural experiences and the campus plans to increase both its enrollment and resources and to diversify its educational and research opportunities over the next few years.

**UC Santa Cruz faculty and emeriti** include 14 members of the National Academy of Sciences, 26 members of the American Academy of Arts and Sciences, and 34 members of the American Association for the Advancement of Science. Numerous faculty have been awarded Guggenheim Fellowships, and several have been awarded national awards for distinguished teaching. Three faculty members, three bachelor's degree recipients, and two Ph.D. recipients have been named MacArthur Fellows, and since 1972, when UC Santa Cruz began participating in the program, about 120 Fulbright scholarships have been awarded to UC Santa Cruz students and alumni.

**The residential colleges** are an important part of the UC Santa Cruz undergraduate experience. The 10 colleges divide the university into smaller communities, each serving as a social and intellectual gathering place for 1,400 to 1,700 students and 30 to 110 faculty fellows from a variety of academic disciplines. Every undergraduate student affiliates with a particular college while participating in a campuswide academic program. All of the colleges are interdisciplinary, and all academic majors are open to students from all colleges.

Each college has a distinctive quality derived from its core course and extracurricular programs and from its faculty fellows and their academic disciplines. Detailed descriptions of the 10 colleges can be found in [The Colleges](#) section of the catalog.

**Undergraduate education** at UC Santa Cruz is focused on the individual student. UCSC's college core courses give first-year students a small-seminar experience in their first year; intensive work in writing, discussion, and critical reasoning; as well as an orientation to academic life. To fulfill the campus's rigorous comprehensive requirement, every senior must pass a comprehensive examination or complete an equivalent body of work.

Individual research is encouraged, and hundreds of research papers coauthored by UC Santa Cruz undergraduates and their professors have been published in journals. For additional information, visit the [Undergraduate Research Opportunities web site](#).

Annually, more than 500 UC Santa Cruz students broaden their academic careers through the [UC Education Abroad Program \(EAP\)](#), which allows students to incorporate full-time study abroad as UC credit toward their degrees. The EAP provides a vital

## Introducing UC Santa Cruz

international connection for academic and personal growth in an increasingly interdependent world (see [International Education Office](#)).

The UC Santa Cruz campus 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](#)).

**Graduate education.** The UC Santa Cruz campus offers graduate programs in more than 30 fields. Within the graduate programs, there are 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 information is provided in the [Graduate Education](#) section 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 Institute for Humanities Research (IHR) oversees a range of topical centers that promote interdisciplinary research, including the Center for Cultural Studies, the Center for Jewish Studies, the Center for Labor Studies, 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. 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](#).

**The central 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 an extensive library, 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 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), 985 Atlantic Avenue, Suite 100, 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> (Computer Engineering and 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](mailto:vpaa@ucsc.edu).\*

\*This paragraph was revised 03/01/16 to reflect the correct title of the Engineering Accreditation Commission of ABET.

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## FIELDS OF STUDY

	Undergraduate Education			Graduate Education				
	B.A.	B.S.	Minor	Certificate	M.A./M.F.A.	M.S.	Ph.D.	Designated Emphasis
<b>American Literature:</b> see Literature								
<b>Academic English</b>								
<b>Anthropology</b>	•		•				•	•
Archaeology							c	
Cultural anthropology							c	
Physical anthropology							c	
<b>Applied Mathematics</b>			•					
<b>Applied Mathematics and Statistics</b>						•	•	
<b>Applied Linguistics</b>								
<b>Applied Physics</b>		•						
<b>Art</b>	•							
<b>Art and Design: Games and Playable Media</b>	•							
<b>Art History;</b> see History of art and visual culture								
<b>Asian studies:</b> see East Asian studies								
<b>Astronomy and astrophysics</b>							•	
<b>Astrophysics</b> (see also Physics [Astrophysics])			•					
<b>Bilingual-multicultural education:</b> see Education								
<b>Biochemistry and molecular biology</b>		•						
<b>Bioengineering</b>		•						
Assistive Technology: Cognitive/Perceptual		c						
Assistive Technology: Motor		c						
Bioelectronics		c						
Biomolecular		c						
<b>Bioinformatics</b>		•	•					
<b>Biomolecular engineering and</b>						•	•	

Fields of Study

	Undergraduate Education			Graduate Education				
	B.A.	B.S.	Minor	Certificate	M.A./M.F.A.	M.S.	Ph.D.	Designated Emphasis
<b>bioinformatics</b>								
<b>Biological Sciences</b>								
Biology	•	•	•					
Bioeducation	c							
Ecology and evolution		•						
Ecology and evolutionary biology					•		•	•
Human biology		•						
Marine biology		•						
Molecular, cell, and developmental biology		•			•		•	
Neuroscience		•						
Plant sciences		•						
<b>Chemistry</b>	•	•	•			•	•	
Biochemistry		c						
Environmental chemistry		c						
<b>Chinese language</b>								
<b>Classical studies</b> (see also Literature)	•		•					
<b>Cognitive science</b> (see also Psychology)		•						
<b>Community studies</b>	•							
<b>Computer engineering (1)</b>		•	•			•	•	
Computer systems		c						
Digital hardware		c						
Networks		c						
Robotics and control		c						•
Systems programming		c						
<b>Computer science</b>	•	•	•			•	•	
<b>Computer science:</b> Computer game design		•						
<b>Creative writing:</b> see Literature								
<b>Critical Race and Ethnic Studies</b>	•							•
<b>Dance:</b> see Theater arts								
<b>Digital arts and new media (2)</b>					•			
<b>Drama:</b> see Theater arts								

Fields of Study

	Undergraduate Education			Graduate Education				
	B.A.	B.S.	Minor	Certificate	M.A./M.F.A.	M.S.	Ph.D.	Designated Emphasis
<b>Dramatic literature:</b> see Theater arts								
<b>Earth sciences</b>		•	•			•	•	
Environmental geology		c						
Ocean sciences		c						
Planetary sciences		c						
Science education		c						
<b>East Asian studies</b>			•					
<b>Ecology and evolution</b>		•						
<b>Ecology and evolutionary biology</b>					•		•	
<b>Economics</b>	•		•				•	
Applied economics and finance						•		
Business management economics	•							
Global economics	•							
<b>Education (3)</b>			•		•		•	•
Science, technology engineering, and mathematics			•					
Bilingual-multicultural education					c			
Multiple subjects credential (elementary)					c			
Single subjects credential (secondary)					c			
Language, literacy, and culture							c	
Learning and teaching							c	
Mathematics and science education							c	
Social and cultural contexts of education							c	
Teachers and teacher development							c	
<b>Electrical engineering</b>		•	•			•	•	
Electronics/Optics		c						
Communications, signals, systems, and controls		c						

Fields of Study

	Undergraduate Education			Graduate Education				
	B.A.	B.S.	Minor	Certificate	M.A./M.F.A.	M.S.	Ph.D.	Designated Emphasis
<b>English:</b> see Literature, and see Linguistics								
<b>Environmental studies</b>	•						•	•
Agroecology and Sustainable Food Systems	c							
<b>Environmental toxicology:</b> see Microbiology and Environmental Toxicology								
<b>Feminist studies</b>	•						•	•
Culture, power, and representation	c							
Law, politics, and social change	c							
Science, technology, and medicine	c							
Sexuality studies	c							
<b>Film and digital media</b>	•		•				•	
Critical studies	c							
Integrated critical practice	c							
Production	c							
<b>French Language</b>								
<b>French literature:</b> see Literature								
<b>Games and Playable Media</b>						•		
<b>Geology:</b> see Earth Sciences								
<b>German Language</b>								
<b>German literature:</b> see Literature								
<b>German studies</b>	•							
<b>Global information and social enterprise studies</b>			•					
<b>Greek Language:</b> see Greek and Literature								
<b>Greek literature:</b> see Literature								
<b>Hebrew language</b>								
<b>History</b>	•		•		•		•	

Fields of Study

	Undergraduate Education			Graduate Education				
	B.A.	B.S.	Minor	Certificate	M.A./M.F.A.	M.S.	Ph.D.	Designated Emphasis
Americans and Africa	c							
Asia and the Islamic world	c							
Colonialism, nationalism, and race							c	
Europe	c							
History of gender							c	
<b>History of art and visual culture</b>	•		•					
Religion and visual culture	c							
<b>History of consciousness</b>							•	•
<b>Human Biology</b>		•						
<b>Italian language</b>								
<b>Italian literature:</b> see Literature								
<b>Italian studies</b>	•		•					
<b>Japanese language</b>								
<b>Jewish studies</b>	•		•					
<b>Languages</b>								
<b>Language studies</b>	•		•					
Chinese	c		c					
French	c		c					
German	c		c					
Italian	c		c					
Japanese	c		c					
Spanish	c		c					
<b>Latin American and Latino studies</b>	•		•				•	•
<b>Latin language:</b> see Latin and Literature								
<b>Latin literature:</b> see Literature								
<b>Legal studies</b>	•		•					
<b>Linguistics</b> (4) (see also Language studies)	•		•		•		•	
Theoretical linguistics	c				c		c	
<b>Literature</b> (5)	•		•		•		•	•
Creative writing	c							
English-language literatures	c				c		c	

Fields of Study

	Undergraduate Education			Graduate Education				
	B.A.	B.S.	Minor	Certificate	M.A./M.F.A.	M.S.	Ph.D.	Designated Emphasis
French literature	c				c		c	
German literature	c							
Greek and Latin literatures	c							
Italian literature	c							
Modern literary studies	c				c		c	
Pre- and early modern studies	c				c		c	
Spanish/Latin American/Latino literatures	c				c		c	
World literature and cultural studies	c				c		c	
<b>Marine biology</b>		•						
<b>Marine sciences:</b> see Ocean sciences								
<b>Mathematics</b>	•		•		•		•	
Computational mathematics	c							
Mathematics education	c							
Pure mathematics	c				c		c	
<b>Medieval studies:</b> see Literature								
<b>Microbiology and environmental toxicology</b>						•	•	
<b>Molecular, cell, and developmental biology</b>		•			•		•	
<b>Music (6)</b>	•				•		•	
Electronic music			•					
Jazz			•					
<b>Network and Digital Technology</b>	•							
<b>Neuroscience</b>		•						
<b>Ocean sciences</b>						•	•	
Biology (see also Marine biology)						c		
Biological oceanography							c	
Chemical oceanography							c	
Chemistry						c		
Earth Sciences						c		
Geological oceanography							c	

Fields of Study

	Undergraduate Education			Graduate Education				
	B.A.	B.S.	Minor	Certificate	M.A./M.F.A.	M.S.	Ph.D.	Designated Emphasis
Physical oceanography							c	
Physics						c		
<b>Philosophy</b>	•		•		•		•	•
<b>Photography:</b> see Art								
<b>Physics (7)</b>		•	•			•	•	
<b>Physics (Astrophysics)</b>		•						
<b>Physics Education</b>		•						
<b>Plant sciences</b>		•						
<b>Playwriting:</b> see Theater arts								
<b>Politics</b>	•		•				•	•
<b>Portuguese language</b>								
<b>Psychology (5)</b>	•						•	
Cognitive psychology							c	
Developmental psychology							c	
Social psychology							c	
<b>Religious studies</b>								
<b>Robotics Engineering</b>		•						
<b>Russian language</b>								
<b>Science communication: Science writing</b>				•				
<b>Scientific Computing and Applied Mathematics</b>						•		
<b>Social documentation</b>					•			•
<b>Sociology (5)</b>	•		•				•	•
<b>Spanish for Heritage Speakers</b>								
<b>Spanish language</b>								
<b>Spanish literature:</b> see Literature								
<b>Spanish Studies</b>	•							
Languages and Linguistics	c							
Literature and Culture	c							
<b>Statistics</b>			•					•
<b>Statistics and Applied Mathematics</b>						•	•	
<b>Sustainability Studies</b>			•					
<b>Technology and information management</b>		•	•			•	•	

Fields of Study

	Undergraduate Education			Graduate Education				
	B.A.	B.S.	Minor	Certificate	M.A./M.F.A.	M.S.	Ph.D.	Designated Emphasis
<b>Theater arts</b>	•		•		•			
Dance	c		•					
Design and technology	c							
Drama	c							
<b>Visual Studies</b>							•	•
<b>Western civilization:</b> see Literature								
<b>Women's studies</b> (see Feminist Studies)								
<b>Writing</b>								
<b>Yiddish Language</b>								
<p><b>Combined majors.</b> 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.</p> <p><b>c</b> = 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 program on the page indicated.</p> <p><b>1.</b> A combined B.S./M.S. program in computer engineering is also available. Undergraduate students in computer engineering, robotics engineering, electrical engineering, and computer science may apply to the program.</p> <p><b>2.</b> A Master of Fine Arts (M.F.A.) degree is awarded in digital arts and new media.</p> <p><b>3.</b> Because California state law requires prospective teachers to earn a bachelor's degree in an academic discipline other than education, no undergraduate major is offered. All teaching credentials are earned postbaccalaureate. UCSC offers the professional clear Cross-cultural, Language, and Academic Development (CLAD). (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). A Doctor of Education (Ed.D) in collaborative leadership is also available.</p> <p><b>4.</b> A combined B.A./M.A. program is also available.</p> <p><b>5.</b> An intensive major is also available.</p> <p><b>6.</b> A B.M. degree in music also available. A Doctor of Musical Arts (D.M.A.) degree in composition is also available.</p> <p><b>7.</b> Combined B.S./M.S. in physics is available with concentration in:</p> <ul style="list-style-type: none"> <li>(a) Materials and device physics</li> <li>(b) Energy and the environment</li> <li>(c) Computational physics</li> <li>(d) Medical biophysics</li> </ul>								
<p><b>Degrees</b> B.A. = Bachelor of Arts</p>								

## Fields of Study

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

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## KEY DATES 2015-16

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<b>Fall Quarter 2015</b>	
Quarter Begins	September 19 Saturday
Instruction Begins	September 24 Thursday
Holidays	November 11, 26, 27 Wednesday, Thursday, Friday
Instruction Ends	December 4 Friday
Final Exams	December 7 -10 Monday-Thursday
Quarter Ends	December 10 Thursday
Holidays (not falling within quarter)	September 7, December 24, 25, 31, January 1 Monday, Thursday, Friday, Thursday, Friday
Campus closure	Thursday, December 24, 2015-Friday, Jan. 1, 2016
Days of Instruction	49
<b>Winter Quarter 2016</b>	
Quarter Begins	January 4 Monday
Instruction Begins	January 4 Monday
Holidays	January 18, February 15 Monday, Monday
Instruction Ends	March 11 Friday
Final Exams	March 14-17 Monday-Thursday
Quarter Ends	March 17 Thursday
Holiday (not falling within the quarter)	March 25 Friday
Days of Instruction	48
<b>Spring Quarter 2016</b>	
Quarter Begins	March 28 Monday
Instruction Begins	March 28 Monday
Holiday	May 30 Monday

Key Dates for 2015-16

Instruction Ends	June 3 Friday
Final Exams	June 6-9 Monday-Thursday
Quarter Ends	June 9 Thursday
Days of Instruction	49
Commencements	June 10-12 Friday-Sunday
Total Days of Instruction	146

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## UNDERGRADUATE ADMISSION

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### 2015-16 General Catalog

Undergraduate admission to the University of California is based on academic achievement, as well as a wide range of personal accomplishments and educational contexts. Minimum admission qualifications are the same for each UC campus, but each campus uses faculty-approved selection criteria when the number of qualified applicants exceeds capacity.

If you are considering applying to UC Santa Cruz, the Office of Admissions wants to help you learn more about the campus and its distinctive educational programs. For more information, see [Undergraduate Admissions](#).

If you are able to visit the campus, you may wish to take a student-led tour. The Office of Admissions offers tours on weekdays, and reservations are required. See [Campus Tours](#) for information and tour reservations. You can also visit UC Santa Cruz through our [Virtual Tour](#) of the campus.

The Undergraduate Admissions Office also offers Transfer Information Sessions for junior-level transfer students. For session information and reservations, please see [Transfer Information Sessions](#).

The University of California, Santa Cruz, continues to take positive steps to increase the diversity of the student population, including applicants coming from low socioeconomic backgrounds, 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. The university does not discriminate on the basis of race, color, national origin, religion, sex, gender identity, pregnancy (pregnancy, childbirth, and medical conditions related to childbirth), disability, age, medical condition (cancer-related), ancestry, marital status, citizenship, sexual orientation, or status as a military veteran or special disabled veteran in admission to or participation in its programs, activities, or services.

**Educational Opportunity Programs** at UC Santa Cruz are designed to encourage students from educationally and/or economically disadvantaged backgrounds to prepare for and enter the university. For a description of these programs, see [Educational Opportunity Programs](#).

**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 quality of the applicant's personal statement 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 web site](#).

**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 2010 graduated in four years; 75 percent of those who entered in 2009 graduated in five years; and 77 percent of those who entered in 2008 graduated in six years. In recent years, 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. These graduation rates are well above the national averages.

In accord with the Education Amendments of 1976, Section 493A, more detailed information regarding retention is available on the [Institutional Research Web site](#).

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## ADMISSION PROCEDURES

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The University of California Application for Undergraduate Admission and Scholarships may be accessed beginning August 1 through [admissions.ucsc.edu](#).

In addition to the application, the above site includes a wealth of information for prospective UC students about undergraduate education, admission, financial aid, and various topics of interest.

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## APPLICATION FILING PERIODS

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Applications for the fall quarter must be submitted during the month of November. Applications for winter quarter admission are accepted only as enrollment allows. Check the Office of Admissions in mid-June to see whether UCSC is accepting applications for winter quarter. UCSC does not accept applications for spring quarter admission.

Quarter of Attendance	Application Filing Period
Fall quarter 2016	November 1–30, 2015
Winter quarter 2017	July 1–31, 2016
Fall quarter 2017	November 1–30, 2016
Winter quarter 2018	July 1–31, 2017

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## APPLICATION FEES

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The application fee is \$70 (\$80 for international nonimmigrant applicants) to apply to one campus of the university. 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.

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## FEE WAIVERS

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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.

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## ADMISSION AS A FIRST-YEAR STUDENT (FRESHMAN)

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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 14 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 at [admissions.ucsc.edu](http://admissions.ucsc.edu). 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](#)).

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## HIGH SCHOOL PREPARATION FOR UNIVERSITY WORK

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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 Requirement](#) 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.

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## SUBJECT REQUIREMENT

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**a. History/social science—two years required.** Two years of history/social science, including one year of world history, cultures, and geography; and one year of U.S. history or one half year of U.S. history and one half year of civics or American government.

**b. English—four years required.** Four years of college preparatory English that include frequent and regular writing, and reading of classic and modern literature. No more than one year of ESL-type courses can be used to meet this requirement.

**c. Mathematics—three years required, four years recommended.** Three years of college preparatory mathematics that include the topics covered in elementary and advanced algebra and two- and three-dimensional geometry. Approved integrated math courses may be used to fulfill part or all of this requirement, as may math courses taken in the seventh and eighth grades that your high school accepts as equivalent to its own math courses.

**d. Laboratory science—two years required, three years recommended.** Two years of laboratory science providing fundamental knowledge in at least two of these three foundational subjects: biology, chemistry, and physics. Advanced laboratory science courses that have biology, chemistry, or physics as prerequisites and offer substantial additional material may be used to fulfill this requirement. The last two years of an approved three-year integrated science program that provides rigorous coverage of at least two of the three foundational subjects may be used to fulfill this requirement.

**e. Language other than English—two years required, three years recommended.** Two years of the same language other than English. Courses should emphasize speaking and understanding, and include instruction in grammar, vocabulary, reading, composition, and culture. American Sign Language and classical languages, such as Latin and Greek, are acceptable. Courses in languages other than English taken in the seventh and eighth grades may be used to fulfill part of this requirement if your high school accepts them as equivalent to its own courses.

**f. Visual and performing arts discipline (VPA)—one year required.** One year-long course of visual and performing arts chosen from the following: dance, drama/theater, music, or visual art.

**g. College preparatory electives—one year required.** One year (two semesters), in addition to those required in “a–f” above, chosen from the following areas: visual and performing arts (non-introductory level courses), history, social science, English, advanced mathematics, laboratory science, and a language other than English (a third year in the language used for the “e” requirement or two years of another language).

**Reading.** University students must be able to read and understand scholarly publications, analyze what they read, and question themselves about an author’s intentions, viewpoint, arguments, and conclusions. You should read commentaries and essays as well as textbooks, and a wide variety of other material—including literature, biography, nonfiction, and criticism—in addition to what you are required to read in class.

**Writing.** You must learn to write clearly and skillfully in English and to think critically and analyze what you learn in class and in your reading, so that you can present your ideas in a clear and persuasive manner.

University students proficient in composition must be able to understand the assigned topic, select and develop a theme by argument and example, use words and sentences that clearly and precisely express what they mean, demonstrate an understanding of the rules of standard English, and punctuate and spell correctly.

**Mathematics.** A number of fields of study require preparation in mathematics beyond the three years necessary for admission to UCSC. All majors in engineering and the physical, mathematical, and life sciences include courses in calculus, as do programs leading to professional degrees in medicine, dentistry, optometry, and pharmacy. Moreover, many majors in the social sciences, business, and economics require statistics and/or calculus.

The recommended four years of high school mathematics should include basic operations with numerical and algebraic functions; operations with exponents and radicals; linear equations and inequalities; polynomials and polynomial equations; functions and their graphs; trigonometry, logarithms, and exponential functions; and applications and word problems.

**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 can enhance your chances for admission to UC Santa Cruz.

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### HIGH SCHOOL PROFICIENCY EXAMINATION

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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 Proficiency Examination
- General Educational Development (GED) Certificate
- Proficiency tests from other states and other countries

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### TRANSFER CREDIT

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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.

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## ADMISSION AS A TRANSFER STUDENT

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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 [Major Preparation 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 [admissions.ucsc.edu](http://admissions.ucsc.edu). 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.

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## UC SANTA CRUZ TRANSFER ADMISSION GUARANTEE (TAG) PROGRAM

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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 early review of academic records, notification that admission to UCSC is guaranteed (subject to the conditions of the program), opportunities for advising about major preparation and general education and/or Intersegmental General Education Transfer Curriculum (IGETC) requirements, informational mailings, and invitations to events. All

## Undergraduate Admission

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, 2015, for fall 2016 consideration. UCSC accepts transfer admission agreements for fall quarter only.

Further information may be found at [Transfer Admission Guarantee \(TAG\) Program](#).

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### UC TRANSFER ADMISSION PLANNER (TAP)

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The UC Transfer Admissions 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](#).

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### CREDIT FOR COURSES TAKEN ELSEWHERE

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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 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.

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### UC SANTA CRUZ TRANSFER SERVICES

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The Office of Admissions provides information to all students who wish to transfer to UC Santa Cruz. For prospective transfer students and their families, the Office of Admissions offers Transfer Information Sessions. Transfer Information Sessions are small-group meetings in which an Admissions adviser presents information about transfer admissions matters 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

[admissions.ucsc.edu/transferworkshops](http://admissions.ucsc.edu/transferworkshops).

Student-led guided tours take place year-round and also require advance reservations. Please see [admissions.ucsc.edu/campustours](http://admissions.ucsc.edu/campustours) to make a reservation.

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.

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### UC SANTACRUZ OFFICE OF ADMISSIONS TRANSFER PREPARATION PROGRAM (TPP)

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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](#).

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## ADMISSION OF U.S. STUDENTS FROM OUTSIDE CALIFORNIA

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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 [Out-of-State Students](#). Information for all 10e 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](#).

For more information about undergraduate out-of-state admissions, please see [Out-of State Students](#) or e-mail [outofstateadmissions@ucsc.edu](mailto:outofstateadmissions@ucsc.edu).

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## ADMISSION OF INTERNATIONAL STUDENTS

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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 Admissions. For information, write to [internationaladmissions@ucsc.edu](mailto:internationaladmissions@ucsc.edu) or the Office of Admissions, University of California, Santa Cruz, 1156 High Street, Santa Cruz, CA 95064.

If your native language is not English, you must certify proficiency in English by one of the following methods: earning a score of 80 or higher on the Internet-based Test of English as a Foreign Language (a minimum score of 550 on the paper-based TOEFL), or earning a minimum score of 7.0 on the International English Language Testing System (IELTS) exam, earning a score of 560 or higher on the Writing section of the SAT Assessment test, or completing two transferable English composition courses with grades of B or higher in a U.S. college or university.

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 more information about undergraduate international admissions, please see [International Students](#) or send e-mail to [internationaladmissions@ucsc.edu](mailto:internationaladmissions@ucsc.edu).

For information about services for international students, see the International Education Office at [International Education Office](#).

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## READMISSION

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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 [advising.ucsc.edu/student/read](http://advising.ucsc.edu/student/read). The completed application should be filed, along with the nonrefundable \$70 application fee, with the Office of Admissions during the appropriate period:

Quarter of Attendance	Application Filing Period
Fall quarter	November 1–April 1
Winter quarter	July 1–October 1
Spring quarter	October 1–January 2

If during your absence you attended another UC campus, an official transcript must be submitted to the Office of 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.

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## ADMISSION TO SPECIAL CATEGORIES

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For information on applying for admission in the categories described below, please contact the Office of Admissions at [admissions@ucsc.edu](mailto:admissions@ucsc.edu).

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### SECOND BACHELOR'S DEGREE

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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.

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### LIMITED STATUS

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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.

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## NONDISCRIMINATION AND AFFIRMATIVE ACTION POLICIES

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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 identity, pregnancy<sup>1</sup>, physical or mental disability, medical condition (cancer related or genetic characteristics), ancestry, marital status, age, sexual orientation, citizenship, or service in the uniformed services<sup>2</sup>. The university also prohibits sexual harassment.

This nondiscrimination policy covers admission, access, and treatment in University programs and activities. University policy also prohibits retaliation for bringing a complaint of discrimination or participating a complaint process or investigation pursuant to this policy.

Inquiries regarding the University's student-related nondiscrimination policies may be directed to [Conduct and Community Standards](#), (831) 459-1738, or e-mail [sja@ucsc.edu](mailto:sja@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 the Office for Diversity, Equity, and Inclusion, (831) 459-3676 or e-mail [cbene@ucsc.edu](mailto:cbene@ucsc.edu).

Inquiries regarding UCSC's Policy on Sexual Assault, the UC Policy on Sexual Harassment and Procedures for Reports of Sexual Assault(s) and Sexual Harassment and/or violations of Title IX may be directed to Title IX Coordinator/Sexual Harassment Officer Tracey Tsugawa, (831) 459-2462, or e-mail [ttsugawa@ucsc.edu](mailto:ttsugawa@ucsc.edu).

Student inquiries regarding disability or disability accommodations may be addressed to the Director, Disability Resource Center, (831) 459-2089; or e-mail [drc@ucsc.edu](mailto: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 e-mail [ashish@ucsc.edu](mailto:ashish@ucsc.edu).

For additional information about University policies related to nondiscrimination and affirmative action, see the [Nondiscrimination Policies](#) section of the catalog.

## Undergraduate Admission

**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.

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## EXPENSES AND FINANCIAL RESOURCES

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2015-16 General Catalog

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### EXPENSES

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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](#) 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

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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 enrollment 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 web site](#) 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 2015–16 is available in the quarterly Schedule of Classes and on the web at [Course Fees](#).

#### NONRESIDENT TUITION

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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 [Appendix A](#).

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 Expenses and Financial Resources

UNDERGRADUATE BUDGET, 2015-16				
Students Living <b>On Campus</b>	California Residents		Nonresidents	
	One Quarter	F-W-S Quarters	One Quarter	F-W-S Quarters
<b>Required Tuition and Fees</b>				
Student Services Fee (formerly University Registration Fee)	\$340.00	\$1020.00	\$340.00	\$1020.00
Tuition (formerly Educational Fee)(a)	3,740.00	11,220.00	11,976.00	35,928.00
Campus Based Fees	406.98	1,220.84	406.98	1,220.94
USHIP Health Insurance (waivable)(see above)	878.00	2,634.00	878.00	2,634.00
Subtotal	\$5,364.98	\$16,094.94	\$13,600.98	\$40,802.94
<b>Estimated Personal Expenses (b)</b>				
Room and board	\$5,041.00	\$15,123.00	\$5,041.00	\$15,123.00
Books and supplies	483.00	1,449.00	483.00	1,449.00
Personal Expenses	613.00	1,839.00	613.00	1,839.00
Transportation	192.00	576.00	192.00	576.00
Subtotal	6,329.00	18,987.00	6,329.00	18,987.00
<b>Total Budget</b>	<b>\$11,693.98</b>	<b>\$35,081.94</b>	<b>\$19,929.98</b>	<b>\$59,789.94</b>
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 \$1,870; two quarters at \$3,740.				
b) Estimated personal expenses for students living off campus total \$4,844 per quarter or \$14,532 for three quarters. Estimated personal expenses for students living with family total \$3,328 per quarter or \$9,984 for three quarters.				

### LATE FEES

You may be assessed late fees if you fail to make university payments or enroll by the specified deadlines. For example, late fees are assessed on a graduated basis for each month there is an unpaid balance on your university account. Late fee amounts of \$50 each are assessed for a late registration payment and/or late enrollment, \$25 for a late housing payment, and \$12.50 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 web site](#). The room and board amount of \$15,123 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 Expenses and Financial Resources

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 \$100 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 web site, 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 web site at [Financial Aid web site](#).

SCHEDULES OF REFUNDS	
<b>All Continuing and Readmitted Students and New Students Not Receiving Federal Financial Aid</b>	
Number of calendar days	Percentage of fees refunded*
1st day of instruction	100
2-7	90
8-18	50
19-35	25
36 and over	0
<b>New Students Who Receive Federal Financial Aid and Withdraw during Their First Academic Term</b>	
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 \$100 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 Deferred Payment Plan (DPP) 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 DPP application. Any student in good financial and academic standing may apply for DPP. Students receiving financial aid sufficient to cover registration fees in full

## Undergraduate Expenses and Financial Resources

are not eligible for this plan. For more information about how to apply for DPP, application deadlines, and campus policies regarding the program, contact the Office of Student Business Services, 203 Hahn Student Services Building, (831) 459-2107, e-mail [oarinfo@ucsc.edu](mailto:oarinfo@ucsc.edu), or visit the [Student Business Services web site](#).

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### FINANCIAL AID

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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 Scholarship 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).

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### APPLICATION DEADLINES

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The Free Application for Federal Student Aid (FAFSA) may be submitted online at the [Federal Student Aid web site](#) on or after January 1 preceding the academic year you wish to receive aid. Submit the FAFSA each year before the priority deadline of March 2 to be eligible for all types of aid. A "FAFSA on the Web Worksheet" is available at the same web site to help you prepare for completing the FAFSA.

Students admitted for fall quarter will receive an estimated financial aid award in April.

The Financial Aid and Scholarship Office may require additional documentation from applicants. These applicants will be sent an e-mail 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 our review of documentation.

Applicants who submit verification documents after our 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.

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### TYPES OF AID

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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

## Undergraduate Expenses and Financial Resources

March 2. Cal Grant A and B awards pay Tuition and Student Services Fees at UC and are \$12,240 for 2015-16. Cal Grant B Access awards are \$1,648.

**\*Note:** The passage of California Dream Acts—AB130 and AB131—extended eligibility for certain types of institutional and state aid to students, including undocumented students, who qualify for benefits under another California law—AB540—which exempts students from paying nonresident supplemental tuition. We refer to our students as “Dreamers” and encourage applying for financial aid using the [CA Dream Application](#).

- 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 2015-16 is \$5,775.
- 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 \$3,000.

### 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

- Federal Perkins Loans are offered to first-year 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 of up to 1.068 percent after September 30 in 2015-16, 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 for 2015-16 are fixed at 4.29 percent for undergraduate subsidized loans.

### 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 2015-16 interest rate is fixed at 4.29 percent for undergraduate students. The student pays an origination fee of up to 1.068 percent 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. The 2015-16 interest rate after September 30 is fixed at 6.84 percent. Borrowers pay an origination fee of 4.272 percent that is deducted from the loan amount. Loan repayments begin 60 days after the last disbursement for the academic year (the last disbursement is typically

## Undergraduate Expenses and Financial Resources

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
<b>Dependent Students</b>			
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	
<b>Independent Students<sup>1</sup></b>			
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	
<b>Graduate Students</b>	N/A	\$20,500	\$20,500
Lifetime Loan Limits		\$138,500	
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](#) web site under [Private Loans](#) and are also available at [www.elmselect.com](http://www.elmselect.com).

### Federal Work-Study

Federal Work-Study gives students the opportunity to work part-time to earn money to help cover expenses while enrolled at UC Santa Cruz. Students who demonstrate financial need may be offered Work-Study. Some on-campus and community jobs are posted online at the Career Center web site [Career Center web site](#). 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 web site](#).

### MORE INFORMATION

For more information about applying for financial aid, rights and responsibilities, and document deadlines contact the [Financial Aid and Scholarship Office](#) at (831) 459-2963 or visit us at 205 Hahn Student Services Building.

### VETERAN SERVICES

The Veteran Services staff in the Office of the Registrar acts as a liaison between the Department of Veterans Affairs and students who as veterans, veterans' dependents, or reservists receive education benefits. The staff also assists with the California Department of Veterans Affairs' college fee-waiver program for children of veterans who have service-connected disabilities or who have died from service-related causes. Students who are California residents apply for the college fee-waiver program through their home county Veterans Services Office.

Students who are veterans or veterans' dependents should contact the Veteran Services office at UCSC as soon as they receive notification of admission to UCSC to ensure timely processing of their benefit claims.

## Undergraduate Expenses and Financial Resources

Veteran Services staff members are located at 190 Hahn Student Services Building. For more information, visit the [Veteran Services web site](#), call (831) 459-2709 or (831) 459-2910, or e-mail [vets\\_benefits@ucsc.edu](mailto: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 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 e-mail to [vets@ucsc.edu](mailto:vets@ucsc.edu), or visit the [STARS web site](#).

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# UNDERGRADUATE ACADEMIC PROGRAM

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2015-16 General Catalog

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## PLANNING YOUR ACADEMIC PROGRAM

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### Planning Your Academic Program

At UC Santa Cruz, the academic year is organized on the quarter system. Three quarters—fall, winter, and spring—constitute the regular academic year. Most UCSC courses are equivalent to 5 quarter credits and require approximately equal amounts of work: about 15 hours per week per course. You are normally expected to enroll in 15 credits each quarter; enrolling in a reduced or expanded course load requires special approval. If you maintain a B average at UCSC, you may enroll in more courses without special approval. For specific information on how courses are organized, see [programs and courses](#).

You are normally expected to graduate in four years. To do so, you must pass an average of 45 credits per year, for a total of 180 credits. In order to complete certain majors with extensive course requirements, junior transfer students may need to spend more than two years at UC Santa Cruz.

The requirements for a bachelor's degree are explained in the following section. Your adviser can help you plan a program that fulfills these requirements efficiently while meeting your own educational goals (see Advising: From Course Selection to Careers).

Here is what you can expect during four years at Santa Cruz:

During your freshman year, you complete your college core course and satisfy the Entry Level Writing Requirement. You also begin to take foundation courses for potential majors, along with courses that satisfy 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. You are expected to be declared in a major by the end of your second (sophomore) year; transfer students are expected to be declared in a major by the deadline in their second quarter at UCSC. Students interested in majors requiring heavy course prerequisites, such as music and most majors in the physical and biological sciences and engineering, should be certain they start the

appropriate sequences in the first year; information is available through your major advising office.

During your junior and senior years at Santa Cruz, you concentrate on the upper-division requirements for your major and complete your comprehensive requirement, as well as complete your general education requirements. If you entered UCSC without having fulfilled the requirement in American history and institutions, you will need to do so before you graduate.

Transfer students should complete any lower-division requirements for their intended major that are offered at their current campus and may also find it helpful to complete courses that fulfill campus general education requirements. The Office of Admissions can help you select appropriate courses, and you should also consult with your community college adviser.

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## GRADUATION REQUIREMENTS

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To qualify for a bachelor's degree, you must meet the following conditions, which are explained in more detail in the following sections:

- Earn a minimum of 180 credits, each with a grade of D or better (or Pass)
- Satisfy the university requirements in American history and institutions and in Entry Level Writing (English composition)
- Meet the UCSC residence requirement
- Satisfy each of the campus general education requirements with a course grade of C or better (or Pass)
- Satisfy requirements of your UCSC college
- Complete an approved major program, including its comprehensive requirement, with grades of Pass, C (2.0 grade point average), 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 grade point average (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

## Undergraduate Academic Program

Abroad Program or on 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.

As a UC Santa Cruz student, you are responsible for selecting the 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.

Keep your own records, including not only records of your UCSC courses, grades, and progress, but also your transcripts from other institutions, admission test scores, transfer credit information, and performance evaluations.

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 UCSC Office of Admissions determines which courses are transferable.

### UNIVERSITY REQUIREMENTS

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The UC Santa Cruz campus administers three requirements for graduation from the University of California: (1) American history and institutions, (2) Entry level writing requirement, and (3) UCSC residence. These requirements are described in detail below.

#### American History and Institutions

Every candidate for a bachelor's degree must demonstrate knowledge of American history and institutions. You may fulfill this requirement in one of the following ways:\*

- By achieving a score of 550 or higher on the SAT Subject Examination in U.S. History
- By 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
- By satisfactorily completing a college-level course in U.S. history and institutions
- By certification of completion of the requirement on a transcript from an accredited California institution of higher education
- By completing an acceptable history or government course in high school that satisfies the subject requirement for admission to the university, described in [Subject Requirements](#).

\*Note: Alternatives for satisfying this requirement vary among the campuses of the University of California. If

you plan to transfer to another UC campus, consult its general catalog for information on this point.

#### Entry Level Writing Requirement

Every candidate for a bachelor's degree must demonstrate an acceptable level of ability in English composition. Before your fourth quarter of enrollment, you must fulfill this requirement in one of the following ways:

1. Score 680 or higher on the Writing section of the SAT Reasoning test.
2. Score 30 or higher on the ACT Combined English/Writing test .
3. Score 3 or higher on the College Board Advanced Placement Examination in English (Language or Literature).
4. Score 5 or higher on the International Baccalaureate Higher Level Examination in English: Literature (formerly IB HL English A1).
5. Score 6 or higher on the International Baccalaureate Standard Level Examination in English (Language A).
6. Complete with a grade of C or better an acceptable college course in English composition worth 4 quarter or 3 semester units.
7. Achieve a passing score on the UC Analytical Writing Placement Examination, given in the spring every year (freshmen who are admitted to UC will receive detailed information in April about the exam; nonresidents may take the exam in the fall after enrolling).
8. Complete an appropriate English course at UC with a grade of C or better.

California high school seniors who have been admitted to UCSC must take the systemwide UC Analytical Writing Placement Examination, given in May, unless they have already satisfied the requirement.

#### Residence

Every candidate for a bachelor's degree must be registered at UCSC for a minimum of three terms. In addition, of the final 45 quarter credits, 35 must be in regular courses of instruction that you have taken as a registered student at UCSC (including during the summer session). Courses taken through University Extension or the Intercampus Visitor Program do not constitute regular courses and therefore do not satisfy residence requirements.

The credit requirement for residence is applied differently to students participating in the Education Abroad Program (EAP) and the University of California

## Undergraduate Academic Program

in Washington, D.C. (UCDC), program. Students may satisfy the requirement in either of two ways. The first way is for students to complete 35 of their final 45 credits before leaving the Santa Cruz campus to participate in EAP or UCDC. In this scenario, students do not have to return to Santa Cruz for any additional coursework after they have finished EAP or UCDC. The second way to fulfill the residence requirement is for students to complete 35 of their last 90 credits at the Santa Cruz campus, with a minimum of 12 credits completed at UCSC after their return from EAP or UCDC.

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## GENERAL EDUCATION REQUIREMENTS

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The general education requirements are designed to introduce you to various kinds of information, reasons for learning, and approaches to acquiring knowledge, as well as to 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.

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### GENERAL EDUCATION REQUIREMENTS FOR STUDENTS ENTERING BEGINNING FALL 2010

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Beginning in fall 2010, all new students are required to fulfill a new set of guidelines for general education requirements that were approved by the UCSC Academic Senate in 2009. Students who began prior to fall 2010 and transfer students who entered another collegiate institution prior to that time may opt to change to the new requirements or fulfill the previous general education requirements, if catalog rights allow. See [Catalog Rights](#) for more information. Contact your college adviser if you have questions.

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 associated with it, and only those courses carrying that code satisfy the requirement. The codes appear in the course descriptions in this catalog and in the “General Education” field on the MyUCSC Class Search page. See a list of courses that fulfill General Education requirements. The list is subject to change. Students should check the [Schedule of Classes](#) each quarter for the most up-to-date information. Students following the new general education requirements 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 new general education requirements.

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## COURSES THAT FULFILL GENERAL EDUCATION REQUIREMENTS FOR STUDENTS ENTERING FALL 2010

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### CROSS-CULTURAL ANALYSIS (CC CODE)—ONE COURSE REQUIRED (5 CREDITS)

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One five-credit course or equivalent is required that emphasizes understanding of one or more cultures and societies outside the United States.

**Anthropology** 2, 110G, 110H, 110K, 1100, 110P, 130A, 130B, 130C, 130E, 130F, 130H, 130I, 130J, 130L, 130M, 130T

**Applied Linguistics** 113

**Chinese** 6

**Cowell College** 83, 84, 87

**Education** 170, 171

**Environmental Studies** 154

**Feminist Studies** 1, 10, 40, 80S, 120, 175

**Film and Digital Media** 132A, 132B, 165E, 165G, 168

**French** 4, 5, 6

**German** 4, 5, 6, 119

**History** 2A, 2B, 11A, 11B, 30, 40A, 40B, 41, 50, 62A, 62B, 63, 65A, 70A, 70B, 80H, 80N, 80Y, 101A, 101B, 101C, 105, 106A, 107, 134B, 137A, 137B, 137C, 140B, 140C, 140D, 140E, 147A, 147B, 147C, 150A, 150C, 152, 155, 156, 157, 159A, 159B, 160A, 160C, 163B, 166, 167B, 173A, 173B, 173C, 174, 176, 178C, 181, 181A

**History of Art and Visual Culture** 10, 20, 22, 24, 47, 58, 70, 110, 111, 122A, 122B, 123B, 124A, 124B, 124C,

Undergraduate Academic Program

124D, 127A, 127B, 143C, 160A, 162A, 162B, 172, 179, 180A, 190N, 1910

**Italian** 4, 5, 6, 106

**Japanese** 5, 6

**Languages** 80D

**Latin American and Latino Studies** 30, 50, 60, 80D, 80H, 80I, 80Q, 80S, 80X, 121, 140, 145, 152, 165, 169, 170, 194G, 194I, 194M, 194Q

**Linguistics** 80C

**Literature** 80D

**English-Language Literatures** 160F

**Italian Literature** 150D

**Modern Literary Studies** 125D, 144E

**Pre- and Early Modern Literature** 102, 107A, 107B, 150D

**Spanish/Latin American/Latino Literatures** 102A, 102B, 130A, 130E, 131H, 153

**World Literature and Cultural Studies** 124, 132, 142

**Music** 11D, 80A, 80I, 80P, 80Q, 80S, 80T, 80X, 150I, 180D

**Philosophy** 22

**Politics** 60, 65, 166

**Portuguese** 65A, 65B

**Russian** 4, 5, 6

**Sociology** 15, 162, 188A

**Spanish** 4, 5, 5M, 6, 156A, 156J, 156M

**Spanish for Heritage Speakers** 4, 5, 6

**Theater Arts** 22, 80Z, 122, 151I, 161D

ETHNICITY AND RACE (ER CODE)—ONE COURSE REQUIRED (5 CREDITS)

One five-credit course or equivalent is required that focuses on issues of ethnicity and/or race.

**Anthropology** 110T, 130N, 159, 176D

**Art** 80F

**Critical Race and Ethnic Studies** 10, 100

**Education** 128, 140, 177, 181

**Environmental Studies** 147

**Feminist Studies** 20, 115, 139, 145, 150

**Film and Digital Media** 165B, 165D

**History** 9, 10A, 10B, 12, 14, 74, 75, 80X, 104D, 106B, 109A, 110A, 110H, 111, 115A, 115B, 116, 120, 121A, 121B, 123, 125, 126, 128, 134A, 178E

**History of Art and Visual Culture** 46, 60, 80, 140B, 140C, 140D, 163, 170, 190J, 190X, 191C

**Latin American and Latino Studies** 1, 20, 40, 45, 80F, 80J, 100, 112, 132, 143, 150, 161P, 166, 175, 178, 194C

**Literature** 61J, 61R, 80L, 80N

**English-Language Literatures** 150A, 150C, 150F, 180D

**Modern Literary Studies** 144A, 144D, 144H

**Spanish/Latin American/Latino Literatures** 105

**World Literature and Cultural Studies** 127, 129

**Music** 80E

**Sociology** 156

**Spanish** 105, 156G

**Theater Arts** 80A, 80M, 151A, 161P, 166

INTERPRETING ARTS AND MEDIA (IM CODE)—ONE COURSE REQUIRED (5 CREDITS)

One five-credit course or equivalent is required that focuses on the practice, analysis, interpretation, and/or history of one or more artistic or mass media (media in which non-textual materials play primary roles).

**Anthropology** 110A, 110B, 110R, 120, 132

**Art** 10D, 10E, 10F, 80D, 80E, 147T

**Art and Design: Games and PlayableMedia** 80G

**Computational Media** 80K

**Cowell College** 65

**Crown College** 60

**Education** 102, 120

**Feminist Studies** 14, 16, 21, 126

**Film and Digital Media** 80A, 80M, 80S, 80X, 130, 134A, 134B, 136A, 136B, 136D, 160, 162, 165C

**French** 108

**History** 104C, 122A, 122B

**History of Art and Visual Culture** 7, 27, 30, 31, 40, 41, 43, 45, 50, 51, 117, 122D, 127C, 127E, 133A, 135B, 135D, 135E, 135H, 135P, 137B, 137C, 137D, 137E, 140A, 140P, 141A, 141B, 141C, 141E, 141F, 141H, 141I, 141J, 141K, 143A, 143B, 143D, 151, 154, 155, 160B, 190C, 191P, 191S

**Latin American and Latino Studies** 70, 124, 128, 129, 176

**Literature** 61H

**German Literature** 161

**Modern Literary Studies** 125J, 125N, 168E

**Pre- and Early Modern Literature** 137

**Spanish/Latin American/Latino Literatures** 135F

**Music** 7, 11A, 80G, 80M, 80N, 80O, 80V, 80Y, 150C, 150P, 150T, 150X

**Oakes College** 128

**Theater Arts** 10, 20, 31P, 40, 80D, 80L, 80N, 80P, 80Q, 108, 113, 116A, 117, 130, 131P, 165

MATHEMATICAL AND FORMAL REASONING (MF CODE)—ONE COURSE REQUIRED (5 CREDITS)

One five-credit course or equivalent is required that emphasizes university-level mathematics, computer programming, formal logic, or other material that stresses formal reasoning, formal model building, or application of formal systems.

**Applied Mathematics and Statistics** 3, 6, 10, 11A, 11B, 15A, 15B, 20, 114, 147

## Undergraduate Academic Program

### Art 101

**Astronomy and Astrophysics** 2, 3, 4, 5, 12, 13, 15, 16

**Biomolecular Engineering** 160

**College Eight** 81B

**Computer Engineering** 8, 16

**Computer Science** 5C, 5J, 5P, 10, 11, 12B

**Earth and Planetary Sciences** 11, 81B

**Economics** 11A, 11B

**Mathematics** 3, 11A, 11B, 19A, 19B, 20A, 20B, 21, 22, 23A, 23B, 100

**Music** 80L, 130

**Philosophy** 9

**Physics** 5A, 6A

SCIENTIFIC INQUIRY (SI CODE)—ONE COURSE  
REQUIRED (5 CREDITS)

One five-credit course or equivalent is required that focuses on the essential roles of observation, hypothesis, experimentation and measurement in the sciences.

**Anthropology** 1, 3

**Astronomy and Astrophysics** 1, 6

**Biology: Molecular, Cell, and Developmental** 80A, 80E, 80J

**Chemistry and Biochemistry** 1A

**College Eight** 81C

**Crown College** 84H

**Earth and Planetary Sciences** 2, 3, 5, 7, 8, 10, 20, 65

**Electrical Engineering** 80T, 81C

**Environmental Studies** 24

**History** 101D

**Linguistics** 50

**Microbiology and Environmental Toxicology** 80E

**Ocean Sciences** 1, 80A

**Physics** 1, 5B, 5C, 6B, 6C

**Psychology** 150

STATISTICAL REASONING (SR CODE)—ONE  
COURSE REQUIRED (5 CREDITS)

One five-credit course or equivalent is required that focuses on developing skills in approaching quantitative data and statistical reasoning.

**Applied Mathematics and Statistics** 5, 7, 80A, 80B, 131, 132

**Biology: Ecology and Evolutionary** 80S

**Computer Engineering** 7, 107, 145

**Computer Science** 17, 80L

**Earth and Planetary Sciences** 12, 125

**Economics** 113

**Electrical Engineering** 80S

**Linguistics** 147, 157

**Mathematics** 4

**Ocean Sciences** 90

**Philosophy** 8

**Physics** 133

**Psychology** 2

**Sociology** 103A

TEXTUAL ANALYSIS AND INTERPRETATION (TA  
CODE)—ONE COURSE REQUIRED (5 CREDITS)

One five-credit course or equivalent is required that has as its primary methodology the interpretation or analysis of texts.

**Biology: Molecular, Cell, and Developmental** 114, 126, 127

**Chinese** 103, 104, 105, 107, 108

**College Eight** 80A, 80B, 80C

**Crown College** 80F

**History** 13, 100

**History of Consciousness** 12, 112, 115

**Japanese** 105

**Kresge College** 16

**Latin American and Latino Studies** 131, 144, 180

**Linguistics** 108

**Literature** 1, 61F, 61K, 61M, 61P, 80E, 80V, 80Z, 102

**English-Language Literatures** 102A, 103E, 110A, 110F, 120A, 120B, 120H, 120L, 170A, 170C, 170F, 180B, 180H, 180K, 180M, 180V

**Latin Literature** 100

**Italian Literature** 161

**Modern Literary Studies** 145A, 145B, 167K

**Pre- and Early Modern Literature** 134, 144B, 183

**Spanish/Latin American/Latino Literatures** 60

**World Literature and Cultural Studies** 109, 115A

**Mathematics** 181

**Philosophy** 11

**Politics** 4, 10, 20

**Sociology** 164

**Spanish** 156F

**Stevenson College** 23, 81A, 81B

**Theater Arts** 61A, 61B, 61C, 80K, 80X, 163H, 163K

PERSPECTIVES (5 CREDITS)

Choose one five-credit course or equivalent from any of the three following categories: PE-E, PE-H, PE-T.

ENVIRONMENTAL AWARENESS (PE-E CODE)

Courses focus on humankind's interactions with nature.

**Anthropology** 110E, 110W, 146

**Art** 80B

**Biology: Ecology and Evolutionary** 85

**Biomolecular Engineering** 123B

**College Ten** 105

**Community Studies** 149

**Crown College** 80L

**Earth and Planetary Sciences** 1, 9, 110A

**Electrical Engineering** 80J, 180J

## Undergraduate Academic Program

**Environmental Studies** 25, 65, 80A, 80B, 125, 146  
**History** 177  
**History of Art and Visual Culture** 44, 116, 142, 143G  
**Latin American and Latino Studies** 80P, 164  
**Music** 80K  
**Ocean Sciences** 80B  
**Physics** 2  
**Sociology** 125, 173

### HUMAN BEHAVIOR (PE-H CODE)

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Courses focus on aspects of individual human behavior or the operation of human groups.

**Applied Linguistics** 80  
**Art and Design: Games and Playable Media** 80I  
**Community Studies** 156  
**Cowell College** 138A  
**Economics** 1, 2  
**Latin American and Latino Studies** 149, 159, 174, 194F  
**Politics** 1, 70  
**Psychology** 1  
**Sociology** 136, 137, 159, 172  
**Technology and Information Management** 115  
**Theater Arts** 80C

### TECHNOLOGY AND SOCIETY (PE-T CODE)

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Courses emphasize issues raised by the prevalence of technology in society.

**Art and Design: Games and Playable Media** 80H  
**Biomolecular Engineering** 5, 80G, 80H  
**Computer Engineering** 80A, 80E, 80N  
**Computer Science** 2, 80J, 80S, 119  
**Crown College** 80J  
**Environmental Studies** 176  
**Feminist Studies** 30, 124, 133  
**Film and Digital Media** 80T, 80V, 136C  
**History of Art and Visual Culture** 140E, 143E  
**World Literature and Cultural Studies** 105  
**Music** 80C  
**Philosophy** 80G  
**Sociology** 115  
**Stevenson College** 90  
**Theater Arts** 80T

### PRACTICE (MINIMUM 2 CREDITS)

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Choose one minimum two-credit course from any of the three following categories: PR-E, PR-C, PR-S

### COLLABORATIVE ENDEAVOR (PR-E CODE)

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Courses provide significant experience with collaboration on a project.

**Anthropology** 179, 189  
**Art and Design: Games and Playable Media** 120  
**Biology: Molecular, Cell, and Developmental** 188

**Biomolecular Engineering** 88A, 123A, 180  
**College Nine** 120  
**College Ten** 120  
**Computational Media** 120  
**Computer Engineering** 123A, 129B  
**Computer Science** 116, 183  
**Earth and Planetary Sciences** 109L, 110L, 188A  
**Electrical Engineering** 123A, 129B  
**Environmental Studies** 100L  
**Film and Digital Media** 151, 185X  
**History** 158C  
**Kresge College** 72, 73, 74, 172, 173, 174  
**Linguistics** 144  
**Mathematics** 101  
**Music** 1C, 2  
**Physics** 180  
**Porter College** 22A, 100  
**Psychology** 182  
**Technology and Information Management** 20, 21  
**Theater Arts** 139

### CREATIVE PROCESS (PR-C CODE)

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Courses teach creative process and techniques in the arts (including creative writing), at an individual or a collaborative level.

**Anthropology** 81A, 81B, 81C, 82, 154  
**Art** 20G, 20H, 20I, 20J, 20K, 121  
**Art and Design: Games and Playable Media** 179  
**Computational Media** 25, 26, 178, 179  
**Computer Science** 80V  
**Film and Digital Media** 20P, 150, 170A, 170B, 171C  
**Kresge College** 90A  
**Latin American and Latino Studies** 81A, 81B, 81C  
**Literature** 61L  
**Creative Writing** 10, 52, 53, 170, 180  
**Music** 9, 10, 80Z, 127, 163, 166  
**Porter College** 20F, 21C, 22C, 22H, 23B, 34B, 39, 80F, 80I, 90A  
**Theater Arts** 14, 15, 17, 19, 30, 36, 37, 114, 115A, 115B, 119, 128, 136, 153

### SERVICE LEARNING (PR-S CODE)

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Courses provide the opportunity for supervised campus or community service that contributes to a student's overall education.

**Biology: Ecology and Evolutionary** 95  
**Biology: Molecular, Cell, and Developmental** 191  
**Chemistry and Biochemistry** 182  
**College Eight** 55, 155, 162  
**College Ten** 98, 110, 110B  
**Community Studies** 191, 198  
**Cowell College** 168, 184A, 184B, 184C  
**Crown College** 70

Undergraduate Academic Program

**Education** 50A, 50B, 50C, 180  
**Environmental Studies** 83, 184  
**History of Art and Visual Culture** 193F  
**Kresge College** 12A, 12B, 12C, 62  
**Literature** 191  
**Mathematics** 188, 189  
**Merrill College** 85B, 85C, 90, 90F  
**Oakes College** 73B, 151B, 152, 153  
**Porter College** 13C, 83  
**Psychology** 155, 193, 193A, 193B, 193C, 193D  
**Writing** 169

COMPOSITION (C1 AND C2 CODE) (10 CREDITS)  
TWO FIVE-CREDIT COURSES.

C1

College Eight 80A, 80D  
College Nine 80A, 80D  
College Ten 80A, 80D  
Cowell College 80A  
Crown College 80A  
Kresge College 80A, 80D  
Merrill College 80A  
Oakes College 80A, 80D  
Porter College 80A  
Stevenson College 80A

C2

College Eight 80B  
College Nine 80B  
College Ten 80B  
Cowell College 80B  
Crown College 80B  
Kresge College 80B  
Merrill College 80B  
Oakes College 80B  
Porter College 80B  
Stevenson College 80B, 81B  
Writing 2

DISCIPLINARY COMMUNICATION (DC CODE)

Students satisfy the DC Requirement by completing 1-3 upper-division courses required for their major totaling a minimum of five credits.

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COURSES THAT FULFILL GENERAL  
EDUCATION REQUIREMENTS FOR  
STUDENTS ENTERING PRIOR TO FALL  
2010

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Refer to the course listings in the Class Search in MyUCSC to identify general education courses offered.

INTRODUCTIONS TO DISCIPLINES, HUMANITIES,  
AND ARTS (IH CODE)—TWO COURSES FROM  
DIFFERENT DEPARTMENTS REQUIRED (10  
CREDITS)

Only one IH requirement may be satisfied with a course (equivalent to 5 credits) from the Arts Division (art, film and digital media, history of art and visual culture, music, theater arts); only one language course may be used to satisfy an IH requirement; and only one literature course may be used to satisfy an IH requirement. Note: Transfer courses designated IH from English departments are considered to be literature courses for general education purposes.

**Chinese** 4, 5, 6, 107, 108  
**Cowell College** 118B  
**Crown College** 60  
**Feminist Studies** 1  
**French** 4, 5, 6  
**German** 4, 5, 6  
**Hebrew** 4, 5, 6  
**History** 2A, 2B, 10A, 10B, 11A, 11B, 13, 14, 30, 40A, 40B, 41, 62A, 62B, 65A, 70A, 70B  
**History of Art and Visual Culture** 20, 24, 30, 31, 43, 80  
**History of Consciousness** 12  
**Italian** 4, 5, 6  
**Japanese** 4, 5, 6  
**Linguistics** 50, 53, 111, 112  
**Literature** 1, 61F, 61H, 61J, 61M, 61P, 61R, 61W  
**Greek Literature** 100  
**Latin Literature** 100  
**Spanish/Latin American/Latino Literatures** 60  
**Music** 11A, 11B, 11C, 11D  
**Philosophy** 9, 11, 22  
**Portuguese** 60B, 65A, 65B  
**Russian** 4, 5, 6  
**Spanish** 4, 5, 5M, 6  
**Spanish for Heritage Speakers** 4, 5, 6  
**Theater Arts** 10, 19, 20, 30, 33C, 36, 40, 61A, 61B, 61C, 122

INTRODUCTIONS TO DISCIPLINES, NATURAL  
SCIENCES AND ENGINEERING (IN CODE)—TWO  
COURSES FROM DIFFERENT DEPARTMENTS  
REQUIRED (10 CREDITS)

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## Undergraduate Academic Program

Transfer courses designated IN from anatomy, botany, physiology, and zoology departments are considered to be biology courses.

### **Anthropology 1**

**Applied Mathematics and Statistics** 5, 7, 11A, 11B, 15A, 15B

**Astronomy and Astrophysics** 1, 2, 3, 4, 5, 12, 13, 15, 16, 18, 119

**Biology: Molecular, Cell, and Developmental** 20A  
**Biomolecular Engineering** 5

**Chemistry and Biochemistry** 1A, 1B, 1C

**College Eight** 81B

**Computer Engineering** 3, 8, 12

**Computational Media** 120

**Computer Science** 2, 5C, 5J, 5P, 10, 12A, 12B, 13H

**Earth and Planetary Sciences** 1, 3, 5, 7, 10, 20, 65, 81B, 119

**Economics** 11A, 11B

**Environmental Studies** 23, 24

**Mathematics** 11A, 11B, 19A, 19B, 20A, 20B

**Ocean Sciences** 1

**Physics** 1, 5A, 5B, 5C, 6A, 6B, 6C

INTRODUCTION TO DISCIPLINES, SOCIAL SCIENCES (IS CODE)—TWO COURSES FROM DIFFERENT DEPARTMENTS REQUIRED (10 CREDITS)

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**Anthropology** 2, 3

**Community Studies** 10

**Economics** 1, 2

**Education** 60

**Environmental Studies** 25

**Latin American and Latino Studies** 1

**Legal Studies** 10

**Politics** 1, 3, 4, 17, 20, 60, 70

**Psychology** 1, 65

**Sociology** 1, 10, 15

TOPICAL COURSES (T CODE)—THREE COURSES REQUIRED (15 CREDITS)

Students entering UCSC with fewer than 45 transferable credits must take three topical courses in residence at UCSC. UCSC Summer Session courses can be used to satisfy topical requirements.

Choose one course from each academic area: natural sciences (2), social sciences (3), and humanities and arts (4). Courses labeled 5, 6, and 7 satisfy topical requirements in two different academic areas; students can apply this kind of topical course to either academic area indicated. The three topical course requirements must be satisfied with three different courses. In the Schedule of Classes, courses that carry a T general education code are listed as follows:

**2-Natural Sciences Area**

**3-Social Sciences Area**

**4-Humanities and Arts Area**

**5-Humanities and Arts or Social Sciences Area**

**6-Natural Sciences or Humanities and Arts Area**

**7-Natural Sciences or Social Sciences Area**

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T2-NATURAL SCIENCES

**Astronomy and Astrophysics** 6

**Biology: Molecular, Cell, and Developmental** 80A, 80E, 80J

**Biomolecular Engineering** 80H

**College Eight** 81C

**Computational Media** 80K

**Computer Engineering** 80H, 80N, 80U

**Computer Science** 80B, 80G, 80V

**Crown College** 80S

**Earth and Planetary Sciences** 2, 8, 9, 11, 12

**Electrical Engineering** 80J, 81C

**Microbiology and Environmental Toxicology** 80E

**Ocean Sciences** 80A, 80B

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T3-SOCIAL SCIENCES

**College Eight** 80A, 80B

**College Nine** 80A, 80B

**College Ten** 80A, 80B

**Economics** 80A, 80G, 80H

**History** 80X

**Latin American and Latino Studies** 30, 40, 45, 80D, 80F, 80H, 80I, 80J, 80P, 80Q, 80R, 80S

**Merrill College** 80A, 80B

**Psychology** 80A

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T4-HUMANITIES AND ARTS

**Art** 80D, 80E

**Cowell College** 80A, 80B

**Feminist Studies** 80S

**Hebrew** 80

**History** 80H, 80N, 80Y

**History of Consciousness** 80U

**Languages** 80D

**Latin American and Latino Studies** 80E

**Linguistics** 80V

**Literature** 80I, 80L, 80N, 80V, 80Z

**Music** 80A, 80F, 80G, 80H, 80I, 80J, 80M, 80N, 80O, 80P, 80Q, 80S, 80T, 80V, 80W, 80X

**Oakes College** 80H

**Philosophy** 80E

**Porter College** 80A, 80B, 80E, 80I, 80W

**Stevenson College** 80H

**Theater Arts** 80A, 80B, 80D, 80H, 80K, 80L, 80M, 80N, 80P, 80Q, 80S, 80V, 80X, 80Y, 80Z

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T5-HUMANITIES AND ARTS OR SOCIAL SCIENCES

Undergraduate Academic Program

**Crown College** 80J  
**Feminist Studies** 10, 20, 30, 40  
**Film and Digital Media** 80S, 80T, 80X  
**Kresge College** 80A, 80B, 80H, 80T  
**Latin American and Latino Studies** 80X  
**Linguistics** 80C, 80D  
**Merrill College** 80C  
**Oakes College** 80A, 80B  
**Philosophy** 80M  
**Porter College** 80L  
**Stevenson College** 80A, 80B, 80T

T6–NATURAL SCIENCES OR HUMANITIES AND ARTS

**Art** 80F  
**Biomolecular Engineering** 80G  
**Computer Engineering** 80E  
**Crown College** 80A, 80B  
**Music** 80C, 80L, 80R  
**Philosophy** 80G, 80S  
**Porter College** 80K

T7–NATURAL SCIENCES OR SOCIAL SCIENCES

**Applied Mathematics and Statistics** 80A  
**Computer Engineering** 80A  
**Computer Science** 80J, 80S  
**Crown College** 80F, 80L  
**Electrical Engineering** 80S, 80T  
**Environmental Studies** 80A, 80B  
**Technology and Information Management** 80C

COMPOSITION COURSES (C1 AND C2 CODE)—ONE COURSE EACH REQUIRED FOR STUDENTS ENTERING FALL 2005 (5 CREDITS)

C1

**College Eight** 80A, 80D  
**College Nine** 80A, 80D  
**College Ten** 80A, 80D  
**Cowell College** 80A  
**Crown College** 80A  
**Kresge College** 80A, 80D  
**Merrill College** 80A  
**Oakes College** 80A, 80D  
**Porter College** 80A  
**Stevenson College** 80A

C2

**College Eight** 80B  
**College Nine** 80B  
**College Ten** 80B  
**Cowell College** 80B  
**Crown College** 80B  
**Kresge College** 80B  
**Merrill College** 80B

**Oakes College** 80B  
**Porter College** 80B  
**Stevenson College** 80B, 81B  
**Writing 2**

WRITING-INTENSIVE COURSES (W CODE)—ONE COURSE REQUIRED (5 CREDITS)

**Anthropology** 150, 152, 170, 172, 194A, 194B, 194C, 194D, 194E, 194F, 194G, 194H, 194I, 194K, 194L, 194M, 194N, 194O, 194P, 194Q, 194R, 194S, 194T, 194U, 194V, 194W, 194X, 194Y, 194Z, 196C, 196D, 196E, 196F, 196G, 196H, 196I  
**Applied Mathematics and Statistics** 156  
**Art** 149A, 149B, 150C, 190A  
**Biochemistry and Molecular Biology** 110L  
**Biology: Ecology and Evolutionary** 141L, 145L, 150L, 151B, 158L, 159A, 161L, 188  
**Biology: Molecular, Cell, and Developmental** 100L, 105L, 105M, 109L, 110L, 115L, 186L  
**Chemistry and Biochemistry** 122  
**Community Studies** 194  
**Computer Engineering** 185  
**Computer Science** 166B  
**Earth and Planetary Sciences** 195  
**Economics** 142, 165, 166B, 184, 195  
**Environmental Studies** 104A, 109B, 156, 157, 172  
**Feminist Studies** 194I, 194N, 195  
**Film and Digital Media** 150, 196B  
**History** 190A, 190B, 190C, 190E, 190F, 190G, 190H, 190I, 190K, 190L, 190M, 190N, 190O, 190P, 190Q, 190R, 190S, 190T, 190U, 190W, 190X, 190Y, 190Z, 194A, 194B, 194E, 194G, 194H, 194M, 194N, 194P, 194Q, 194R, 194U, 194Y, 195B, 196C, 196D, 196E, 196F, 196G, 196H, 196I, 196J, 196K, 196M, 196N, 196O, 196P, 196Q, 196R, 196S, 196U, 196V, 196W, 196Y, 196Z  
**History of Art and Visual Culture** 100A  
**Kresge College** 80T  
**Latin American and Latino Studies** 194H  
**Legal Studies** 196  
**Linguistics** 101, 113, 114A  
**Literature** 1, 61W, 101  
**Microbiology and Environmental Toxicology** 119L, 151  
**Philosophy** 127  
**Physics** 182  
**Porter College** 80W  
**Psychology** 110, 119A, 119H, 119M  
**Science Communication** 160  
**Sociology** 103B, 134, 195C  
**Stevenson College** 80T  
**Technology and Information Management** 158  
**Theater Arts** 157, 159

## Undergraduate Academic Program

**Writing** 64, 101, 102, 103, 104, 110A, 161, 163, 165, 166A, 166B, 166D, 167

**QUANTITATIVE COURSES (Q CODE)—ONE COURSE REQUIRED (5 CREDITS)**

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**Applied Mathematics and Statistics** 3, 5, 6, 7, 10, 11A, 11B, 15A, 15B, 80A, 131

**Astronomy and Astrophysics** 2, 3, 4, 5, 12, 13, 15, 16, 18

**Chemistry and Biochemistry** 1A, 1B, 1C

**College Eight** 81B

**Computer Engineering** 8, 12, 16

**Computer Science** 80B

**Earth and Planetary Sciences** 11, 12, 81B, 111

**Economics** 11A, 11B, 113

**Electrical Engineering** 80T

**Mathematics** 3, 4, 11A, 11B, 19A, 19B, 20A, 20B, 21, 110

**Ocean Sciences** 1

**Philosophy** 8, 9

**Physics** 1, 5A, 6A

**Psychology** 2, 181

**Sociology** 103A, 103B

**ARTS COURSES (A CODE)—ONE COURSE OR EQUIVALENT REQUIRED (5 CREDITS)**

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Courses carrying fewer than five credits may be combined for credit toward satisfaction of the A requirement if they total at least five credits. Some two-credit music courses must be taken in sequence to fulfill the A requirement.

**Anthropology** 81A, 81B, 81C

**Art** 80D, 80E, 80F, 121, 146T, 147T, 194

**Cowell College** 70A, 70B, 70C, 161Y

**Feminist Studies** 80S, 123

**Film and Digital Media** 80S, 80T, 80X, 132A, 132B, 136A, 136B, 151, 160, 165A, 170A, 170B, 176, 185D

**History of Art and Visual Culture** 20, 22, 24, 27, 30, 31, 40, 41, 43, 50, 51, 58, 60, 70, 100A, 110, 111, 115, 117, 118, 122A, 122B, 122C, 122D, 123A, 123B, 124C, 127A, 127B, 127C, 127D, 133A, 135B, 135D, 135E, 137A, 137B, 137C, 137D, 137E, 140A, 140B, 140C, 140D, 141A, 141B, 141E, 141F, 141H, 141I, 141K, 143A, 143C, 143F, 151, 154, 160A, 160B, 162A, 170, 172, 190A, 190B, 190C, 190D, 190E, 190F, 190G, 190J, 190M, 190O, 190P, 190Q, 190U, 190V, 190W, 190X, 191A, 191B, 191C, 191D, 191E, 191F

**Kresge College** 80H

**Latin American and Latino Studies** 81A, 81B, 81C, 161P, 171

**Literature/Creative Writing** 10, 52, 53, 170, 180, 183

**Music** 1A, 5A, 5B, 5C, 6, 10, 11A, 11B, 11C, 11D, 51, 54,

75, 80A, 80C, 80F, 80G, 80H, 80I, 80J, 80L, 80M, 80N, 80O, 80P, 80Q, 80R, 80S, 80V, 80W, 80X, 102, 103, 159A, 160, 180A, 180B

**Music Sequence Courses** 1C-1C-1C, 2-2-2, 3-3-3, 4A-4A-4A, 4B-4B-4B, 4A-4A-4B, 4A-4B-4B, 8-8-8, 9-9-9, 166-166-166

**Philosophy** 152

**Porter College** 14, 20A, 20C, 20D, 21A, 21C, 22, 22A, 22C, 22F, 22G, 23A, 23B, 23C, 28, 32A, 33, 33A, 34B, 35, 38B, 39, 80E, 80G, 80I, 80L, 83, 120, 121, 121C

**Theater Arts** 10, 12, 14, 15, 17, 18, 18C, 19, 20, 21A, 21B, 22, 23, 30, 31P, 33C, 36, 37, 40, 52, 61A, 61B, 61C, 80A, 80B, 80D, 80H, 80K, 80L, 80M, 80N, 80P, 80Q, 80S, 80V, 80X, 80Y, 80Z, 100A, 100B, 100C, 100W, 104, 106, 113, 114, 115A, 115B, 116A, 117, 117A, 118, 119, 121, 122, 124, 126, 128, 130, 131, 131C, 131P, 135, 136, 137, 139, 142, 151, 152, 155, 157, 159, 160, 161A, 161C, 161D, 161M, 161P, 161Q, 161R, 161S, 161T, 161U, 161Y, 163A, 163E, 163G, 164, 165, 166, 193, 193F

**U.S. ETHNIC MINORITIES/NON-WESTERN SOCIETY COURSES (E CODE)—ONE COURSE REQUIRED (5 CREDITS)**

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**Anthropology** 110G, 110O, 110P, 130A, 130B, 130C, 130E, 130F, 130G, 130H, 130I, 130L, 130M, 130N, 130T

**Community Studies** 141, 151

**Computer Science** 80S

**Economics** 120, 128

**Education** 60, 128, 140, 141, 164, 181

**Environmental Studies** 154

**Feminist Studies** 10, 102, 115, 120, 123, 124, 132, 139, 145, 150, 175, 194F

**Film and Digital Media** 165B, 165D, 165E, 165G

**History** 11A, 11B, 14, 30, 40A, 40B, 41, 75, 80H, 80X, 80Y, 101A, 101B, 104C, 104D, 106A, 106B, 109A, 111, 121A, 121B, 126, 128, 130, 134A, 134B, 137A, 137B, 137C, 140C, 140D, 141A, 141B, 145, 147A, 147B, 150C, 155, 181A, 185D, 190A, 190B, 190E, 190L, 190N, 190O, 190R, 194G, 194H, 194N, 194U, 194Y, 196N

**History of Art and Visual Culture** 22, 24, 27, 58, 60, 70, 80, 110, 111, 115, 117, 122B, 123A, 123B, 127C, 127D, 135E, 140C, 140D, 141K, 143C, 170, 172, 190A, 190B, 190J, 190M, 190W, 190X, 191A, 191B, 191C

**History of Consciousness** 118

**Latin American and Latino Studies** 1, 30, 40, 45, 80D, 80E, 80F, 80H, 80I, 80J, 80P, 80Q, 80R, 80S, 80X, 100, 100A, 100B, 101, 111, 122, 128, 129, 140, 143, 144, 145, 152, 159, 161P, 164, 166, 168, 169, 170, 175, 176, 178, 180, 194F, 194G, 194H, 194M, 194R

**Legal Studies** 121, 128, 135, 136

**Literature** 61J, 61R, 80L, 80N

**English-Language Literatures** 150A, 150C, 150E, 150F

Undergraduate Academic Program

**French Literature** 134  
**Modern Literary Studies** 125D, 144A, 144D, 144G, 146, 180A  
**Spanish/Latin American/Latino Literatures** 60, 102B, 130A, 130D, 130E, 131H, 134B, 134L, 134M, 134N, 135C, 135E  
**World Literature and Cultural Studies** 109, 117, 123, 124, 127, 135, 136, 140, 190A, 190B  
**Merrill College** 80A, 80B  
**Music** 11B, 11D, 80A, 80F, 80I, 80P, 80Q, 80X, 180A, 180B  
**Oakes College** 80A, 80B, 80H, 128  
**Philosophy** 80E  
**Politics** 121, 140C, 140D, 141, 146  
**Psychology** 110, 142  
**Sociology** 15, 133, 156, 159, 169, 170, 174  
**Spanish** 156A  
**Stevenson College** 80H, 80T, 81A, 81B  
**Theater Arts** 22, 80A, 80M, 100A, 100B, 100W, 161D, 161P, 161R

Service Learning		
Composition	<b>C1 &amp; C2</b>	10
<a href="#">Disciplinary Communication</a>	<b>DC</b>	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 and must be taken at UCSC. The DC requirement must be completed at UCSC—transfer courses do not apply to this requirement.		

**Cross-Cultural Analysis (CC code: one 5-credit course or equivalent).** Courses in cross-cultural analysis prepare students for a world with increased interaction and integration among peoples, companies, and governments. These courses encourage a broader and deeper understanding of cultures and societies outside the United States. Such courses might focus on an in-depth examination of one culture, or one aspect of such culture (for example, art, music, history, language). Alternatively, these courses help students develop skills of cross-cultural comparison and analysis. A third option comprises 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 sensitivity necessary for cross-cultural understanding.

**Ethnicity and Race (ER code: one 5-credit course or equivalent).** Courses in Ethnicity and race 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): how categories of ethnicity and race are constructed; the role they can play in identity formation; how ethnicity and race have historically been used to justify forms of enforced inequality; and the contributions of people of various ethnicities to society and to political change. 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.

**Interpreting Arts and Media (IM code: one 5-credit course or equivalent).** Interpreting Arts and Media courses explore the complex ways in which

General Education Requirements Beginning in Fall 2010		
Category	General Education Code	Number of Required Credits
<b>Cross-Cultural Analysis</b>	<b>CC</b>	5
<b>Ethnicity and Race</b>	<b>ER</b>	5
<b>Interpreting Arts and Media</b>	<b>IM</b>	5
<b>Mathematical and Formal Reasoning</b>	<b>MF</b>	5
Scientific Inquiry	<b>SI</b>	5
Statistical Reasoning	<b>SR</b>	5
Textual Analysis	<b>TA</b>	5
Perspectives (choose one from the following three categories) Environmental Awareness Human Behavior Technology and Society	PE-E PE-H PE-T	5
Practice (choose one from the following three categories) Collaborative Endeavor Creative Process	<b>PR-E</b> <b>PR-C</b> <b>PR-S</b>	2

## Undergraduate Academic Program

information of all kinds is represented by visual, auditory, or kinesthetic means, or through performance. These courses build in-depth understanding of one or more forms of artistic media: that is, media in which nontextual 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 they encode and convey information.

**Mathematical and Formal Reasoning (MF code: one 5-credit course or equivalent).** In a world in which much thinking and discourse is directed by emotion and association, formal or mathematical models teach the value of dispassionate analysis. Mathematical and formal-reasoning courses emphasize the development of mathematical, logical, and/or formal reasoning skills. Mathematics-based courses that satisfy this requirement are focused on teaching significant problem-solving skills, and are often oriented toward particular application areas. Other courses that satisfy this requirement train students in formal reasoning skills and/or in the construction and use of formal models. Formal reasoning domains include mathematical proof, logic, and applied logic. Some examples of formal models are: computer programming languages, generative grammars (from linguistics), supply and demand models, and formal music theory.

**Scientific Inquiry (SI code: one 5-credit course or equivalent).** Courses in Scientific Inquiry teach students about the essential role of observation, hypothesis, experimentation and measurement in the physical, social, life, or technological sciences. In these courses, students acquire key concepts, facts, and theories relevant to the scientific method. By the end of the course students should be able to articulate an understanding of the value of scientific thinking in relation to issues of societal importance.

**Statistical Reasoning (SR code: one 5-credit course or equivalent).** In today's globalized, media-saturated information society, we are continually presented with—or asked to present—numerical data. Statistical-reasoning courses prepare students to interpret quantitative claims and make judgments in situations of statistical uncertainty. The goal of statistical-reasoning courses is to teach skills for effective reasoning about probability and the use of quantitative information. Students acquire an understanding of making informed decisions in the presence of uncertainty. Topics addressed in statistical-reasoning courses include ways of (mis)representing data; correlation vs. causation; statistical inferences;

experimental design and data analysis; understanding orders of magnitude.

**Textual Analysis and Interpretation (TA code: one 5-credit course or equivalent).** Even in our current multimedia world, the written word remains a major vehicle of communication. Many fields, from literature and history to law, government, science and religion, depend heavily on the understanding and interpretation of written documents. Textual analysis and interpretation courses 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.

**Perspectives (one 5-credit course or equivalent from any of the three following categories):**

**Perspectives: Environmental Awareness (PE-E code).** The interactions between people and the earth's environments are subtle, complex, and influenced by a variety of natural, scientific, economic, cultural, and political factors. Courses satisfying the environmental-awareness requirement teach students about the complexity of particular ecosystems and/or people's interactions with nature so that they will better understand the environmental issues and trade-offs that are likely to arise in their lifetimes.

**Perspectives: Human Behavior (PE-H code).** Courses in human behavior 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).

**Perspectives: Technology and Society (PE-T code).** 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. Technology and society courses focus on understanding technological advances, how they are developed, and their impacts on society.

**Practice (one minimum 2-credit course from any of the three following categories):**

## Undergraduate Academic Program

### Practice: Collaborative Endeavor (PR-E code).

Students learn and practice strategies and techniques for working effectively in pairs or larger 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 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.

**Practice: Creative Process (PR-C code).** Creative-process courses teach creative process and techniques in a context of individual or collaborative participation in the arts, including creative writing. 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.

**Practice: Service Learning (PR-S code).** Service-learning courses provide students with an opportunity to integrate their academic coursework with community involvement. Such courses provide supervised learning experiences in which students reflect on, communicate, and integrate principles and theories from the classroom in real-world settings. Students gain valuable practical skills, while giving back to the community.

**Composition (C1 and C2 codes) (Two 5-credit courses or equivalent):** C1 and C2 typically are fulfilled by your college core course and Writing 2, Rhetoric and Inquiry. Students must complete the Entry Level Writing Requirement to satisfy the composition requirements.

**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. Students satisfy the DC requirement by completing 1 to 3 upper-division courses required for their major, totaling a minimum of 5 credits. The DC requirement must be taken at UCSC and is automatically fulfilled by the completion of major requirements.

### Pre-2010 General Education Requirements

Category	General	Number of
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	Education Code	Required Credits
<b>Introductions to disciplines-humanities and arts area*</b> (from two different disciplines)	IH	10
<b>Introductions to disciplines-natural sciences and engineering area*</b> (from two different disciplines)	IN	10
<b>Introductions to disciplines-social sciences area</b> (from two different disciplines)	IS	10
<b>Topical courses</b> (one course from each of the three academic areas;appropriately designated college courses fulfill this requirement)	T	15
Quantitative course	Q	5
Composition course	C or C1/C2	5-10
Writing-intensive course**	W	5
Arts course	A	5
U.S. Ethnic minorities/non-Western society course	E	5
*For purposes of the general education requirements, humanities and arts are combined in one academic area, as are natural sciences and engineering.		
**The W requirement must be completed at UCSC—transfer courses do not apply to this requirement.		

### GENERAL EDUCATION REQUIREMENTS FOR STUDENTS ENTERING PRIOR TO FALL 2010

Designed to expose students to diverse subject areas, the general education requirements also stress a variety of approaches to acquiring knowledge. A description of the general education requirements and a complete list of current courses that satisfy general education requirements under the pre-2010 general education reform are included.

There are nine categories of general education requirements (see table above, Types of General Education Requirements). Each category has a general education code associated with it, and only those courses carrying that code satisfy the requirement. The codes appear in the course descriptions in this catalog

## Undergraduate Academic Program

and in the [Schedule of Classes](#). A list of [Courses That Fulfill General Education Requirements](#) is included in the catalog. The list is subject to change and is updated quarterly. Students should check the [Schedule of Classes](#) each quarter for the most up-to-date listing of courses that fulfill general education requirements.

Some courses satisfy more than one general education requirement, so the total number of required courses may be 10 to 15.

### **Introductions to disciplines (IH, IN, and IS codes).**

These courses introduce a discipline's content, scope, and methodology. Introductory courses from two different departments are required in each of three academic areas: humanities and arts (IH code), natural sciences and engineering (IN code), and social sciences (IS code). Only one language course may be used to satisfy an IH requirement, as all languages are considered to be part of the same discipline. Similarly, only one literature course may be used, and English (transfer) courses are considered to be literature. Only one of the two IH courses may be from the arts (art, film and digital media, history of art and visual culture, music, and theater arts). Transfer courses designated IN from Anatomy, Botany, Physiology, and Zoology Departments are considered to be "biology" courses for general education purposes.

**Topical courses (T code).** These courses expose students to introductory-level themes of broad social or intellectual relevance. Three courses are required, no more than one from each academic area. For information on which disciplines are in each area, see Arts; Engineering; Humanities; Physical and Biological Sciences; and Social Sciences. College core courses are labeled topical and carry the designation of the appropriate academic area.

**Quantitative course (Q code).** These courses provide methods for acquiring quantitative reasoning that involve use of advanced algebra, statistics, or calculus. One course is required.

**Writing courses (C1, C2, and W codes).** These courses stress explicit attention to the craft of writing. Having satisfied the [Entry Level Writing Requirement](#) by the end of your first year of enrollment at UCSC, you must complete two to three courses in writing. One of these must be a writing-intensive course (W code) that provides instruction and extensive practice in writing applied to a particular subject. For some courses, only certain sections are writing intensive (look for the "W" in the Schedule of Classes when enrolling). You must take this course at UCSC.

Students satisfy the other part of the writing requirement by passing two composition courses (C1

and C2 codes). You must fulfill the composition requirement prior to the seventh quarter of enrollment and before you can enroll in a writing-intensive course.

**Arts course (A code).** These courses provide the exposure to creative or artistic expression necessary for a liberal arts education. One designated arts course is required; most are offered through art, film and digital media, history of art and visual culture, music, and theater arts.

**Ethnic minorities/non-Western society course (E code).** These courses are intended to increase knowledge of ethnic minorities in the United States and non-Western cultures, improve cross-cultural awareness, and explore relationships between ethnicity and other aspects of a liberal arts curriculum. One course is required.

**Courses of fewer than 5 credits.** Students usually meet the general education requirements with 5-credit courses. Several related arts courses of fewer than 5 credits with the same code may be used to satisfy the arts (A) general education requirement if they total at least 5 credits.

## ADVANCED PLACEMENT AND INTERNATIONAL BACCALAUREATE EXAMINATIONS

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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 completing the International Baccalaureate Diploma with a score of 30 or higher receive 30 quarter credits. The credit is applied toward the total credits required for graduation and toward the UCSC campuswide general education requirements, as indicated in the table on pages 29–30, Advanced Placement (AP)/International Baccalaureate Higher Level (IBH) Examinations. 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.

## AP AND IBH EXAMINATION CREDIT TOWARD DEGREE REQUIREMENTS

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Certain departments also allow prospective majors to obtain waivers for prerequisite courses. In all cases, a student should contact the particular department to discuss his or her plans with an adviser. Please note that approval is not automatic; a petition must be filed with most departments.

**CREDIT FOR TRANSFER STUDENTS**

**General Education Requirements**

Transfer students may apply courses taken at other institutions toward the 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 web site](#), 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 or for students transferring from four-year colleges or universities.

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, please contact the Office of Admissions as soon as possible, but only once the official certification has been received by UC Santa Cruz. 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.

<b>IGETC Subject and Unit/Credit Requirements</b>		
<b>Subject Area</b>	<b>Courses Required</b>	<b>Units/Credits Required</b>
<b>1. English Communication</b> 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
<b>2. Mathematical Concepts and Quantitative Reasoning</b>	1 course	3 semester units or 4-5 quarter credits
<b>3. Arts and Humanities</b> Three courses with at least one from the arts and one from the humanities.	3 courses	9 semester units or 12-15 quarter credits
<b>4. Social and Behavioral Sciences</b> Three courses from at least two disciplines or an interdisciplinary sequence.	3 courses	9 semester units or 12-15 quarter credits
<b>5. Physical and Biological Sciences</b> 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
<b>6. Language Other Than English</b> Proficiency equivalent to two years of high school in the same language. (Not required of students transferring to CSU.)	Proficiency	Proficiency
<b>Total</b>	<b>11 courses</b>	<b>34 semester units or 45-57 quarter credits</b>

**Major Requirements and Course Prerequisites**

## Undergraduate Academic Program

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.

### COLLEGE REQUIREMENTS

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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. The core courses are described more fully in the individual [college descriptions](#).

#### College Eight

- College Eight 80A, Introduction to University Discourse: Environment and Society, fall quarter, or College Eight 80B, Rhetoric and Inquiry: Environment and Society, fall quarter or College Eight 80C and 80D, Introduction to University Discourse: Writing for Environment and Society, fall and winter quarters; and College Eight 81A, The Environment and Us, fall quarter.
- College Eight 81A, The Environment and Us, fall quarter.
- College Eight 81B, Fundamentals of Environmental Science, winter quarter.
- College Eight 81C, Designing a Sustainable Future, spring quarter

**Note:** College Eight 81A, and 80A, or 80B, or 80C and 80D are mandatory for all incoming freshmen. College Eight 81B and 81C also satisfy many of UCSC's general education requirements.

#### College Nine

- College Nine 80A, Introduction to University Discourse: International and Global Issues, fall quarter, or College Nine 80B, Rhetoric and Inquiry: International and Global Issues, fall quarter; or College Nine 80C and 80D, Introduction to University Discourse: International and Global Issues Writing Intensive, fall and winter quarters; or 80F, International Global Issues, fall quarter

#### College Ten

- College Ten 80A, Introduction to University Discourse: Social Justice and Community, fall quarter, or College Ten 80B, Rhetoric and Inquiry: Social Justice and Community, fall quarter, or College Ten 80C and 80D, Introduction to University Discourse: Social Justice and Community, Writing Intensive, fall and winter quarters; or 80F, Social Justice and Community, fall quarter

#### Cowell

- Cowell 80A, Introduction to University Discourse: Imagining Justice Past and Present, fall quarter, or Cowell 80B, Rhetoric and Inquiry: Imagining Justice Past and Present, fall quarter

#### Crown

- Crown 80A, Introduction to University Discourse: Ethical Issues in Emerging Technologies, or Crown 80B, Rhetoric and Inquiry: Ethical Issues in Emerging Technologies

#### Kresge

- Kresge 80A, Introduction to University Discourse: Power and Representation, fall quarter, or Kresge 80B, Rhetoric and Inquiry: Power and Representation, fall quarter, or Kresge 80C and 80D, Introduction to University Discourse: Power and Representation Writing Intensive, fall and winter quarters; or 80F, Power and Representation: Collaborative Understandings, fall quarter

#### Merrill

- Merrill 80A, Introduction to University Discourse: Cultural Identities and Global Consciousness, fall quarter, or Merrill 80B, Rhetoric and Inquiry: Cultural Identities and Global Consciousness, fall quarter; or 80F, Communicating Cultural Consciousness, fall quarter

#### Oakes

- Oakes 80A, Introduction to University Discourse: Communicating Diversity for a Just Society, fall quarter, or Oakes 80B, Communicating Diversity for a Just Society, fall quarter, or Oakes 80C and 80D, Introduction to University Discourse: Communicating Diversity for a Just Society Writing Intensive, fall and winter quarters

#### Porter

- Porter 80A, Introduction to University Discourse: Writing Across the Arts, fall quarter, or Porter 80B, Rhetoric and Inquiry: Writing Across the Arts, fall quarter; or 80F, Composition, Creative Inquiry, and the Arts, fall quarter

#### Stevenson

- Stevenson 80A, Introduction to University Discourse: Self and Society, fall quarter, or Stevenson 80B, Rhetoric and Inquiry: Self and Society, fall quarter

Stevenson 81A, Self and Society 2, winter quarter, or Stevenson 81B, Rhetoric and Inquiry: Self and Society 2, winter quarter

## Undergraduate Academic Program

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.

### 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. You are required to declare a major before enrolling in the equivalent of your third year.\* You will not be allowed to enroll in classes for the equivalent of your third year until you have declared a major. Certain majors have a limit on the number of students they can serve. 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. Junior transfer students must declare a major during their second quarter at UCSC by the deadline printed in the [Academic and Administrative Calendar](#) in the [Schedule of Classes](#).

You should determine the requirements for possible major choices as soon as possible because certain majors require substantial preparation, with many interlocking course sequences and qualifying GPAs in certain major foundation courses. If you intend to pursue such a major, you should start work toward it early in your undergraduate career, and review your progress toward qualification regularly. (Review majors that interest you in the [Programs and Courses](#) section.) 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 designed for the major. 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.

### 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."

### 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

## Undergraduate Academic Program

Students may also work with three faculty members to define an individual major specific to his or her academic goals. Proposals for individual majors require considerable effort to develop, and students are advised to consider double major, combined major, and major/minor alternatives. College advising offices can provide information on the individual major proposal and approval process.

### 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) for majors/minors is done by contacting your major adviser (for major 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.

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.

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## EVALUATING ACADEMIC PERFORMANCE

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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 accompanying evaluation of your performance.

### EVALUATIONS

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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 are used at UCSC in academic advising, reviewing scholarship applications, and awarding College Honors and Honors in the major. Evaluations are a permanent part of your academic record. All students may request transcripts either with or without evaluations.

### GRADES

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At the end of each course, you will receive one of the following grade notations:

- A excellent
- B good
- C fair

## Undergraduate Academic Program

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

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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)

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Undergraduates entering UCSC in fall 2001 and thereafter 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 units 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

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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. 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.

### INCOMPLETE

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The notation I may be assigned 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

## Undergraduate Academic Program

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.

The notation IP (In Progress) is reserved for a single course extending over two or three terms of an academic year. The grade for such a course may be awarded at the end of the course and shall then be recorded as applying to each of the terms of the course. A student satisfactorily completing only one or two terms of a course extending over two or three terms of an academic year will be given grades for those terms. The grade option selected in the first quarter of the multiple-term sequence applies to all quarters of the sequence.

Grade changes (except for I and IP, 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

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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

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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

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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 [here](#).

### ACADEMIC STANDING

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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.

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 [here](#).

### MAXIMUM CREDITS AND YEARS

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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.

## Undergraduate Academic Program

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

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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

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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 [Student Policies and Regulations Handbook](#) for more information.

### UNDERGRADUATE HONORS PROGRAM

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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 and colleges 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 solely on the cumulative UC GPA. Faculty review for major and college honors may involve additional criteria.

#### University Honors

To be considered for University Honors at graduation, students must have completed 70 or more units 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 be considered for honors in the major or college honors, students must 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

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#### First-Year Honors Program

The UCSC First-Year Honors Program offers 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,

## Undergraduate Academic Program

colloquia, and other events during each quarter of the academic year. Qualified UCSC applicants who are offered admission to the university will be invited to apply to participate in the program.

### 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.

USCS 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 the following URL:

[registrar.ucsc.edu/records/transcripts/index.html](http://registrar.ucsc.edu/records/transcripts/index.html).

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, 2505 Augustine Drive, Suite 100, 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](http://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.

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## ADVISING: FROM COURSE SELECTION TO CAREERS

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### ACADEMIC ADVISING

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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,

## Undergraduate Academic Program

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 attend Orientation.

### ORIENTATION

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All new UC Santa Cruz students are expected to attend an on-campus orientation. Students who attend Orientation feel better prepared, encounter fewer problems, and receive priority fall class enrollment. Attending Orientation is one of the most important steps a new student takes in preparing for the transition to university life, providing the academic advising needed to make informed decisions about classes and majors, and the opportunity to get questions answered, and learn more about the university.

Orientation begins the process of academic advising and provides a comprehensive introduction to all aspects of UCSC. While at Orientation, students enroll in classes, learn to access campus resources, meet with college and department advisers, meet new and continuing students, learn about the many student organizations on campus, attend a resource fair, take a student ID picture, attend breakout sessions, and gain valuable student life information. Orientation is an indispensable resource that helps facilitate academic and personal success at the university.

**Summer Orientation** is held several times over the course of the summer and includes separate programs for first-year and transfer students, as well as a concurrent program for family members.

**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.

**International Orientation** is required for all international students regardless of residency status. The 10-day 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.

## Undergraduate Academic Program

Students make their reservations for Summer Orientation online through the UC Santa Cruz portal at [MyUCSC](#).

Questions can be directed to the Office of Campus Orientation Programs at (831) 459-5468, or via e-mail to [orientation@ucsc.edu](mailto:orientation@ucsc.edu). Web: [orientation.ucsc.edu](http://orientation.ucsc.edu).

### CAREER CENTER

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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 web site.

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 web site](#).

The Career Center's web site contains a wealth of material on career exploration, graduate and professional schools, job search, career fields, internships, and employers. However, the most exciting online resource is eVisor, scheduled to launch in Fall of 2015. The new online resource 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 web site. 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 web site 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 several times a 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)

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The Educational Opportunity Programs (EOP) provide a variety of academic and personal support programs designed to improve the retention and academic success of first-generation college students from low-income and educationally disadvantaged backgrounds. EOP helps to ensure 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. Below are the programs and services offered through EOP.

#### Advising Programs and Services

EOP Advising programs and services are designed to facilitate personal growth and development for the purpose of achieving academic and social integration, academic achievement, and exposure to opportunities beyond the baccalaureate degree. These programs and services include:

- Advising and personal counseling
- Time-management and study-skills development
- Referrals to resources, programs, and opportunities
- Peer advising
- Community events

#### Bridge Program

The main goal of the Bridge program is to deepen and personalize the UCSC experience. The program offers a select group of EOP students special academic and personal support to facilitate a smooth transition from high school to the university. This support fosters academic achievement and social integration into

## Undergraduate Academic Program

campus life, helping to ensure a successful first-year experience.

### 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 are designed to 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 web site
- Trips to conferences and forums

**Pathways to Research (P2R)** exposes undergraduate students to research opportunities and research based graduate programs. Along with their graduate mentor, participating students will determine their short-term goals for the quarter and long-term goals for the school year related to exploration of and involvement in research. They will engage in bi-weekly meetings to report on progress and plan next steps to reach those goals. Because this is a self-paced program, discipline and student follow-up are key ingredients for success in the program. Anticipate a 10hr/week commitment that includes outside reading and research.

For information about any of these programs, please call the EOP office at (831) 459-2296 or visit [eop.ucsc.edu](http://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 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.

Continuing students who have successfully completed specific introductory courses in biology, chemistry, and mathematics are invited to apply for the MARC and IMSD programs, which begin in the summer and introduce students to program faculty, their research, and 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 run in conjunction with UC LEADS and CAMP, and we also work with other offices to help make the most of campus resources and provide practical assistance with the graduate school admission process. In addition, 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.

The program's well-equipped student office provides additional academic support and a convenient place for students to meet. The staff encourages students to make use of this study space and assists them in learning to use the office's personal computers.

For further information, contact the STEM Diversity office to learn more about eligibility requirements and visit the STEM Diversity Programs web site, or e-mail STEM Diversity Acting Director Yulianna Ortega at [yuli@ucsc.edu](mailto:yuli@ucsc.edu).

### 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 instructor, who has an academic background in the subject, facilitates the problem solving sessions.

## Undergraduate Academic Program

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 instructors 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 non-traditional STEM students. For more information, visit the web site: [ace.ucsc.edu](http://ace.ucsc.edu).

### 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 web site [mep.soe.ucsc.edu](http://mep.soe.ucsc.edu), 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.

For further information regarding all the STARS programs, call (831) 459-2552. For current programs and activities, visit the [STARS web site](#).

### 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

## Undergraduate Academic Program

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 e-mail at [drc@ucsc.edu](mailto:drc@ucsc.edu). Web: [drc.ucsc.edu/](http://drc.ucsc.edu/)

**Campus access for people with mobility impairments.** Visit the [campus Americans with Disabilities Act web site](#) 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

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### 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 with a four-year active duty service commitment.

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. E-mail [afrotc@sjsu.edu](mailto:afrotc@sjsu.edu) or visit the web site:

<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

## Undergraduate Academic Program

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 be 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.

ROTC offers the opportunity to compete for scholarships that can pay for your education. These scholarships consist of tuition, money for books, and a monthly stipend. 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 e-mail at [mcmorales@scu.edu](mailto:mcmorales@scu.edu) or by phone at 408-554-6840, or visit the Army ROTC web site at <http://www.scu.edu/rotc/>.

For more information regarding Army ROTC please visit the Army ROTC web site at <http://www.goarmy.com/rotc.html>.

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## UNDERGRADUATE RESEARCH

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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 an early introduction to the nature of graduate studies. Research projects can help students launch careers, secure admissions to top graduate schools, and truly impact society.

Many majors incorporate research in 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 exist through structured internships or research programs, by joining ongoing faculty research or creative projects, or by developing their own projects under faculty supervision. The next 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

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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 and receive funding to participate in another STEM conference of their choice each year.

The UC LEADS program is headquartered in the STEM Diversity office, along with MARC, IMSD and CAMP. To learn more about eligibility requirements and the UC LEADS program, visit the [STEM Diversity Programs web site](#) or e-mail STEM Acting Director Yulianna Ortega at [yuli@ucsc.edu](mailto:yuli@ucsc.edu).

## CALIFORNIA ALLIANCE FOR MINORITY PARTICIPATION (CAMP)

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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

## Undergraduate Academic Program

prepares undergraduates for graduate education and influences career choices. CAMP programs motivate participants through cooperative learning, internships, faculty mentored research, and travel to professional conferences.

The CAMP program is headquartered in the STEM Diversity office along with MARC, IMSD and UC LEADS. To learn more about eligibility requirements and the CAMP program, visit visit the [STEM Diversity Programs web site](#) or e-mail STEM Acting Director Yulianna Ortega at [yuli@ucsc.edu](mailto:yuli@ucsc.edu).

### NATIONAL SCIENCE FOUNDATION RESEARCH EXPERIENCE

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The National Science Foundation (NSF) funds a large number of summer research opportunities through the Research Experience for Undergraduates (REU) Site Program. Each site, typically at a university, has a group of six to 10 undergraduates who work on specific research projects under the mentorship of faculty and other researchers. Students are granted stipends and, in many cases, assistance with housing and travel. Additional activities, including professional development workshops, tours, and social activities, provide students with opportunities to network and to learn about the culture of science. An REU Site may be at either a U.S. or foreign location.

UCSC hosts the following three REU programs:

- Undergraduate Research in the Biological Effects of Climate Change (Ecology and Evolution)
- Summer Undergraduate Research Fellowship in Information Technology (SURF-IT) (Engineering)
- Lamat Summer Research Program (Computational Astrophysics)

UCSC students are not given preference for these programs, so there is no disadvantage to applying to an REU site at another location. For more information, see [UCSC's REU web site](#).

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## INTERNATIONAL EDUCATION

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The International Education Office (IEO) actively supports UCSC's teaching research, and service missions. IEO encompasses two functional units, UCSC Programs Abroad and International Scholar and Student Services (ISSS).

For further information, contact the International Education Office, 101 Classroom Unit Building, (831) 459-2858, e-mail: [oe@ucsc.edu](mailto:oe@ucsc.edu).

### PROGRAMS ABROAD

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UCSC Programs Abroad offers undergraduate and graduate students the opportunity to study through the University of California, Education Abroad Program (UCEAP) on more than 350 programs in more than 40 countries as part of their regular UCSC academic program. The program serves students at all UC campuses and is administered by the University Office of the Education Abroad Program in Santa Barbara: [eap.ucop.edu](http://eap.ucop.edu).

Additionally, UCSC Programs Abroad assists students participating in study-abroad opportunities through UCSC directly, through other UC campuses, and through privately sponsored organizations. UCSC Programs Abroad seeks to bring these programs within reach of all students.

### INTERNATIONAL SCHOLARS AND STUDENTS

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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.

### FULBRIGHT GRANTS FOR GRADUATE STUDY AND RESEARCH ABROAD

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The International Education Office facilitates the Fulbright annual awards competition for the Graduate Study and Research Abroad Program for currently enrolled UCSC students.

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## FIELD AND EXCHANGE PROGRAMS

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### UCDC PROGRAM AT THE UC WASHINGTON CENTER

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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 a competitive application process to students in all majors who are in good standing and will be juniors or seniors by the quarter in

## Undergraduate Academic Program

which they participate. Students enroll for fall, winter, or spring quarter, earn 12 to 17 course credits, 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 web site](#) or e-mail the UCDC Coordinator at [ucdc@ucsc.edu](mailto:ucdc@ucsc.edu).

### INTERCAMPUS VISITOR PROGRAM

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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 online [here](#). 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

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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 e-mail [registrar@ucsc.edu](mailto:registrar@ucsc.edu), or visit the Web at [Simultaneous Enrollment](#).

### PART-TIME PROGRAM

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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. Applications for undergraduates are available from the Office of the Registrar, 190 Hahn Student Services Building. For more information, call (831) 459-4412, or e-mail [registrar@ucsc.edu](mailto:registrar@ucsc.edu). More information is available on the Web:

[registrar.ucsc.edu/enrollment/part-time-program/index.html](http://registrar.ucsc.edu/enrollment/part-time-program/index.html).

### DOMESTIC EXCHANGE PROGRAMS

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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

## Undergraduate Academic Program

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 [on the Web](#).

### INTERSEGMENTAL CROSS-ENROLLMENT

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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 at [registrar.ucsc.edu/forms/students/crossenrollment.pdf](http://registrar.ucsc.edu/forms/students/crossenrollment.pdf). 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

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Many UCSC students complement their major programs with field experience or off-campus internships, which also provide opportunities for students 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.

## Community Studies Field-Study Program

Community Studies is the oldest interdisciplinary undergraduate program at UCSC. Its hallmarks are a focus on social justice and a distinctive pedagogy that integrates classroom learning with 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 program staff advisers, Community Studies students choose field placements related to the program's areas of focus in economic justice and health justice. Most placements are in California, although students have completed field studies throughout the U.S. and around the world. Field 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 still other organizations with a social justice mission. As political, economic, cultural and technological landscapes shift, so do the needs and venues for social justice organizing. Throughout its history Community Studies has been noteworthy for being attuned and responsive to the dynamics of social justice work and related innovations in field-study opportunities.

## Undergraduate Academic Program

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. More information about Community Studies can be found at [communitystudies.ucsc.edu](http://communitystudies.ucsc.edu).

### **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](#)). 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](#)) does not satisfy an upper-division requirement for the major and is available on a passing/not passing (P/NP) basis only. Interested students should make an appointment or stop by the Economics Field-Study Office: 401

Engineering 2 Bldg.; call (831) 459-5028; or e-mail [econintern@ucsc.edu](mailto:econintern@ucsc.edu). Web: [economics.ucsc.edu](http://economics.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, e-mail: [ckrohn@ucsc.edu](mailto:ckrohn@ucsc.edu). Web: [envs.ucsc.edu/internships](http://envs.ucsc.edu/internships)

### **The Everett Internship Program (formerly the Global Information Internship Program)**

The [Everett Program](#) is a highly innovative, student-managed program that deploys the tools of

## Undergraduate Academic Program

information-communication technology (ICT) and social entrepreneurship to advance social justice, sustainable practices, and progressive institutional change at the global and local levels. Everett is sponsored by the Center for Global, International, and Regional Studies (CGIRS) and the Division of Social Sciences. Since 1998, the Everett Fellows have mentored and funded hundreds of info-savvy social entrepreneurs from UC Santa Cruz to design, implement, and manage collaborative projects with civil society, community, and non-profit groups. The Everett Program empowers students to focus their passion for social change by teaching them how to research, plan, design, fund, and implement ICT-driven projects in partnership with excluded communities. 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. Everett Fellows teach sections and mentor students enrolled in the intensive 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 major and minor, please consult the [Sociology](#) page.

For more information, visit:

[sociology.ucsc.edu/undergraduate/programs-internships/](http://sociology.ucsc.edu/undergraduate/programs-internships/) or call (831) 459-1572.

### **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](mailto: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 Education Abroad Program (EAP).

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 Education Abroad Program (EAP). 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 web site 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](mailto:aalvares@ucsc.edu)). Web: [lals.ucsc.edu](http://lals.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

## Undergraduate Academic Program

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. Information can be viewed on the web at [psychology.ucsc.edu/undergraduate/field-study/index.html](http://psychology.ucsc.edu/undergraduate/field-study/index.html).** 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](#).

### Education Field 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 (grades K–6), and the Single Subject Preliminary credential (grades 7–12), in the following subject areas: English, math, social science, and science. Students may also pursue a Bilingual Authorization in Spanish.

Students pursuing the Education M.A./California Preliminary Credential must complete an extensive student teaching course sequence. Student teaching placements are restricted to enrolled students.

The student-teaching sequence consists of five courses: Education 200, 201, 201A (single subject only), 202A, B, and C. The first and second quarters of the sequence involve part-time placements in public schools in Santa Cruz County, as well as a few schools in North Monterey County. The third quarter of student teaching is a full-time experience in which students gradually take over full responsibility for the daily instructional program of the classroom in which they are placed. Substantial fieldwork 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. As a part of the six-course minor sequence, students engage in field study in schools through Education 180, Introduction to Teaching.

For more information, see [Education](#), or contact the Education Department, 2140B McHenry Library Building, (831) 459-3249. E-mail address: [education@ucsc.edu](mailto:education@ucsc.edu); Web: [education.ucsc.edu](http://education.ucsc.edu).

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## SUMMER SESSION COURSES AND PROGRAMS

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UCSC Summer Session offers UCSC students an opportunity to accelerate progress on their degrees and welcomes visitors from other colleges and universities as well as members of the community (including high school juniors and seniors). A broadly ranging 250 courses are taught by UCSC faculty, lecturers, and graduate students. Often smaller in size than during the academic year, summer session classes include major requirements and qualifying courses, lower- and upper-division courses, general education courses, and online courses. Most courses are five weeks long and offered over two sessions. Students may enroll in multiple classes in either or both sessions, with a maximum of 15 credits per session.

Tutoring and other academic support is available for summer session courses, as are on-campus housing and dining, OPERS fitness center and outdoor recreation, campus employment, and more. Special summer-only programs include Summer Start for International Freshmen, Shakespeare this Summer, and the one-week Dickens Universe. Please visit [summer.ucsc.edu](http://summer.ucsc.edu) for courses and details or e-mail [summers@ucsc.edu](mailto:summers@ucsc.edu) with any questions.

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## UCSC SILICON VALLEY EXTENSION

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Undergraduates and graduate students can find credit fulfillment options and career-oriented courses at UCSC Silicon Valley Extension, the continuing education arm of the university.

UCSC Extension is located in Santa Clara at UCSC Silicon Valley Extension, a facility that is also home to UC Scout and programs of UCSC's Baskin School of Engineering. Classroom courses are held at the Santa Clara location, and UCSC Extension serves adults who live and work in the South Bay, Peninsula, and East Bay communities, as well as on the Central Coast. A large number of popular courses are also available online.

Programs are open enrollment and courses range in length from a single day to multiple weeks. Most class meetings are scheduled on weekday evenings and weekends. Certificate programs focus on advanced professional education and are oriented toward immediate application in the workplace. While most certificates can be completed within one year, coursework is graded and substantial, typically involving lectures, readings, presentations, and final projects or examinations. The key program areas at UCSC Extension are:

- Business and Management

## Undergraduate Academic Program

- Engineering and Technology
- Applied and Natural Sciences
- Education

Extension programs are open to any adult but cater to those who hold undergraduate or graduate degrees and who would benefit from university-level professional study. The instructors are degreed working professionals with practical expertise in the subject areas they teach. In some cases, they are faculty from UC and other educational institutions.

Regularly enrolled UCSC students may obtain degree credit for Extension courses numbered 1–199. Upon submission of the Extension transcript to the Office of Admissions, the course credit may be applied toward a bachelor's degree at UCSC. Extension courses numbered other than 1–199 are not applicable to a UCSC degree. However, many Extension courses are recognized for graduate degree credit by other universities. Check the Extension catalog for details.

UCSC Extension also provides professional education on a contract basis to local corporations and agencies through its academic departments. Upon request, the departments offer management, engineering, bioscience, and education courses and certificates on site at the companies' locations.

Comprehensive program descriptions and course offerings are available online at [ucsc-extension.edu](http://ucsc-extension.edu). To be placed on the mailing list for a print catalog, call (408) 861-3700. The mailing address for UCSC Silicon Valley Extension is 2505 Augustine Drive, Santa Clara, California 95054-3303.

### OPEN CAMPUS/CONCURRENT ENROLLMENT

Concurrent Enrollment through Extension is a cooperative arrangement between UC Santa Cruz and UCSC Extension Silicon Valley 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 Extension Silicon Valley, and course credit granted appears on a UCSC Extension Silicon Valley 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 filed at least one week prior to the first day of instruction for the quarter has a \$65 fee; subsequent applications filed at least one week prior to the first day of instruction for the quarter have a \$20 fee. Applications filed later than one week prior to the first day of instruction for the quarter have a \$110 fee.

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 the application packet, contact UCSC Extension Silicon Valley, 2505 Augustine Drive, Suite 100, Santa Clara, CA 95054-3003, (831) 861-3700. Web: [www.ucsc-extension.edu](http://www.ucsc-extension.edu).

Revised: 09/01/15

**ADVANCED PLACEMENT EXAMS (AP) AND INTERNATIONAL  
BACCALAUREATE HIGHER LEVEL EXAMS (IBH) 2015-2016  
(GENERAL EDUCATION REQUIREMENTS)**

**AP EXAMS**

<b>AP Exams Subject</b>	<b>Score</b>	<b>Quarter Credits</b>	<b>Gen Ed</b>	<b>UCSC Course Equivalency</b>	<b>Notes</b>
AP Art History	3, 4, 5	8	IM		One course waived for the Art major but may not be used in lieu of lower division courses for the History of Art and Visual Culture major.
AP Art, Studio 2-D Design	3,4,5	8	PR-C		Maximum of 8 credits granted for all Studio Art exams.
3-D Design	3,4,5	8	PR-C		
AP Art, Studio Drawing	3	8	PR-C		
Drawing	4,5	8	PR-C	Art 20A	
AP Biology	3,4	8	SI		
	5	8	SI	Biology 20A Biology 20B	
AP Chemistry	3,4	8	SI		
	5	8	SI	Chemistry 1A	
AP Computer Science A	3	2		Computer Science 5J	Contact the School of Engineering.
	4,5	2		Computer Science 12A, 12L	
AP Economics Macroeconomics	3	4	PE-H		Both Economics exams may be taken for credit.
	4,5	4	PE-H	Economics 2	
Microeconomics	3	4	PE-H		
	4,5	4	PE-H	Economics 1	
AP English Language and Composition	3	8			Satisfies Entry Level Writing Requirement (ELWR).
	4,5	8	C1		
Literature and Composition	3	8			Maximum of 8 credits granted for both Language and Composition and Literature and Composition exams
	4,5	8	C1		

AP Exams Subject	Score	Quarter Credits	Gen Ed	UCSC Course Equivalency	Notes
AP Environmental Science	3,4,5	4	PE-E		
AP Government and Politics: Comparative	3,4,5	4	CC		Both Government and Politics exams may be taken for credit.
United States	3,4,5	4			
AP Human Geography	3,4,5	4			
AP History European	3,4,5	8	CC		All History exams may be taken for credit.
United States	3,4,5	8			
World	3,4,5	8	CC		
AP Language and Culture Chinese	3,4,5	8			Each Language and Culture exam may be taken for credit.
Japanese	3,4,5	8			
Italian	3,4,5	8			
French	3,4,5	8			
German	3,4,5	8			
Spanish	3,4,5	8			
AP Latin	3,4,5	4	TA		
AP Spanish Literature and Culture	3,4,5	8	TA		
AP Mathematics Calculus AB (including the AB subscore of Calculus BC exam)	3	4	MF	Applied Mathematics and Statistics 3 Mathematics 3	Allows enrollment in Math 11A or 19A. Maximum of 8 credits granted for both Calculus AB and Calculus BC exams.
	4,5	4	MF	Applied Mathematics and Statistics 3 Mathematics 3 Mathematics 11A Mathematics 19A	Allows enrollment in Math 11B, 19B or 20A. Enrollment in first quarter calculus is recommended for proposed majors in mathematics or the physical and biological sciences. Maximum of 8 credits granted for both Calculus AB and Calculus BC exams.

AP Exams Subject	Score	Quarter Credits	Gen Ed	UCSC Course Equivalency	Notes
AP Mathematics Calculus BC	3	8	MF	Applied Mathematics and Statistics 3 Mathematics 3 Mathematics 11A Mathematics 19A	Allows enrollment in Math 11B, 19B or 20A.  Enrollment in first quarter calculus is recommended for proposed majors in mathematics, physical and biological sciences, and the School of Engineering  Maximum of 8 credits granted for both Calculus AB and Calculus BC exams
	4,5	8	MF	Applied Mathematics and Statistics 3 Mathematics 3 Mathematics 11A, 11B Mathematics 19A, 19B	Allows enrollment in Math 20A, 22 or 23A.  Enrollment in Mathematics 23A is recommended for proposed majors in the School of Engineering.  Maximum of 8 credits granted for both Calculus AB and Calculus BC exams
AP Music Theory	3,4,5	8			
AP Physics Physics 1: Algebra	3,4,5	8	SI		Maximum of 8 credits granted for all Physics exams.
Physics 2: Algebra	3,4,5	8	SI		
C Mechanics	3	4	SI		
	4,5	4	SI	Physics 6A	
	5	4	SI	Physics 5A	
C Electricity and Magnetism	3	4	SI		
	4,5	4	SI	Physics 6C	
	5	4	SI	Physics 5C	
AP Psychology	3	4	PE-H		
	4,5	4	PE-H	Psychology 1	
AP Statistics	3	4	SR		Waives AMS 7/L for Environmental Studies majors
	4,5	4	SR	Applied Mathematics and Statistics 5 Psychology 2	

**NOTE**

If AP and IBH exams and/or college courses are taken in the same subject area, credit may be limited.

No credit is granted for lower-division language and literature other than English if it is the student's native language and at least nine years of education have been completed in that language.

IBH EXAMS

IBH Exams Subjects	Score	Quarter Credits	Gen Ed	Course Equivalency or Waiver	Notes
IBH Biology	5,6,7	8	SI		
IBH Business and Management	5,6,7	8			
IBH Chemistry	5,6,7	8	SI		
IBH Classical Languages: Latin	5,6,7	8			Each Language exam may be taken for credit.
Greek	5,6,7	8			
IBH Computer Science	5	8	MF	Computer Science 12A, 12L	Contact the School of Engineering.
	6, 7	8	MF	Computer Science 12A, 12L Computer Science 12B, 12M	Contact the School of Engineering.
IBH Dance	5,6,7	8	IM		
IBH Economics	5,6,7	8	PE-H		
IBH English A Language and Literature	5,6,7	8	C1		Satisfies Entry Level Writing Requirement (ELWR). Maximum of 8 credits granted for both Engl A: Language and Lit and Engl A: Literature exams
IBH English A Literature	5,6,7	8	C1		Satisfies Entry Level Writing Requirement (ELWR). Maximum of 8 credits granted for both Engl A: Language and Lit and Engl A: Literature exams
IBH English B	5,6,7	8			
IBH Film	5,6,7	8	IM		
IBH Geography	5,6,7	8	PE-E		
IBH History Africa	5,6,7	8	CC		
Americas	5,6,7	8			
East, S.E. Asia, Oceani	5,6,7	8	CC		

<b>IBH Exams Subjects</b>	<b>Score</b>	<b>Quarter Credits</b>	<b>Gen Ed</b>	<b>Course Equivalency or Waiver</b>	<b>Notes</b>
Europe and the Islamic World	5,6,7	8	CC		
Europe and the Middle East	5,6,7	8	CC		
<b>IBH Language A Literature</b>	5,6,7	8			
<b>IBH Language A Language and Literature</b>	5,6,7	8			
<b>IBH Language B</b>	5,6,7	8			
<b>IBH Mathematics</b>	5,6,7	8	MF		
<b>IBH Further Math</b>	5,6,7	8	MF		
<b>IBH Music</b>	5,6,7	8	PR-C		
<b>IBH Philosophy</b>	5,6,7	8	TA		
<b>IBH Physics</b>	5,6,7	8	SI		
<b>IBH Psychology</b>	5,6,7	8	PE-H		
<b>IBH Social/Cult Anthropology</b>	5,6,7	8	PE-H		
<b>IBH Theatre Arts</b>	5,6,7	8	PR-C		
<b>IBH Visual Arts</b>	5,6,7	8	PR-C		

**NOTE**

If AP and IBH exams and/or college courses are taken in the same subject area, credit may be limited.

No credit is granted for lower-division language and literature other than English if it is the student's native language and at least nine years of education have been completed in that language.

## DISCIPLINARY COMMUNICATION GENERAL EDUCATION REQUIREMENTS BY DEPARTMENT

List of Majors	Course Requirements for Disciplinary Communication General Education Requirement
<b>Anthropology B.A</b>	Anthropology 100, 150, 152, 170, or 270 and one of the following: Anthropology 194A, 194B, 194C, 194D, 194E, 194F, 194G, 194H, 194I, 194K, 194L, 194M, 194N, 194O, 194P, 194Q, 194R, 194S, 194T, 194U, 194V, 194W, 194X, 194Y, 194Z, 196A-B, 196C, 196D, 196E, 196F, 196G, 196H, 196I, 196J, 196K, 196L, 196M, 196T, or a senior thesis.
<b>Applied Physics B.S.</b>	Physics 182 and the senior thesis
<b>Art and Design: Games and Playable Media</b>	Art and Design: Games and Playable Media 170
<b>Art B.A.</b>	One of the following: Art 149A, 149B, 190A
<b>Bioengineering B.S.</b>	Computer Engineering 185 or Biomolecular Engineering 185
<b>Biochemistry and Molecular Biology B.S.</b>	One of the following: Biochemistry and Molecular Biology 110L, Biology: Molecular, Cell, and Developmental Biology 100L, 105L, 105M, 109L, 110L, 115L, 121L, 186L, 187L, or Biomolecular Engineering 122 or Microbiology and Environmental Toxicology 119L
<b>Bioinformatics B.S.</b>	Computer Engineering 185 or Biomolecular Engineering 185
<b>Biological Sciences B.A.</b>	Biology: Ecology and Evolutionary Biology 107; and Biology: Ecology and Evolutionary Biology 109
<b>Biological Sciences B.A. with Bioeducation Concentration</b>	Biology: Ecology and Evolutionary Biology 107; and course 109
<b>Biological Sciences B.S.</b>	Biology: Ecology and Evolutionary Biology 107 or 108, or 159A; and Biology: Ecology and Evolutionary Biology 109
<b>Business Management Economics B.A.</b>	Economics 104 or 197
<b>Chemistry B.A.</b>	Chemistry and Biochemistry 151L and one of the following: Chemistry and Biochemistry 146A, 146B, or 146C
<b>Chemistry B.S.</b>	Chemistry and Biochemistry 151L and one of the following: Chemistry and Biochemistry 146A, 146B, or 146C
<b>Chemistry B.S. with Biochemistry Concentration</b>	Chemistry and Biochemistry 151L and Biochemistry and Molecular Biology 110
<b>Chemistry B.S. with Environmental Chemistry Concentration</b>	Chemistry and Biochemistry 151L and one of the following: Chemistry and Biochemistry 146A, 146B, or 146C
<b>Classical Studies B.A.</b>	Two courses from the following: Greek Literature

Undergraduate Academic Program

List of Majors	Course Requirements for Disciplinary Communication General Education Requirement
	102, 103, 104, and 105; or Latin Literature 102, 103, and 104
<b>Cognitive Science B.S.</b>	Psychology 100 and one of the following: Psychology 119E, 119F, 119P, 139A, 139B, 139D, 139F, 139G, 139H, 139J, or 139K
<b>Community Studies B.A.</b>	Community Studies 102 and 194
<b>Computer Engineering B.S.</b>	Computer Engineering 185
<b>Computer Science B.A.</b>	Computer Science 115; 132 and 132W; 180 and 180W; 185; 195; or Computer Engineering 185
<b>Computer Science B.S.</b>	Computer Science 115; 132 and 132W; 180 and 180W; 185; 195; or Computer Engineering 185
<b>Computer Science: Computer Game Design B.S.</b>	Computer Science 170
<b>Critical Race and Ethnic Studies B.A.</b>	Critical Race and Ethnic Studies 190
<b>EarthSciences/ Anthropology Combined Major B.A.</b>	Two of the following: Earth Sciences 100, 101, 102, 104, 109, 120, 140, 146, 148, 150, 152, 160, 188A, 191, 195; Anthropology 100, 170, 194B, 194L, or 194Y
<b>Earth Sciences B.S.</b>	Two of the following: Earth Sciences 100, 101, 102, 104, 109, 120, 140, 146, 148, 150, 152, 160, 188A, 191, 195
<b>Earth Sciences B.S. with Education Concentration</b>	Education 185L and either Earth Sciences 109 or Earth Sciences 120 and 150
<b>Ecology and Evolution B.S.</b>	Biology: Ecology and Evolutionary Biology 107; and Biology: Ecology and Evolutionary Biology 109
<b>Economics B.A.</b>	Economics 104 or 197
<b>Economics/Mathematics Combined Major B.A.</b>	Economics 104 or 197 or Mathematics 100 and 194 or 195
<b>Electrical Engineering B.S.</b>	Computer Engineering 185
<b>Environmental Studies B.A.</b>	Environmental Studies 100 and 100L and one of the following: Environmental Studies 109B, 183B, 190, 195A, 195B, or 196
<b>Environmental Studies/Biology Combined Major B.A.</b>	Environmental Studies 100 and 100L and one of the following: Environmental Studies 109B, 183B, 190, 195A, 195B, 196, or Biology: Ecology and Evolutionary Biology 109
<b>Environmental Studies/Earth Sciences Combined Major B.A.</b>	Environmental Studies 100 and 100L and either Environmental Studies 109B, 183B, or 190, or 195A, or 195B, or 196, or Earth Sciences 195, or Earth Sciences 188A-B
<b>Environmental Studies/Economics</b>	Environmental Studies 100 and 100L and one of the following: Environmental Studies 109B, 183B, 190, 195A,

Undergraduate Academic Program

List of Majors	Course Requirements for Disciplinary Communication General Education Requirement
<b>Combined Major B.A.</b>	195B, or 196
<b>Feminist Studies B.A.</b>	One of the following: Feminist Studies 194A, 194D, 194E, 194F, 194G, 194H, 194I, 194K, 194M, 194N, 194O, 194P, 194Q, 194T, or 195
<b>Film and Digital Media B.A.</b>	One of each of the following: Film and Digital Media 130, 132A, 132B, 134A, or 134B; and Film and Digital Media 194A, 194B, 194C, 194D, 194E, 194F, 194G, 194S, 195, 196A, 196B, 196C, or 197
<b>German Studies B.A.</b>	History 196G or 196P or 196X or LTMO 190Z
<b>Global Economics B.A.</b>	Economics 104 or 197
<b>History B.A.</b>	One of the following: History 190A, 190B, 190C, 190D, 190E, 190F, 190G, 190H, 190I, 190J, 190K, 190L, 190M, 190N, 190O, 190P, 190Q, 190R, 190S, 190T, 190U, 190W, 190X, 190Y, 190Z, 194A, 194B, 194E, 194F, 194G, 194H, 194J, 194M, 194N, 194O, 194P, 194Q, 194R, 194U, 194W, 194Y, 195A-B, 196A, 196C, 196D, 196E, 196F, 196G, 196H, 196I, 196J, 196K, 196M, 196N, 196O, 196P, 196Q, 196R, 196S, 196T, 196U, 196V, 196W, 196X, 196Y, or 196Z
<b>History of Art and Visual Culture B.A.</b>	History of Art and Visual Culture 100A
<b>Human Biology B.S.</b>	Biology: Molecular, Cell, and Developmental 130L and BIOL 189 and 189W
<b>Information Systems Management B.S.</b>	Information Systems Management 158
<b>Italian Studies B.A.</b>	History 196C, 196D, or 196Y; or Italian Literature 191 and one of the following: History 164A, 164B, 183A, 183B; History of Art and Visual Culture 135F, 137B, 137C, 137D, 137E, 153, 154, 190V; Italian Literature 102, 130B, 130C, 130D, 150B, 150C, 160, 164, 165, 170A, 180; Modern Literary Studies 144H, 144I, 149A, 170, Pre- and Early Modern Literature 131, 150, 162, 163, 183, or 190C
<b>Jewish Studies B.A.</b>	One of the following: History 196G, 196M, 196N, 196P, or 196R, or JWST 195A-B, or LTPR 190Y, or LTMO 190Y, or JWST 190A and HISC 190A
<b>Language Studies B.A.</b>	Linguistics 101 and either 111 or 112
<b>Latin American and Latino Studies/Global Economics Combined Major B.A.</b>	Latin American and Latino Studies 100A or 100W, and 100B
<b>Latin American and Latino Studies/Global Economics Combined Major B.A.</b>	Latin American and Latino Studies 100A or 100W, and 100B
<b>Latin American and Latino Studies/Literature Combined Major B.A.</b>	Latin American and Latino Studies 100A or 100W, and 100B
<b>Latin American and Latino Studies/Politics Combined Major B.A.</b>	Latin American and Latino Studies 100A or 100W, and 100B

Undergraduate Academic Program

List of Majors	Course Requirements for Disciplinary Communication General Education Requirement
<b>Latin American and Latino Studies/Sociology Combined Major B.A.</b>	Latin American and Latino Studies 100A or 100W, and 100B
<b>Legal Studies B.A.</b>	Legal Studies 111A and 160B; or 196; or Senior Thesis 195A, 195B, 195C
<b>Linguistics B.A.</b>	Linguistics 101 and 112
<b>Literature B.A.</b>	Literature 101
<b>Marine Biology B.S.</b>	Biology: Ecology and Evolutionary Biology 107 or 108, or 159A; and Biology: Ecology and Evolutionary Biology 109
<b>Mathematics B.A.</b>	Mathematics 100 and either 194 or 195
<b>Molecular, Cell, and Developmental Biology B.S.</b>	One of the following: Biochemistry and Molecular Biology 110L, Biology: Molecular, Cell, and Developmental Biology 100L, 105L, 105M, 109L, 110L, 115L, 120L, 121L, 186L, 187L; Biomolecular Engineering 122; Microbiology and Environmental Toxicology 119L
<b>Music B.A./B.M.</b>	Music 101A and 101C
<b>Neuroscience B.S.</b>	One of the following: Biology: Ecology and Evolutionary Biology 141L; Biology: Molecular, Cell, and Developmental Biology 100L, 105L, 109L, 110L, 115L, 120L, 121L, or 186L, 187L; Biomolecular Engineering 122
<b>Philosophy B.A.</b>	Two of the following: Philosophy 100A, 100B, 100C
<b>Physics Education B.S.</b>	Physics 182 and the senior thesis
<b>Physics B.S.</b>	Physics 182 and the senior thesis
<b>Physics: Astrophysics B.S.</b>	Physics 182 and the senior thesis
<b>Plant Sciences B.S.</b>	Biology: Ecology and Evolutionary Biology 107 and BIOE 109
<b>Politics B.A.</b>	Three of the following: Politics 105A, 105B, 105C, 105D, 120A, 120B, 120C, 140A, 140C, 140D, 160A, 160B, 160C, 160D
<b>Psychology B.A.</b>	Psychology 100 and one of the following: Psychology 119A, 119B, 119D, 119E, 119F, 119H, 119I, 119K, 119M, 119P, 119S, 119T, 139A, 139B, 139D, 139F, 139G, 139H, 139J, 139K, 159A, 159D, 159E, 159F, 159H, 159X, 179A, 179B, 179D, or 179G
<b>Sociology B.A.</b>	Sociology 103B
<b>Spanish Studies B.A.</b>	Spanish 114 or Spanish and Spanish for Heritage Speakers 115
<b>Theater Arts B.A.</b>	Theater Arts 160 and 185

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## GRADUATE STUDIES

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### 2015-16 General Catalog

UC Santa Cruz offers graduate study in more than 30 academic fields. About 1,500 graduate students are enrolled at the certificate, master's, and doctoral levels. The small size of the UCSC graduate programs encourages close working relations between students and faculty in an informal atmosphere conducive to rapid learning and professional growth. Many graduate programs have interdisciplinary components, and students are encouraged to explore the conceptual

connections between related fields as they acquire mastery in their areas of specialization.

Research facilities at UCSC are excellent, and there are extensive opportunities for graduate students to engage in significant independent study and research (see [Resources for Learning and Research](#)). 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.

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## DEGREES AND PROGRAMS

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The University of California, Santa Cruz, offers graduate programs leading to advanced degrees or certificates in the following areas:

<b>Department</b>	<b>Degree or Certificate</b>
Anthropology	Ph.D.
Applied Economics and Finance	M.S.
Astronomy and Astrophysics	Ph.D.
Biomolecular Engineering and Bioinformatics	M.S./Ph.D.
Chemistry and Biochemistry	M.S./Ph.D.
Computer Engineering	M.S./Ph.D.
Computer Science	M.S./Ph.D.
Digital Arts and New Media	M.F.A.
Earth Sciences	M.S./Ph.D.
Ecology and Evolutionary Biology	M.A./Ph.D.
Economics	Ph.D.
Education	Ph.D.
Education: Teaching (credential program)	M.A.
Electrical Engineering	M.S./Ph.D.
Environmental Studies	Ph.D.
Feminist Studies	Ph.D.
Film and Digital Media	Ph.D.
Games and Playable Media	M.S.
History	M.A./Ph.D.
History of Consciousness	Ph.D.
Latin American and Latino Studies	Ph.D.
Linguistics	M.A./Ph.D.
Literature	M.A./Ph.D.
Mathematics	Ph.D.

## Graduate Studies

Department	Degree or Certificate
Microbiology and Environmental Toxicology	M.S./Ph.D.
Molecular, Cell, and Developmental Biology	M.A.
Music	M.A./D.M.A./Ph.D.
Ocean Sciences	M.S./Ph.D.
Philosophy	M.A./Ph.D.
Physics	M.S./Ph.D.
Politics	Ph.D.
Program in Biomedical Sciences and Engineering	Ph.D.
*Bioinformatics and Computational Biology	
*Mechanistic, Structural, and Chemical Biology	
*Molecular, Cell, and Developmental Biology	
*Microbial Biology and Pathogenesis	
Psychology (social, developmental, or cognitive)	Ph.D.
Science Communication: Science Writing	Certificate
Social Documentation	M.A.
Sociology	Ph.D.
Statistics and Applied Mathematics	M.S./Ph.D.
Technology and Information Management	M.S./Ph.D.
Theater Arts	M.A.
Visual Studies	Ph.D.

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### PROGRAM DESCRIPTIONS

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Descriptions of individual programs appear under the specific disciplines in the [Programs and Courses](#) section. Application materials for all programs are available online at the [Division of Graduate Studies](#); applications for the upcoming academic year are available starting October 1 of the prior year.

All UCSC graduate programs have information on the web at [www.ucsc.edu/academics](http://www.ucsc.edu/academics). Inquiries about part-time study should be directed to the individual departments. If there are any problems with the online application process, please e-mail [gradadm@ucsc.edu](mailto:gradadm@ucsc.edu).

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### ADMINISTRATION

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At UCSC, 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](#).

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### CATALOG RIGHTS

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Students matriculating in a given graduate program will select the UCSC General Catalog they will follow to meet their requirements. This can be either the one 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, and will communicate this information in the letter offering readmission. This determination constitutes a formal requirement for readmission to the program, and the student's acceptance of readmission implies acceptance of the program's written stipulation of remaining degree requirements. Should any student choose to follow

catalog requirements for a year in which the catalog is not printed in hard copy, the requirements will include any online catalog update for that year. 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](#).

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### EVALUATION OF PERFORMANCE

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Graduate students are graded Satisfactory/Unsatisfactory (S/U) or, at student option, A, B, C, D, F. The grade A, B, or S is awarded for satisfactory work. A graduate student receiving a grade of C, D, or U will not be able to use the credit for that course to satisfy any course requirement for a graduate degree. Courses in which a graduate student receives a grade of C, D, F, or U may be repeated. Credits 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 in all courses taken for credit at UC Santa Cruz may also be evaluated according to the Narrative Evaluation System. A narrative evaluation typically describes the nature and requirements of the course, the student's strengths and weaknesses in the various aspects of the course (e.g., discussion, laboratory work, term papers, and examinations), and the student's general understanding of the course content. Evaluations may be used by academic advisers and become part of the student's official academic record.

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](#).

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### DIVERSITY-ENHANCEMENT PROGRAMS

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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 web site](#).

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### EXCHANGE PROGRAM

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A graduate student in good standing at UC Santa Cruz who wishes to take advantage of educational opportunities available only at another campus of the University of California may become an intercampus exchange graduate student for a quarter or more. This program also permits students to take courses at more than one UC campus during the same quarter.

To participate in the program, a student must have the approval of his or her faculty adviser, the dean of the Division of Graduate Studies at UC Santa Cruz, and the graduate dean on the campus to be visited. Application forms may be obtained from the Division of Graduate Studies and should be submitted three weeks before the quarter in which the exchange begins.

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## STUDENT LIFE

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The campus offers a variety of programs to enhance the quality of student life, all of which are available to graduate students. These include childcare, sports and recreation, health services, cultural events, transportation services, and the UCSC Women's Center. See [Campus Life](#) for information on these services and a description of the local community. See [Disability Resource Center](#) for services available to students with disabilities.

### COLLEGE AFFILIATION

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Graduate students at Santa Cruz have the opportunity to affiliate with one of the 10 colleges on campus ([college descriptions](#)). Participation in the activities of a college may include taking an occasional meal there, living at the college, or participating in the college's educational and preceptorial programs or in its extracurricular activities.

### GRADUATE STUDENT ASSOCIATION

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The Graduate Student Association (GSA) is an organization of all graduate students at UCSC. It seeks to advance the general welfare of the graduate student body and is responsible for promoting extracurricular activities on campus.

Graduate students elect a GSA steering committee, which coordinates activities and their funding. In past years, the steering committee has sponsored student social gatherings, musical events, poetry readings, lectures by visiting scholars, and other activities of special interest to graduate students. A portion of the college student government fee, paid by all students, is available to the association for this purpose. The steering committee also recommends graduate students for appointment to university committees.

### GRADUATE STUDENT COMMONS (GRAD COMMONS)

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Located in the Quarry Plaza, the Graduate Student Commons (Grad Commons) exists solely to serve the needs and interests of graduate students at UCSC. The Grad Commons is the only building on campus that is owned and operated entirely by graduate students. It provides a comfortable and welcoming space, fostering graduate student interaction and a sense of community. The Grad Commons is open 24 hours a day for all graduate students and graduate student groups to use the various study and meeting rooms. In addition, the Grad Commons holds numerous events each quarter to enrich graduate student life and cultivate professional development.

Social events such as monthly 1st Friday Socials, quarterly parties, and art shows are sponsored by the Grad Commons to promote a sense of community and cohesion among graduate students across the various departments. Health and wellness activities are available to help graduate students relax from the stresses of TAing and research. The Grad Commons also offers a wide range of professional development workshops each quarter to support graduate student success in academia and beyond. Past professional development workshop topics include: grant writing, conflict management, résumé and CV writing, web site design, time management, teaching and diversity statements, communication skills, preparing for your Qualifying Exam, and more. Visit the [Graduate Student Commons web site](#) to learn about upcoming programming and ways to get involved with the Grad Commons.

### HOUSING

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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 will want to start looking at available rentals and costs as soon as possible.

On-campus Graduate Student Housing for 82 individual students is located adjacent to "Science Hill," home to many of UCSC's academic facilities. Four students share a furnished apartment with four single bedrooms, living room, kitchen, dining room, and bathroom. Visit the [Grad Housing web site](#), or email [gradhsg@ucsc.edu](mailto:gradhsg@ucsc.edu).

Students with families may apply to live in Family Student Housing, a complex of two-bedroom unfurnished apartments. Located on the west side of campus, the 22-acre site is adjacent to a nature reserve and overlooks the Monterey Bay. Refer to the [Family Student Housing web site](#), or email [fsh@ucsc.edu](mailto:fsh@ucsc.edu).

To assist students in locating living accommodations in the surrounding communities, the Community Rentals Office maintains [a list of available rentals](#).

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## APPLICATION AND ADMISSION

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### APPLICATION DEADLINES

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Students may apply for only one UCSC graduate program at a time. A list on the [Graduate Studies web site](#) shows the date set by each program as the final deadline for submission of all documents. Please visit the Graduate Studies web site for the most current information on applying to UCSC graduate programs. Application deadlines may be updated on or before applications open. The dates listed are the official

## Graduate Studies

deadlines, but students are strongly advised to submit applications well in advance of the deadline. If an application deadline falls on a weekend or holiday, there will not be staff available for assistance.

To be considered for fellowship support for fall quarter, the application for admission and all supporting materials must arrive at the Division of Graduate Studies by the program's deadline or by Feb. 1, 2015, whichever is earlier.

### ADMISSION REQUIREMENTS

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To be admitted with graduate status at UCSC, a student must have completed a bachelor's degree or its equivalent from an accredited undergraduate institution of acceptable standing and demonstrate ability to pursue a program of study leading toward an advanced degree. Preparation must provide an adequate foundation for advanced study, as determined by the department for the program in which the student intends to enroll. If the bachelor's degree is not in the same discipline as the graduate program, the student must have sufficient preparation in the intended area of study to undertake graduate-level work.

To apply for admission, application materials (including test scores, written materials, and any required supplemental materials) must be submitted before the deadline date to the Division of Graduate Studies. UC Santa Cruz requires that applicants complete an online application to be considered for admission to a graduate program. The application and the accompanying materials should be complete and accurate.

**Admission application.** Applications for all programs are available online at the [Graduate Studies web site](#). The completed application is paid for online with either a credit card or e-check. This application fee is not refundable. [Application fee waivers](#) are available for cases of hardship and fee exemptions are available for students who participated in approved grad-prep programs. International applicants are not eligible for fee waivers.

**Graduate Record Examination (GRE) scores.** If the applicant is applying for admission to a program that requires the GRE, the scores must be received by UC Santa Cruz Graduate Application Processing before the application deadline. It is strongly recommended that all applicants complete testing by November, since December test scores will not reach the division prior to most application deadlines.

The Educational Testing Service should be asked to forward the test scores directly to the division. UC Santa Cruz's school code is 4860. Test results are electronically submitted to UC Santa Cruz Division of

Graduate Studies four to six weeks after the exam has been taken. Please consult the [Graduate Studies web site](#) to see which exams are required for each program.

**Supplemental material.** Many graduate programs have special application requirements, such as writing samples, portfolios, auditions, or personal interviews. The [Graduate Studies or program web site](#) (or the web site for the program to which the student is applying) should be consulted and all of the requirements specified should be fulfilled.

### DUPLICATION OF HIGHER DEGREES

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It is the policy of the 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

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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.

## INTERNATIONAL APPLICANTS

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Applicants from other countries must meet standard admission requirements and, upon admission, provide satisfactory evidence of financial support before they may obtain the necessary visa documents. Because it normally takes much longer to process international applications, such students are urged to apply as early as possible. Once the student has been formally admitted, a Certificate of Eligibility (I-20) will only be issued by the UC Santa Cruz Office of International Education when all requirements are satisfied. Please note that international students are eligible for neither need-based financial aid nor application fee waivers.

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. Chemistry and Biochemistry, Computer Engineering, Computer Science, and Electrical Engineering require 570 on the paper-based test, 230 on the computer-based test, and 89 on the Internet-based test. 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.

For those choosing to take the IELTS, our institution requires an overall band score of 7 or higher on the IELTS. An overall 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. UC Santa Cruz only accepts scores submitted electronically by the IELTS test center. No paper Test Report Forms will be accepted. An institutional code is NOT required. Please contact the test center where you took the test directly and request that your test scores be sent electronically using the IELTS system. All IELTS test centers worldwide are able to send scores electronically to our institution. For inquiries on test dates, fees, and preparation, please contact your nearest test center (see the [IELTS web site](#)).

All official academic records must be issued in the original language and accompanied by English translations prepared by the issuing institution. If

translations are not available from the institution itself, translations may be prepared by government or official translators. In order for translations to be acceptable, they must bear the stamp or seal of the issuing institution or government agency and the original signature of the translator. They must be complete and exact word-for-word translations of the original documents, not interpretations. Grades must not be converted to the American scale. Specially prepared English versions are not acceptable in place of documents issued in the original language. Once submitted, documents may not be borrowed, returned to you or sent elsewhere.

International applicants are not required to submit evidence of financial support until they have received formal admission to a graduate program. A Certificate of Eligibility (I-20) will not be issued by the UC Santa Cruz International Programs office until all standard admissions requirements have been met and the UCSC Financial Certificate and supporting financial documents have been received and approved.

## APPLICATION PROCESSING

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The Division of Graduate Studies receives most application materials and creates a file for each applicant. Once the application is submitted online, it will be available to the appropriate department for review and recommendation. Applicants are admitted by the graduate dean following recommendations by the departments. Applicants will be notified by e-mail whether or not they have been admitted for graduate study at UCSC after all reviews are complete. Under no circumstances will UCSC give out this information over the phone, in person, or by proxy. By a general agreement to which UC Santa Cruz and most graduate schools in the U.S. are signatories, applicants admitted to graduate schools have until April 15 to reply with their acceptance of fellowship offers. Any information about the completeness of the file can be found on the [MyUCSC](#) student portal once an application has been submitted. Specific questions about the evaluation of the application should be directed to the department to which you are applying.

NOTE: Expense figures below to be verified in July.

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**FEES AND EXPENSES**


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Fees and expenses for graduate students are shown below. 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](#).

<b>Graduate Student Fees, 2015-16</b>		
	<b>One Quarter</b>	<b>F-W-S Quarters</b>
Student Services Fee (formerly University Registration Fee)	\$340.00	\$1020.00
Tuition (formerly Educational Fee)	\$3,740.00	\$11,220.00
Campus-Based Fees	\$355.86	\$1,067.58
GSHIP Health Insurance (waivable)	\$1,314.00	\$3,942.00
<b>Total for California Residents</b>	\$5,749.86	\$17,249.58
Nonresident Supplemental Tuition (a)	\$5,034.00	\$15,102.00
<b>Total for Nonresidents of California</b>	10,783.86	32,351.58

(a) A limited number of Nonresident Tuition Fellowships are available. Please refer to the [Financial Support](#) section.

For information on fee refunds, see [Finances](#).

Minimum annual expenses, including registration fees, for a single graduate student living on campus are estimated to be \$40,013.58 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 2015-16 academic year is provided below. Non-California residents should add \$15,102 in nonresident tuition and fees to the total.

<b>Graduate Student Budget, 2015-16</b>	
Fees	\$17,249.58
Books and supplies	\$1,524.00
Room and board (on or off campus) (a)	\$16,695.00
Transportation (b)	\$1,668.00
Personal	\$2,877.00
<b>Total</b>	<b>\$40,013.58</b>

a) Estimated room and board for graduate students living with family is \$4,368.

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](#).

## REQUIRED FEES

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Required fees are due and payable before the start of each quarter. These typically include tuition and fees, on-campus housing and meals if applicable, and campus health insurance if you do not secure a waiver. You will need sufficient funds to cover required fees and other personal expenses at the start of each term. 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.

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 of plant; 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 childcare, 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 web site](#), 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 are listed in the [Schedule of Classes](#) and the [Graduate Student Handbook](#).

## NONRESIDENT TUITION

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A resident of a state other than California or of another country must also pay nonresident tuition. General criteria for residency are in [Appendix A](#).

**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

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Late fees may be assessed if a student fails to make university payments or enroll by the specified deadlines. Late fees are assessed on a graduated basis for each month there is an unpaid balance on your university account. Late fee amounts of \$50 for each late registration payment and/or late enrollment and \$25 for a late housing payment. 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

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See the information under [undergraduate expenses](#).

## FINANCIAL SUPPORT

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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 January 1 prior to the academic year for which you are requesting aid. The FAFSA may be filled out online and filed electronically at [www.fafsa.gov](http://www.fafsa.gov). To receive need-based support for the fall quarter, the FAFSA should be submitted no later than three weeks prior to the end of spring quarter of the year you are enrolled. 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 [financialaid.ucsc.edu](http://financialaid.ucsc.edu). Students may also visit the Financial Aid and Scholarships Office, 205 Hahn Student Services Building, or call (831) 459-2963.

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## FELLOWSHIPS, ASSISTANTSHIPS, GRANTS

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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. The Cal Grant A and Cal Grant B programs paid a maximum of \$12,192 for 2014–15 for study at the University of California. 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 web site](#).

**Teaching Assistantships.** For the 2015-16 academic year, half-time teaching assistantships provide a salary of \$6,427 per quarter.

**Graduate Student Researcher Internships.** For the 2015-16 academic year, salaries for graduate student research positions range from \$4,386 to \$7,370 per quarter (depending on department) with state and federal taxes withheld from these amounts. The division and the [UCSC Career Center](#) can provide information about external graduate fellowships and grants.

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## STUDENT LOANS

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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 web site](#).

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## LOAN FORGIVENESS PROGRAMS

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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 web site](#).

Revised: 09/01/15

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## RESOURCES FOR LEARNING AND RESEARCH

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2015-16 General Catalog

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### UNIVERSITY LIBRARY

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The Science & Engineering and recently renovated McHenry libraries house the impressive holdings of UCSC's [University Library](#)—the largest library collection between Santa Barbara and San José. In nearly five decades, the collection has grown from a few shelves of books and a substantial dependence on the libraries of UC Berkeley to more than 2.3 million volumes, over 56,000 periodical titles (including online journals), nearly 39,000 microforms, and more than 411,000 non-print items including films, slides, and audio and video recordings.

As part of the statewide University of California library system, the University Library also serves as a gateway to millions of other books and periodicals. The library's efficient Interlibrary Loan service is heavily used, facilitated by the online request service of the systemwide Melvyl® Catalog.

The University Library collection is divided into two parts. Resources in the humanities, arts, and social sciences are contained in McHenry Library at the heart of the campus, while the engineering, mathematics, and physical and biological sciences collections are housed in the award-winning Science & Engineering Library, conveniently located on "Science Hill."

Collections librarians manage the growth and development of UCSC's collection and provide in-depth research assistance and instruction.

Most of the holdings of the University Library are shelved in open stacks. Students and faculty are encouraged to help themselves, using information found via the local Cruzcat online library catalog, the Melvyl Catalog, and the library web site. The library home page provides a convenient gateway to the Cruzcat and Melvyl catalogs, the California Digital Library, and a host of other electronic information resources, such as article databases and online journals. The library staff is also eager to offer its assistance at any of its service desks.

At the McHenry Library reference desk, as well as by e-mail and appointment, librarians and reference specialists give individual guidance: general orientation for the newcomer and specialized help for the researcher. They assist in the use of a wide range of resources—in print and online—including more than

200 online article databases to which the library subscribes.

The Reserves service, located at the respective circulation desks, lends copies of assigned class readings on a short-term basis and provides protection for vulnerable circulating materials and heavily used periodicals.

[Special Collections](#) at McHenry Library contains rare, valuable, and often fragile materials that do not circulate. Holdings focus on local and campus history, and 20th-century literature and book arts. Special Collections also houses the official campus archive, as well as the archives of George Barati, Gregory Bateson, Thomas Carlyle, the Grateful Dead, Lou Harrison, Robert Heinlein, Kenneth Patchen, Brett Weston, and the Shameless Hussy, Trianon, and Turtle Island presses.

Other important collections and services include:

- [The Digital Collections web site](#), containing 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.
- Government Publications, a selective depository for documents published by U.S., California, and Santa Cruz government agencies
- The Media Center, which provides access to audio and video in all formats; CD-ROMs; support for music study, including music scores and music course reserves via iTunes; and language-related audio and video recordings
- The Mary Lea Shane Archives of the Lick Observatory, a national resource for the history of astronomy
- The Regional History Project's documentation of Central California history

For more information, see the [University Library web site](#).

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### COMPUTING FACILITIES AND TECHNOLOGY SERVICES

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#### INFORMATION TECHNOLOGY SERVICES (ITS)

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[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, e-mail, 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 E-mail**

All students, faculty, and staff have a UCSC account called CruzID and a UCSC e-mail account, for example [cruzid@ucsc.edu](mailto:cruzid@ucsc.edu). All official UC and UCSC communication is e-mailed to the [@ucsc.edu](mailto:@ucsc.edu) address. In addition to e-mail, CruzID gives individuals access to many campus systems and applications. More information is available at [UCSC E-mail 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](mailto: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**

[eCommons](#) is the campus online course-management system used to create sophisticated web-based course materials to supplement, but not replace, classroom instruction. eCommons uses a web browser as the interface for the course.

Faculty using eCommons 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 eCommons 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 e-mail, 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.

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## **NATURAL RESERVE SYSTEM (NRS)**

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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 ecology and environmental sciences in general.

The University of California administers 38 natural reserves throughout the state. 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

the campus's own Natural Reserve. Information about these reserves is available at the [UC Santa Cruz Natural Reserves web site](#). Information about the UC system's holdings and management is available at the [University of California Natural Reserve System web site](#). You may also contact the UCSC Natural Reserve director, c/o Environmental Studies Department, 467 Natural Sciences 2 Building, at (831) 459-4971, or by e-mail at [ghdayton@ucsc.edu](mailto:ghdayton@ucsc.edu).

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## RESEARCH PROGRAMS AND FACILITIES

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Research at UC Santa Cruz is thriving, facilities are excellent, and the amount of external funding received for research continues to grow. In addition to their individual research projects, faculty are involved in organized research on various scales, from small focused activities within academic divisions, to large research units, some with campuswide scope and others with wider connections to the whole 10-campus University of California system.

Research programs and facilities are described below by academic division: [Arts Division](#); [Baskin School of Engineering](#); [Humanities Division](#); [Physical and Biological Sciences Division](#); and [Social Sciences Division](#). [Interdisciplinary and Systemwide](#) research programs are also listed.

Specialized research facilities in addition to those listed below are described in the [Programs and Courses](#) section.

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## ARTS DIVISION RESEARCH CENTERS AND INSTITUTES

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[The Arts Research Institute \(ARI\)](#)  
[The Center for Documentary Arts and Research \(CDAR\)](#)  
[Center for Force Majeure Studies](#)  
[The Innovation and Design Lab \(IDL\)](#)  
[The OpenLab Network](#)  
[The Social Practice Arts Research Center \(SPARC\)](#)

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## TEACHING, RESEARCH, AND PERFORMANCE FACILITIES

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Arts Information Technology Services (ITS) Labs ([Porter Arts Mac Lab](#) and the [Music Lab](#))  
[Baskin Visual Arts Center](#)  
[Digital Arts Research Center \(DARC\)](#)  
[UCSC's Music Center](#)  
[The Theater Arts Center](#)

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## BASKIN SCHOOL OF ENGINEERING

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### BASKIN SCHOOL OF ENGINEERING (BSOE) RESEARCH CENTERS AND INSTITUTES

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[Center for Games and Playable Media/](#)  
[Center for Maximizing Abilities Through Technology, Education and Research \(MATTER\)](#)  
[Center for Research in Intelligent Storage \(CRSS\)](#)  
[Center for Sustainable Energy and Power Systems \(CenSEPS\)](#)  
[Information Technologies Institute \(ITI\)](#)  
[Institute for Scalable Scientific Data Management \(ISSDM\)](#)  
[Storage Systems Research Center \(SSRC\)](#)  
[W. M. Keck Center for Adaptive Optical Microscopy](#)  
[W. M. Keck Center for Nanoscale Optofluidics](#)  
[UC Santa Cruz Genomics Institute](#)  
[UCSC Genome Technology Center](#)

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## BASKIN SCHOOL OF ENGINEERING (BSOE) FACILITIES

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### BSOE COMPUTING INFRASTRUCTURE

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#### Research Laboratories

[Advanced Visualization and Interactive Systems Lab](#)  
[Applied and Nano-Optics](#)  
[Autonomous Systems Lab](#)  
[Biomolecular Engineering Research Facilities](#)  
[Computer Communication Research Group \(CCRG\)](#)  
[Database Group](#)  
[Design and Verification Laboratory](#)  
[Geospatial Visualization Laboratory](#)  
[Group Researching Advances in Software Engineering \(GRASE\)](#)  
[Hybrid Systems Laboratory](#)  
[Image Processing and Multimedia Laboratory \(IPMML\)](#)  
[Information Retrieval and Knowledge Management Lab \(IRKM\)](#)  
[Internetworking Research Group \(i-NRG\)](#)  
[Materials Synthesis and Characterization Research Lab](#)  
[Micro-Architecture at Santa Cruz \(MASC\)](#)  
[Multidimensional Signal Processing Research Group \(MDSP\)](#)  
[Network Management and Operations Lab](#)  
[Systems Research Lab](#)

## Resources for Learning and Research

[UCSC Broadband Communications Research Group](#)  
[UCSC Computer Vision Lab](#)  
[UCSC Scientific Visualization Laboratory](#)  
[VLSI Design Automation](#)  
[W. M. Keck Seismological Laboratory](#)

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### HUMANITIES DIVISION

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#### RESEARCH PROGRAMS

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**[The Institute for Humanities Research \(IHR\)](#)** at UC Santa Cruz is a laboratory for theorizing and implementing new visions of the humanities.

UC Santa Cruz's Humanities Division plays crucial role in the university's mission to inspire and educate students for both personal and professional success. Our students question what it means to be human and investigate the impact that language, culture, and gender have on the human experience.

The IHR cultivates faculty and student research, supports multi-campus research projects, and fosters community engagement through internships and public programming. In addition to the research centers listed below, the IHR houses a multitude of research clusters whose projects tackle topics relevant to an international, multicultural audience.

Institute for Humanities Research centers and projects include:

[Center for Cultural Studies](#)

[Center for Jewish Studies](#)

[Center for Labor Studies](#)

[Center for Mediterranean Studies](#)

[Center for the Study of Pacific War Memories](#)

[Center for World History](#)

[Dickens Project](#)

[Linguistics Research Center](#)

[Ray Film and Study Center](#)

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### PHYSICAL AND BIOLOGICAL SCIENCES DIVISION

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#### RESEARCH PROGRAMS AND CENTERS

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[Center for Adaptive Optics \(CfAO\)](#) (also see [lao.ucolick.org](http://lao.ucolick.org))

[Center for Molecular Biology of RNA](#)

[Center for Origin, Dynamics, and Evolution of Planets \(CODEP\)](#)

[Center for the Study of Imaging and Dynamics of the Earth \(CSIDE\)](#)

[Center for Remote Sensing \(CRS\)](#)

[Institute of Marine Sciences \(IMS\)](#)  
[Microbiology and Biomedical Research](#)  
[Institute for the Biology of Stem Cells \(IBSC\)](#)  
[Santa Cruz Predatory Bird Research Group](#)  
RESEARCH FACILITIES AND LABORATORIES

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[Chemical Screening Center \(CSC\)](#)

[Climate Change and Impacts Laboratory \(CCIL\)](#)

[Crustal Imaging Laboratory \(CIL\)](#)

[Earth System Modeling Laboratory](#)

[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](#)

[Paleomagnetism Laboratory](#)

[Rock Preparation Facility](#)

[Scientific Diving and Boating Safety](#)

[Stable Isotope Laboratory](#)

[UCSC Greenhouses](#)

[W. M. Keck Isotope Laboratory](#)

[W. M. Keck Seismological Laboratory](#)

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### SOCIAL SCIENCES DIVISION

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#### RESEARCH CENTERS

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[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 Statistical Analysis in Social Sciences \(CSASS\)](#)

[Chicano/Latino Research Center \(CLRC\)](#)

[Science & Justice Research Center](#)

[UC Santa Cruz Blum Center on Poverty, Social Enterprise, and Participatory Governance](#)

RESEARCH INITIATIVES

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[Bruce Initiative on Rethinking Capitalism](#)

[Everett Program](#)

[Institute for Scientist and Engineer Educators \(ISEE\)](#)

[South Asia Studies Initiative \(SASI\)](#)

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INTERDISCIPLINARY AND  
SYSTEMWIDE RESEARCH PROGRAMS  
AND RESOURCES

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[Arboretum](#)

[California Institute for Quantitative Biosciences \(QB3\)](#)

[Center for Biomolecular Science and Engineering  
\(CBSE\)](#)

[Center for Collaborative Research for an Equitable  
California \(CCREC\)](#)

[Center for Information Technology Research in the  
Interest of Society \(CITRIS\)](#)

[Educational Partnership Center \(EPC\)](#)

[Monterey Bay Education, Science, and Technology  
\(MBEST\) Center](#)

[Santa Cruz Institute for Particle Physics \(SCIPP\)](#)

[University Affiliated Research Center \(UARC\)](#)

[University of California Observatories \(UCO\)](#)

[University of California High-Performance  
AstroComputing Center \(UC-HiPACC\)](#)

Revised 09/01/15

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## STUDENT LIFE

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### 2015-16 General Catalog

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](#)) 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.

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### SANTA CRUZ COMMUNITY

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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 60,000, 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.

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### HOUSING

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At UC Santa Cruz, all 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.

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### COLLEGE RESIDENCES

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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 and lounge areas. 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. All-gender room assignments (allows transgender students and allies to live together in the same room, regardless of gender/biological sex) 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, The Village, 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

## Student Life

academic or personal concerns, and assist with roommate problems.

All housing contracts for residence halls and apartments at the colleges (including the Transfer Community) include meal plans. 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.

For more information on the colleges, refer to the brochure titled [UC Santa Cruz, The Colleges: Communities of Learning](#), or contact the [campus housing office](#).

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### REDWOOD GROVE

Located on the west side of campus between Kresge College and Graduate Student Housing, Redwood Grove is a quiet and studious apartment community for students from all colleges. Each apartment has private and shared bedrooms, a living room, kitchen, dining room, and bathroom. Information is available on the Web at [housing.ucsc.edu](#), and by e-mail at [redwoodgrove@ucsc.edu](#).

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### THE VILLAGE

Located in the Lower Quarry, The Village houses continuing and transfer 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 on the Web at [housing.ucsc.edu/village](#), and by e-mail at [village@ucsc.edu](#).

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### 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 on the Web at [housing.ucsc.edu/utc](#), and by e-mail at [utc@ucsc.edu](#).

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### FAMILY STUDENT HOUSING

Family Student Housing, located on the west side of campus, 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 childcare and youth programs, [below](#). Information is available on the Web at [housing.ucsc.edu/family](#), and by e-mail at [fsh@ucsc.edu](#).

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### CAMPER PARK

The 42-space Camper Park on the north side of campus is available to students who own recreational vehicles. All have water and electrical hookups; eight also have sewer hookups. The community includes a small central facility with rest rooms, showers, a meeting room, and a laundry room. Information is available on the Web at [housing.ucsc.edu/camperpark](#), and by e-mail at [camperpark@ucsc.edu](#).

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### 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 on the Web at [housing.ucsc.edu/gradhousing](#), and by e-mail at [gradhsg@ucsc.edu](#).

Web: [housing.ucsc.edu/gradhousing](#)

E-mail: [gradhsg@ucsc.edu](#)

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### CAMPUS HOUSING OFFICE

The Campus 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 on the Web at [housing.ucsc.edu](#), and by e-mail at [housing@ucsc.edu](#).

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### 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.

Locating suitable housing in the Santa Cruz area can take from one to four weeks, depending on specific requirements and restrictions. Average rental rates are available at [housing.ucsc.edu/cro/costs.html](#).

Location: 104 Hahn Student Services (8 a.m. to 5 p.m., Monday through Friday) Information is available on the Web at [communityrentals.ucsc.edu](http://communityrentals.ucsc.edu), and by e-mail at [communityrentals@ucsc.edu](mailto:communityrentals@ucsc.edu).

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## THE OFFICE OF PHYSICAL EDUCATION, RECREATION AND SPORTS (OPERS)

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Physical education classes, recreation, sports, and fitness programs at OPERS provide a variety of interesting and challenging activities intended to attract you to becoming an active participant. The emphasis is on giving you an opportunity to develop knowledge, skills, and habits related to wellness that last through a lifetime of enjoyable physical and recreational activity.

Obtain further information about the programs described below from the Office of Physical Education, Recreation, and Sports, located at the East Field House, (831) 459-2531. Web: <http://opers.ucsc.edu>

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### PHYSICAL EDUCATION COURSES

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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](#)). Many classes are small, and all offer expert instruction and carefully designed practice periods so that you can accomplish much in sessions of two to three hours per week. Most activities have intermediate and advanced sections as well as courses for beginners. Subjects offered include swimming, scuba, sailing, rowing, kayak, basketball, racquetball, tennis, volleyball, ballet, folk dance, jazz dance, modern dance, fencing, soccer, tai chi chuan, strength training, fitness and conditioning, yoga, aikido, and tae kwon do. Web: <http://opers.ucsc.edu/>

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### INTRAMURAL SPORTS

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The intramural sports program includes competitive leagues, tournaments, and special one-day events. Many of the activities are coeducational. The leagues feature basketball, flag football, dodgeball, indoor and outdoor soccer, softball, indoor and outdoor volleyball, ultimate Frisbee and innertube water polo. Some of the leagues are divided into different skill levels. Special events include a 5-mile run. Prospective participants are encouraged to form their own teams. Individuals looking to be placed on a team are also welcome (but there is no guarantee of team placement). Web: <http://opers.ucsc.edu/intramurals/index.html>

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### SPORTS CLUBS

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The sports club program offers a variety of activities depending on student interest. Currently, active clubs

include men's and women's rugby, men's and women's water polo, men's and women's ultimate frisbee; men's soccer, baseball, and lacrosse; coed cross-country and track and field; coed Special Olympics; and coed cheerleading, dance, equestrian, triathlon, disc golf, cycling, sailing, badminton, and fencing. Web: <http://opers.ucsc.edu/sports-clubs/index.html>

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### INTERCOLLEGIATE ATHLETICS

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UC Santa Cruz offers the only National Collegiate Athletic Association (NCAA) Division III program in the UC system. As a Division III member, the program offers no scholarships or grants in aid that are based on athletic ability. UCSC sponsors the following intercollegiate sports: men's and women's basketball, soccer, swimming and diving, tennis, volleyball, and cross country, and women's track and golf. For information on teams, rosters, schedules, and the Slug Booster Club, go to [www.goslugs.com](http://www.goslugs.com).

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### RECREATION PROGRAM

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The Recreation Program is designed to fulfill the diverse needs and interests of all members of the UCSC community. More than 100 activities, workshops, classes, adventure outings, custom trips, and special events are scheduled quarterly. Other programs include the Experiential Leadership Program, a fun, well-supported training ground to explore new interests, meet new people, build skills, and gain confidence; the Holistic Health Program, which provides integrated training in the healing arts; and the Wilderness Orientation Program, which offers a 10-day Wilderness Orientation (WO) prior to the start of school. WO is an invaluable experience for incoming college students, serving as an introduction to mountain travel and the "journey" of college education. The beautiful settings of the Sierra Nevada provide students an opportunity to form new friendships and discuss their hopes and fears about entering college while learning outdoor skills. No previous backpacking experience is necessary.

The Outdoor Equipment Rental Center offers recreational equipment including surfboards, wetsuits, and high-quality backpacking and camping gear. If you are interested in planning your own outing, contact the Recreation Program Office for assistance. The office has extensive files, and staff members act as consultants, planning with people as well as for them. The office also provides bicycle licensing and offers a free weekly drop-in bicycle maintenance program. Open recreation hours are scheduled quarterly; you are strongly encouraged to use the facilities. Sports equipment may be borrowed without charge. There are also recreation clubs if you are primarily interested in organized recreation and individual performance. Clubs are coed

## Student Life

and feature some combination of recreational participation, advanced instruction, and individual competition. Web:

<http://recreation.ucsc.edu/index.html>

### BANANA SLUG MASCOT

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The Banana Slug, a bright yellow indigenous gastropod found in the campus's redwood forest, was the unofficial mascot for UCSC's coed teams beginning in the university's early years. In 1981, when some campus teams wanted more organized participation in extramural competition, UCSC joined Division III of the NCAA. Since the application required an official team name, UCSC's then-chancellor polled the student players, and out of this small group emerged a consensus for a new moniker—the sea lions. It was a choice that the chancellor considered more dignified and suitable to serious play than the Banana Slugs. But the new name did not find favor with the majority of students, who continued to root for the Slugs even after a sea lion was painted in the middle of the basketball floor. After five years of dealing with the two-mascot problem, an overwhelming pro-Slug straw vote by students in 1986 convinced the chancellor to make the lowly but beloved Banana Slug UCSC's official mascot.

### FACILITIES

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To make it convenient for you to utilize campus physical education, recreation, and sports facilities, field houses are located on the east and west sides of the campus. At both the East Field House and the West Field House, you will find the following: gymnasium, tennis courts, outdoor basketball and volleyball courts, and locker rooms. The East Field House also has the Wellness Center, which offers two floors of state-of-the-art cardiovascular and strength-training equipment, a dance studio, the martial arts room, handball/racquetball courts, equipment center, 50-meter swimming pool, half-mile jogging track, and sports fields. An outdoor strength-training and cardiovascular-fitness court is located near the east jogging track. In addition, personal training and drop-in fitness classes are offered through FitLife. More information is available on the [FitLife web site](#).

The UCSC Boating Center is located on FF Dock at the Santa Cruz Small Craft Harbor. The boating program offers PE instruction as well as a boating club with boat usage for students and community members alike. Boating courses are offered for dinghies, 24'–32' keel boats, sea kayaks, and rowing shells. Web: <http://boating.ucsc.edu/>.

### SUSTAINABLE LIVING CENTER PROGRAMS

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**[Program in Community and Agroecology \(PICA\)](#)**, 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 web site](#).

**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 opportunities, intercultural exchanges, research, and the annual Agroecology Shortcourse 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

## Student Life

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.

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### STUDENT-RUN COOPERATIVES

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#### KRESGE FOOD CO-OP

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**Mission statement:** “We are a group of students whose goal is to run a natural food store through consensus decision-making and group responsibility. We embrace cooperation as our tool for social change. We are not for profit; we are for collective power. As a cooperative business we seek to educate all members of the community, including ourselves. We use our buying power to reflect our ideals regarding ecological, social, and political issues. For this reason we carry healthful, locally based, cruelty-free, organic products. We focus on products that are good for the earth, the people who produce them, and the people who consume them. Open to all, we provide a space where good food and revolutionary action meet at the checkout line.” Call (831) 426-1506 for more information.

#### BIKE CO-OP

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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 is located at the Student Union. Note: this building may be under construction during the 2015–16 year. Please call for updates and possible temporary location. **Note:** this building may be under construction during the 2015–16 year. Please call for updates and possible temporary location. For information, come by or call (831) 457-8281.

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### TRANSPORTATION AND PARKING SERVICES (TAPS)

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The UC Santa Cruz campus is designed to preserve the natural beauty of our magnificent setting and strives to minimize automobile traffic and congestion. Because parking is such a limited resource, the majority of campus parking spaces are available only to commuting students, faculty, staff, and visitors. **UCSC has a parking prohibition for first and second year residential students;** students with fewer than 90

units who live in university housing facilities are not eligible to purchase a campus parking permit. Parking regulations are strictly enforced; all students who bring a car to campus must purchase a permit in advance. UCSC requests that students not bring vehicles to campus if they are not eligible to purchase an on-campus parking permit. For additional information, visit [the TAPS web site](#).

#### TRANSPORTATION OPTIONS

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**Airports and Long-Distance Bus Service:** The nearest commercial airport is in San José, approximately 35 miles from Santa Cruz. The San Francisco Airport is about 70 miles from campus. Both airports are accessible by commercial van and limousine services. Santa Cruz is also served by commercial bus lines on a regularly scheduled basis.

**Campus Transit:** On-campus buses and paratransit services are provided on a no-fare basis; these services are supported by the mandatory Student Transit Fee. TAPS buses 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. TAPS also operates a Night Owl service to transport UCSC affiliates between the campus and downtown Santa Cruz. The Night Owl operates until 1:15 a.m. Sunday through Thursday, and until 2:50 a.m. on Friday and Saturday.

**Metro Buses:** Santa Cruz Metro Transit District is the bus service provider for Santa Cruz County. Metro operates over 35 bus routes throughout the county, including six routes to and from UC Santa Cruz. UCSC students can ride Metro buses throughout the county by showing a student ID card with a current quarter validation sticker; no additional fare is required to ride.

**Bike Program:** TAPS offers a variety of programs to support those who choose bicycles as their main mode of travel, including over 3,500 bike-rack spaces, bike "fix-it" stations, free weekly bike repair and maintenance clinics, free (required) bike licensing, and morning bike shuttles that run from two off-campus locations up to campus. Popular student-run bike services include the Bike Library (where you can borrow a bike on a quarterly basis for free) and the Bike Co-op (a not-for-profit, full-service bike shop located near the Bay Tree Bookstore).

**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 \$7.50 per hour and include all vehicle fees, gas, insurance, mileage, and reserved parking on campus. Members have access 24 hours per day to 21 vehicles—11 on campus and 10 at other nearby Santa Cruz

locations. For detailed information, visit <http://www.zipcar.com/ucsc>.

**Ridematching:** Zimride is a social networking ridematching program exclusive to the UCSC community. You can find someone to share your regular commute or one-time trip through Zimride, even if you don't have a car—just post the ride you need. If you have a car, you can share your Zipcar trip with others and save on costs. For more information, go to <http://zimride.ucsc.edu>.

**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.

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## STUDENT HEALTH SERVICES

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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 have access to the Student Health Center regardless of their insurance plan, as services are partially supported by their Student Services fee. Care is provided by board-certified physicians, nurse practitioners, and physician assistants. Students can be seen by appointment or, in cases of acute 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, visit the Student Health Center's web site. For more information, visit the [Student Health Center web site](#), or e-mail [healthcenter@ucsc.edu](mailto:healthcenter@ucsc.edu).

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## STUDENT HEALTH INSURANCE

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To ensure that emergencies and other health care costs do not interfere with a student's education, all University of California students are required to carry medical 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 by the specified deadline. For detailed information regarding insurance coverage and

the waiver process, visit <http://healthcenter.ucsc.edu/billing-insurance/index.html>. You may also contact the insurance office at [insure@ucsc.edu](mailto:insure@ucsc.edu) or (831) 459-2389.

Fees will be assessed for most visits for students without UC SHIP.

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## MANDATORY HEPATITIS B IMMUNIZATION

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California state law mandates that all entering students under 19 years old must be immunized against Hepatitis B. These students are required to provide the Student Health Center with documentation proving their compliance with this law. Those not in compliance at the beginning of the quarter may be dropped from their classes. For more information, visit [healthcenter.ucsc.edu](http://healthcenter.ucsc.edu) or call (831) 459-2211.

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## STUDENT HEALTH OUTREACH AND PROMOTION (SHOP)

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SHOP is UC SantaCruz's destination for health-related information, conversation, and self-exploration. It's the place for students to learn about health and wellness in a safe, non-judgmental environment. SHOP does not tell people what we think they should or shouldn't do. We help students do what they choose to do in the safest way that they can.

SHOP offers information, education, resources, and support on issues related to alcohol and other drug use; sexuality and sexual health (including HIV and other sexually transmitted infections); safer sex; unplanned pregnancy and contraception; and sexual assault and violence prevention. Students can get involved with SHOP by becoming peer educators, HIV test counselors, volunteers for the Condom Co-op, and/or CUIP interns.

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## Alcohol and Other Drug (AOD) Education

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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. Staff also serve on the campuswide AOD Advisory Committee, which develops, implements, and assesses policies. For information call (831) 459-1417 or visit the [SHOP web site](#). **NOTE:** In January 2014, UC Santa Cruz implemented a campuswide smoke and tobacco-free policy.

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## HIV and Other Sexually Transmitted Infection (STI) Prevention

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## Student Life

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.
- Workshops, activities, and events.
- Sexual health questions? SHOP has many resources.

### **Sexual-Assault Facts and Education (S.A.F.E.)**

The Sexual Assault Facts and Education program at the Student Health Center provides confidential support, information, and resource referrals to survivors of sexual violence, dating violence, and stalking. An experienced sexual violence prevention educator and advocate is available for individual appointments and provides nonjudgmental support for those who have experienced sexual assault, dating violence, or stalking. These resources are also available for their friends and loved ones. The sexual violence prevention educator and advocate is certified as a crisis counselor by the state of California and can be reached at (831) 459-1053. Police officers are available 24 hours a day, as are emergency phones, guards at campus entrances from 8 p.m. until 3 a.m., and frequent shuttles and buses.

Since 1979, UCSC has actively addressed issues related to sexual violence on campus. Students are required to take an online education course and to attend educational presentations that encourage respect, responsibility, and bystander intervention among students. Workshops are organized in the residence halls, and a variety of educational resources are available for all students.

SHOP is located at the Student Health Center. For more information, visit the [SHOP web site](#), call (831) 459-3772 or e-mail [shop@ucsc.edu](mailto:shop@ucsc.edu).

### **COUNSELING AND PSYCHOLOGICAL SERVICES**

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. 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 a student 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, the Academic Resource Center, 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 web site](#) or call (831) 459-2628.

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## RESOURCE CENTERS

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### **AFRICAN AMERICAN RESOURCE AND CULTURAL CENTER (AARCC)**

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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 hosts a number of topical groups to allow for engagement and interaction, such as Sisters' Corner and Black Men's Initiative. Other student organizations that AARCC works closely with 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.

## Student Life

AARCC works collaboratively with various campus units/departments and in the surrounding community to enhance cultural and ethnic diversity initiatives on the UCSC campus. The center is located on the third floor of the Bay Tree Building in Quarry Plaza, and is open Monday through Friday from 8 a.m. to 5 p.m. For more information, call (831) 459-2427, fax (831) 459-2469, e-mail [aarcc@ucsc.edu](mailto:aarcc@ucsc.edu) or visit [the AARCC web site](#).

### 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 (SANAI), 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, e-mail [airc@ucsc.edu](mailto:airc@ucsc.edu), or visit [the AIRC web site](#).

### ASIAN AMERICAN/PACIFIC ISLANDER RESOURCE CENTER (AA/PIRC)

The Asian American/Pacific Islander Resource Center (AA/PIRC) provides and enhances opportunities for education and dialogue on issues affecting Asian Americans and Pacific Islanders, as well as opportunities for leadership development and community building. AA/PIRC aims to address students' multiple and diverse academic, social, cultural, and other co-curricular needs through programs and services. Programs include Asian American/Pacific Islander Heritage Month, Year-End Ceremony for graduating seniors, topical workshops, performances, and presentations by community leaders. Students also gain professional experience through AA/PIRC-sponsored academic and paid internships.

AA/PIRC is located on the third floor of the Bay Tree Building at the Ethnic Resource Centers. Add your e-mail address to AA/PIRC's listserv to receive campus and community announcements. For more information, call (831) 459-5349; e-mail [aapirc@ucsc.edu](mailto:aapirc@ucsc.edu); or visit them on [Facebook](#), or see the [AA/PIRC web site](#).

### CHICANO LATINO RESOURCE CENTER (EL CENTRO)

The Chicano Latino Resource Center (El Centro) is a hub of organized activities and resources that support Chicano and Latino 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: New Student Welcome Program; Día De Los Muertos; Pachanga; César Chavez Convocation; dialogue on academic, social, cultural, and personal issues that affect the Chicano and Latino community; 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 e-mail [elcentro@ucsc.edu](mailto:elcentro@ucsc.edu). Web: [the El Centro web site](#).

### GAY, LESBIAN, BISEXUAL, TRANS\*, INTERSEX (GLBTI) RESOURCE CENTER

The Lionel Cantú Gay, Lesbian, Bi, Trans\*, Intersex (GLBTI) Resource Center (aka the Cantú Queer Center), housed in a beautiful cabin in a redwood glen near Crown and Merrill Colleges, is a friendly, welcoming space for the entire community. The center's mission is to provide educational, psychosocial, advocacy, and supportive services to students, staff, faculty, and alumni on GLBTI issues. The Cantú Queer Center is home to several student organizations that meet weekly; a host of exciting programs; the GALA art gallery; and a library offering 3,000 books, magazines, and films. Information and referral to campus and community resources is available by phone or in person. Throughout the year, the Cantú Queer Center coordinates student programming with a queer focus—beginning with National Coming Out Day in the fall and culminating in the Rainbow Graduation Ceremony in the spring. Education of the entire campus population is another function of the resource center; the Cantú Queer Center's professional staff members offer workshops/trainings for groups, classes, and dorms on a range of GLBTI topics. Everyone is welcome to use the center's cozy lounge, full kitchen, and computer corner to study, relax, socialize, and become involved in the campus's queer community. The center is open Monday through Friday; usual hours are 9 a.m. to 5 p.m. Stop by and meet the center's friendly, knowledgeable staff.

## Student Life

Come discover why UCSC has been consistently rated one of the best-of-the-best universities for queer students! You can reach the center at (831) 459-2468 or via e-mail at [queer@ucsc.edu](mailto:queer@ucsc.edu). The [center's web site](#), provides an overview. Self-subscribe to QConnect, the center's e-newsletter and calendar, on the site's home page.

### WOMEN'S CENTER

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**Note:** The Women's Center's temporary location (until January 2016) is at the Granary, near the main UCSC entrance, across from the Barn Theater. The center's permanent location is at Cardiff House, an historic farmhouse between the Carriage House and UCSC Police Department

The Women's Center is devoted to helping students maximize their academic and personal success at UCSC. The center is a student-run community-service resource center that creates and sponsors student-oriented programs, workshops, writing collectives, support groups, and discussions throughout the academic year on topics ranging from women's leadership and empowerment, gender and sexuality, race and culture, sexual assault, domestic violence, healthy sexuality and relationships, positive body image, health and wellness, and much more. Resource referrals and informal advising are also available.

Students can get involved in Women's Center annual programs, such as Domestic Violence Awareness Month, Sister Solidarity (Women's Heritage Month), Take Back The Night, Sexual Assault Awareness Month, and can also collaborate on programs and projects with the support and mentorship of staff.

Other opportunities for involvement include internships, work-study jobs, volunteering, and independent study. The Center is the ideal space to study, relax, and connect with students, staff, faculty, and community members.

For more information call (831) 459-2072, e-mail [women@ucsc.edu](mailto:women@ucsc.edu), or visit the [Women's Center web site](#). Women's Center hours are Monday through Friday, 9:00 a.m. to 5:00 p.m.

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### THE STUDENT UNION

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**NOTE:** The Student Union may be under construction during the 2015–16 year. Please call for updates and possible temporary locations.

The Student Union is a student-governed facility where students can take a break and lounge, play pool or ping-pong, use computers, meet, 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 government (Student Union Assembly) and 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.

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### STUDENT ACTIVITIES

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#### CAMPUSWIDE STUDENT ACTIVITIES: SOMECA

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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 instruction, mentorship, leadership training, organizational development advising, and project management to all students. Visit: <http://someca.ucsc.edu>.

#### STUDENT ORGANIZATION ADVISING AND RESOURCES (SOAR)

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UCSC offers the student body over 150 student-initiated organizations, including cultural, social, political, religious, academic, ethnic, and environmental organizations, as well as fraternities and sororities. Participating in a UCSC student organization provides valuable experience in leadership and teamwork and develops a network of rewarding and lifelong friendships.

UCSC student organizations govern large-scale and established programs. 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. These are just a few examples of organization experiences that contribute to UCSC students becoming more self-directed, connected, and successful in pursuing their studies and careers.

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, e-mail [soar@ucsc.edu](mailto:soar@ucsc.edu), or visit [the](#)

## Student Life

[SOAR web site](#). SOAR is located on the second floor of the Student Union.

### STUDENT MEDIA

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Student Media at UC Santa Cruz include 20 print publications and campus Student Cable Television (SCTV). 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 Third World and Native American Students Press Collective, publishes a newsmagazine that seeks to broaden awareness of perspectives of color in the campus community. Other campus magazines include the critical film journal, EYECANDY; LEVIATHAN JEWISH JOURNAL; and GAIA, which focuses on environmental issues; and the DISORIENTATION GUIDE. 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 Banana Slug News, Rainbow TV, Film Production Coalition, On the Spot, and others. Many of the participating students are affiliated with UCSC's Film and Digital Media major; however, 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 web site](#) for links to print, radio and broadcast organizations.

### CULTURAL ARTS AND DIVERSITY (CAD)

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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 web site at: [CAD web site](#).

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## UC SANTA CRUZ AND SYSTEMWIDE STUDENT GOVERNANCE

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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

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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 (chair, internal vice chair, external vice chair, organizing director, commissioner of academic affairs, and commissioner of diversity); 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; The Queer Student Union; Movimiento Estudiantil Chicano de Aztlan; Student Alliance of North American Indians; and Ethnic Student Organization Council. The SUA also provides paid part-time internship opportunities for students each year. 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 6 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 have been fighting to make a UC education affordable, fighting to stop balancing budgets on the backs of students,

## Student Life

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 system, state, and national issues. For more information, visit the [SUA web site](#).

### SYSTEMWIDE STUDENT GOVERNMENT: UCSA

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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. UCSA coordinates the yearly selection of the UC Student Regent.

The SUA external 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 external vice-chair (EVC) 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 EVC to effectively run the grassroots campaigns that are sponsored by UCSA every year. These positions are elected for one-year terms during spring quarter every year.

The Student Union Assembly's executive vice chair may be contacted at [suaevc@ucsc.edu](mailto:suaevc@ucsc.edu).

### COLLEGE STUDENT GOVERNMENTS

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Each college has its own form of student government, enabling students to gain experience in planning,

budgeting, implementing, and evaluating a wide range of college programs and policies. Like the colleges themselves, each college governing body has its own character, structure, and meeting times and dates. For information, inquire in your college office or talk to our college programs coordinator.

### THE GRADUATE STUDENT ASSOCIATION (GSA)

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The Graduate Student Association (GSA) provides governance and representation for graduate student interests with regard to tuition and fees, health insurance, parking, on-campus housing, and other important issues. The current key goals of the GSA is to work with administration to close the stipend gap, obtain guaranteed funding for normative time, establish affordable and dignified housing, and to shift the current campus climate in order to provide more support for underrepresented and marginalized graduate students. The GSA makes available quarterly travel grants for graduate students attending conferences or traveling on thesis-related research. The GSA also organizes and co-sponsors events campuswide, in addition to offering annual graduate student and solidarity orientations. The GSA is strongly committed to working toward intellectual and social diversity, including advocating for and working with underrepresented groups at the university. The GSA meets bi-weekly to strategize around and discuss issues impacting graduate students. For more information, contact the GSA ([GSA web site](#)), or visit our office at the Graduate Student Commons.

### STUDENT REPRESENTATION ON CAMPUSWIDE COMMITTEES

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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 Internal Vice-Chair 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 web site](#).

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## COMMUNITY SERVICE OPPORTUNITIES

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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 web site [volunteer.ucsc.edu](http://volunteer.ucsc.edu) or contact the Student Volunteer Center at (831) 459-3364 or e-mail [volunteer@ucsc.edu](mailto:volunteer@ucsc.edu).

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## CAMPUS CULTURAL PROGRAMS

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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 several theater, dance, and music presentations, are offered in conjunction with the academic programs. In addition, the Arts Division 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 activities 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](http://arts.ucsc.edu) and on [Facebook](https://www.facebook.com/ucscarts).

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## BAY TREE BOOKSTORE

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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, 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, and limited check cashing. The bookstore also houses the campus's convenience store (the Express Store) and Student ID Card Services. For more information, call (831) 459-4544, or see the [Bay Tree Bookstore web site](http://baytreebookstore.ucsc.edu).

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## CHILD CARE AND EARLY EDUCATION SERVICES

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Child Care and Early Education Services offers programs for children of students currently enrolled in classes at UCSC. All of our centers are conveniently located on campus near the West Entrance. Free or low-cost tuition rates are available for students who meet the eligibility requirements for subsidized care (please see Eligibility for State Funding Chart at [childcare.ucsc.edu](http://childcare.ucsc.edu). 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. The curriculum emphasizes play as a learning process and provides environments that are rich and challenging.

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 of our centers are 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

## Student Life

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 [childcare.ucsc.edu](http://childcare.ucsc.edu) and at the Early Education Services Office in the Community Building at Family Student Housing; at (831) 459-2967, or by e-mail at [earlyeducation@ucsc.edu](mailto:earlyeducation@ucsc.edu).

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### INFANT CENTER

The Infant Center serves 12 children ages 11 to 24 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 6:15 p.m.

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### PRESCHOOL CENTER

There are three preschool classrooms that serve a total of 36 children from 24 months until they enter kindergarten. Each classroom provides small groups with low child-to-adult ratios, and an environment that provides a stimulating and rich curriculum, which helps prepare children for kindergarten. The hours of operation are 7:30 a.m. to 6:15 p.m.

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### SCHOOL AGE CENTER

The School Age Program serves 16 children. It operates as an after-school recreation program 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 noon to 6:15 p.m. for kindergarteners; and 2:30 p.m. to 6:15 p.m. on Mondays, Tuesdays, Thursdays, and Fridays for 2nd through 5th graders. On Wednesdays (public school minimum days), care is available from 12 noon to 6:15 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).

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## UCSC ALUMNI ASSOCIATION

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UCSC's graduates—more than 96,000 of them—can maintain a lifelong connection to the campus through the UCSC Alumni Association. Through the dues they pay, Association members contribute to the living-learning environments at each college and the enrichment of the entire campus. Membership dues directly support student programs, special activities, and other projects at the colleges and campuswide.

The association sponsors programs that engage and reconnect alumni with each other and the campus, fostering the banana slug network. Hundreds of alumni

return to campus during the annual Alumni Weekend to enjoy receptions, tours, panel discussions, and other programs through which they reconnect with old friends, faculty, and students. Thousands more reconnect through the Online Alumni Directory. Many alumni also reconnect at regional events across the country and through association-sponsored affinity groups.

The Alumni Association also connects alumni and students through career programs. Alumni act as career mentors online and in person at the annual Multicultural Career Conference and similar events. The association promotes excellence at UCSC by making annual awards. It supports students by offering two types of scholarships (college service and financial need), and enriches campus and college intellectual life through its Distinguished Visiting Professor program and endowment.

The Alumni Association, in partnership with other UC Alumni Associations, brings politically minded graduates to Sacramento for an annual legislative conference aimed at increasing support for UC.

Information about the Alumni Association is available by contacting us at 1156 High Street, Santa Cruz, CA 95064, locally at (831) 459-2530, toll-free at (800) 933-SLUG, via e-mail at [alumni@ucsc.edu](mailto:alumni@ucsc.edu), and on the web: [Alumni Association web site](http://Alumni Association web site).

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## UNIVERSITY INTERFAITH COUNCIL

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The University Interfaith Council (UIC) seeks to integrate spirituality with academic life and to promote tolerance, peace, and understanding of all faiths and spiritual traditions. The UIC is open to all religious groups. Programs include celebrations and interfaith gatherings; educational events, including religious study courses; community service; worship/meditation; and spiritual care and counseling for students, faculty, and staff. The UIC strengthens a campuswide sense of spirituality and increases awareness of options for spiritual life on campus. For more information on University Interfaith Council events and discussion boards, visit the [UIC web site](http://UIC web site).

Revised: 09/01/15

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## THE COLLEGES

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### 2015-16 General Catalog

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 faculty and staff who provide academic support, organize student activities, and sponsor events that 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](#), [College Eight](#), [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 1,400 and 1,700 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 web sites, 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

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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 single, double, and triple 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. Professional staff (coordinators of residential education) work with students trained as resident assistants and help organize activities and events, provide referral information about academic or personal concerns, and assist with roommate problems.

### CHANGING COLLEGES

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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.

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## COWELL COLLEGE

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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

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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 its 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, Cowell 80, is taught in small seminar sections and seeks to develop critical reading, analytical writing, and seminar discussion skills by reading 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.

### HONORS PROGRAM

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Cowell participates in the UCSC First-Year Honors Program. Each year a small set of students who demonstrated high academic achievement in high school is invited to join the university-wide program. Cowell hosts one cohort group, with members housed together in one of the residence halls. In the fall of their first year, the students take a special advanced section of the core course. During the winter, they chose one of the honors program seminars, which are offered by the colleges participating in the program. During the spring, all students in the program take a special two-credit class together, which includes special lectures and dinners.

### COLLEGE COMMUNITY AND FACILITIES

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Cowell's seven residence halls and three apartment buildings are arranged in three quadrangles on a hillside overlooking the city of Santa Cruz and Monterey Bay. About 700 students are housed in the college. Most floors are mixed gender with all students sharing common lounges and other facilities, but single-gender floors are provided for those who prefer this arrangement. Apartments house continuing students, mostly juniors and seniors. The residential staff members facilitate diverse educational, social, and recreational programming to enhance the living and learning environment.

Arranged around the college's central courtyard are the dining hall, the Page Smith Study Library, the fireside lounge, the coffee shop, and conference rooms 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 are the Cowell Galleries, including the Eloise Pickard Smith Gallery and the Annex Gallery.

## The Colleges

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 Student 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 web site](#) or call (831) 459-2253.

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### COWELL FELLOWS AND STAFF

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Cowell College faculty fellows are listed [here](#).  
College staff are listed [here](#).

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## STEVENSON COLLEGE

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**“We are Stevensonians; we are free agents of history and masters of our own destinies. Every one of us is important, and we cherish our differences as much as we cherish our shared values of love, chivalry, honesty, hard work, and responsibility.”**

—Seung Kyun Joseph Mok, Stevenson  
Alumnus/Regents Scholar

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, and respect for students' concerns about shared student governance, human rights, and social justice.

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 has brought to the campus distinguished individuals such as Senator George McGovern, Congresswoman Bella Abzug, Nobel Laureate Elie Wiesel, Chief of the Miwok Tribe Greg Sarris, Producer Lourdes Portillo, and Associate Director-Counsel Theodore M. Shaw of the NAACP Legal Defense and Educational Fund.

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.

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### ACADEMIC EMPHASES

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- Faculty drawn from social sciences, humanities, and natural sciences

- Two-quarter frosh core course
- Writing Assistants
- Junior Fellows Program

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. 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 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, writing, 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; lower-division transfer students who, prior to enrolling, have not completed at least one UC-transferable college English composition course with a minimum grade of C (2.0) are able to take the core course to satisfy the C1 requirement. Stevenson alumni can be found in legal, political, educational, engineering, medical, computer and information sciences, business, and public administration careers, among others.

The Stevenson core course, *Self and Society*, enables students to examine the nature of the self and the relationship of the individual to society. 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

## The Colleges

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.

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 Michele Guard Memorial Scholarship, the Matthew Graviano Memorial Scholarship, the John Halverson Scholarship, the Sandor Callahan Scholarship Award, and the Robert Dodge Service Award.

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.

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.

### COLLEGE COMMUNITY PROGRAMS

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- College Nights
- Stevenson Student Council
- Stevenson Ethics Bowl Team
- Multicultural Advisory Committee (MAC)
- Path to a Greener Stevenson (PTAGS)
- Social and Multicultural Programs/Activities
- Stevenson Housing Association (SHA)
- Rainbow Theater

Stevenson holds regular College Nights, where joining together for a special dinner presents an opportunity for Stevenson faculty, staff, and students to get together in a social context. College Nights—such as Cinco de Mayo, Chinese New Year, and Vietnamese College Night—provide the opportunity to celebrate many different cultures. Dinner is followed by entertainment.

The Stevenson Student Council meets on Thursday evenings. 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 campuswide issues and appoints student representatives to college and campuswide committees.

## FACILITIES

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- Eight small residence halls, four of which are themed houses:
  - Outdoor Adventure House
  - Sustainability House
  - Diversity and Social Justice House
  - The Rosa Parks African American Theme House
- Three apartment buildings
- Coffee house
- Wagstaff Fireside Lounge
- Writers' Center
- Stevenson Library
- Stevenson Event Center
- Silverman Conference Room
- Recreation room

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 156 continuing students. Nearby are a picnic area, playing fields, and a garden.

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, foosball, pool tables, and television. 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 web site](#) or call (831) 459-4930.

### STEVENSON COLLEGE FELLOWS AND STAFF

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Stevenson College faculty fellows are listed [here](#).

College staff are listed [here](#).

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## CROWN COLLEGE

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Crown College faculty and students represent a wide variety of academic disciplines. The majority of the faculty teaches in the physical, biological and social sciences. Although Crown has more science and engineering students than any of the other colleges, most of Crown's students major in the social sciences, humanities, and arts. This diversity of interests and academic training enriches our intellectual environment. An important goal of the college is to foster an appreciation for the contributions of diverse cultural groups and to provide an atmosphere in which issues of both diversity and common social purpose are integrated into a wide range of programs and discussions.

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

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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.

In the 2014–15 academic year, the Crown College core course became a two-quarter sequence. Our students take the two-unit Crown 79, Engaging the University, in the fall. This class alternates guest speakers with discussion sections in small groups under the direction of an instructor. The goal is to create a cohort experience and provide personalized mentorship for our entering students, to introduce students to the university, and to prepare students to take winter quarter sections of Crown 80A/B. Crown 80A/B, Ethical Issues in Emerging Technologies, is an interdisciplinary seminar concerning the effects of world-changing technologies. The course examines these technologies' impacts on society using a variety of disciplinary

approaches that engage the perspectives of both humanists and scientists. This class encourages students to examine the impact of new technologies through a critical lens and to present their conclusions at a capstone conference, the Social Fiction Conference. With a focus on the intersection of social justice topics in science fiction, fantasy, and gaming, this conference features keynote speakers, movies, debates, and presentations in a variety of formats. Both the fall and winter core courses are required of all non-transfer students during their first quarters at UCSC. As with the core courses from our sister colleges, the development of critical reading and writing skills is a major thrust of Crown 79, 80A, and 80B.

Crown emphasizes experiential learning through the college's Leadership Certificate Program, which combines leadership theory with a variety of internship opportunities and through support for research. Crown facilitates the establishment of internships with faculty fellows through advertising of individual projects and by providing funding to support them.

In addition, Crown College offers the First-Year Honors Program and the Science/Engineering Learning Communities. The First-Year Honors Program is an innovative program that offers a congenial and challenging academic home for a select group of well-prepared students at UC Santa Cruz. The enriched program of study includes special courses, seminars, colloquia, and other events during each quarter of the academic year. Admission to the First-Year Honors Program is by invitation during the admissions process based on high school academic performance.

The Crown Science Learning Community (SLC) is an innovative program that provides extra support to first-year students who are interested in pursuing a major in engineering and the sciences. Students enrolled in this program live together, forming a supportive community that promotes collaborative learning and group problem solving. To facilitate this process, SLC students are placed in a special section of Chemistry 1A or Math 3 and participate in a residentially based study group. The program is designed especially for students who have a strong interest in the sciences but feel slightly under-prepared for university-level coursework. It often acts as a bridge to the ACE Program in the physical and biological sciences and engineering. Participation—limited to first-year students at Crown

## The Colleges

College—requires a commitment to succeed, a willingness to work hard, and a positive attitude.

Similar to the Science Learning Community, Crown's Baskin Scholars Community focuses on underrepresented student success in engineering. Participants are housed together and receive tutoring, mentoring, and other assistance.

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### COLLEGE COMMUNITY AND FACILITIES

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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 his or her research.

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. At the monthly College Night in the dining commons, a special dinner is followed by entertainment, both often sharing a common cultural theme. Some major events have become a tradition: for example, Epic Game Tournaments, the Crown Semi-Formal, and quarterly Regression Nights. Crown activities and dances draw students from all over campus. Outdoor activities organized by the student government, the College Programs Office, or residential staff range from whale watching on the Monterey Bay to ultimate Frisbee, and from backpacking to stargazing.

The Crown Student Senate (CSS), the elected student government at Crown, holds open weekly meetings to recommend fund allocations for student activities and to discuss issues of concern to students and the college. CSS also sponsors events to enhance the college experience, including the very popular Casino Night.

Crown offers two types of residential facilities: residence halls and apartments. Eight traditional residence halls each house approximately 60 students in single, double, and triple rooms in a coed environment (single-gender bedrooms with unisex bathrooms) or on a few all-female floors. For students particularly interested in living with and learning about a special-interest environment, Crown provides the Gaming House, Outdoor Pursuits and Academic Success Houses, Arts & Humanities House, the Science and Engineering Learning Communities, and continuing student houses.

The college also has apartments for approximately 230 third- and fourth-year 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 modern computer laboratory housing 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 flatscreen 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, hold meetings, 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 web site](#). For residential information, call the Housing and Residential Education Office at (831) 459-5689.

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### CROWN FELLOWS AND STAFF

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Crown College faculty fellows are listed [here](#). College staff are listed [here](#).

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## MERRILL COLLEGE

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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 and Legal Studies, and Latin American and Latino Studies. Merrill also hosts a Peace Corps satellite officer who helps UCSC students interested in working overseas to apply to the Peace Corps after graduation; and KZSC, the campus radio station. It also hosts the Chicano/Latino Research Center; 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 modern

## The Colleges

computer facility with more than 40 state-of-the-art personal computers.

### COLLEGE THEME AND CORE COURSE

Cultural Identities and Global Consciousness is the ethos of Merrill College and is reflected in the theme of the college core course. Readings include diverse first-person narratives or works of fiction that focus on historical or political flashpoints, particularly those illuminating relationships between the developed and the developing world. Recent readings have included texts examining Chicano/Latino, Asian, African, Indian, and Islamic experiences. These works bear witness not only to conflicts and crises, but also to individual strengths and communal hopes. Students also read secondary sources related to the texts. Linked lectures, events, and films illuminate the case studies. The works studied expand international awareness by showing individuals and groups dealing with critical issues of nationalism, globalization, war, economic underdevelopment, and social and gender differentials. They frequently identify forms of social activism that respond to and seek to overcome violence and other problems. Students formulate their own analyses in relation to these examples and share their ideas in writing and seminar discussions. The course emphasizes skills central to intellectual life at the university. Critical reading, analytical writing, and formulation of ideas for presentation and debate in seminars with peers and teachers are emphasized as students expand their global horizons.

Those admitted as transfer students are exempt from the core course requirement but may take it at their discretion.

### OTHER COURSES AND ACADEMIC INITIATIVES

Merrill sponsors a variety of two- and five-credit courses on topics that change from year to year. Recently these have included a series of small classes drawing on ideas introduced in the Merrill Core, such as a course on human rights and another on foreign policy, and experiential learning classes on sustainable building practices and field study. Merrill also offers an upper division class in personal empowerment, and another on the research university for recent transfer students. Additionally, students can enroll in CLASSROOM CONNECTION, a service-learning course in which students volunteer in local and regional K–12 schools while also engaging in classroom discussions of readings on current issues in educational theory. Participants make final presentations.

Recognizing the increasingly rigorous requirements for science majors, Merrill—in collaboration with the

Academic Excellence Program—coordinates the Science Learning Community to support students majoring in the sciences. Students participating in the program enroll in small discussion sections that encourage a collaborative learning approach.

The Merrill Research Mentorship Program aims to prepare undergraduate students to pursue graduate studies and provides research experience and personal and professional development for Merrill students. An interested Merrill faculty member nominates a Merrill student whose interests dovetail with his or her own areas of research and expertise. Students who participate in the program (juniors and seniors) are employed as research assistants by their faculty mentors and receive up to \$800 for the school year.

The Merrill Peer Mentoring Program (MP<sup>2</sup>) matches newer Merrill students with more established students to help them acclimate to a new setting and the new demands of university life. MP<sup>2</sup> also provides a modest employment opportunity to peer mentors.

The Merrill College Distinguished Visiting Scholars Program hosts public and class presentations by national and international academics, artists, writers, and activists representing a wide variety of perspectives.

### COLLEGE COMMUNITY AND FACILITIES

Located on a hilltop, Merrill's newly renovated, award-winning buildings thread upward through the edge of a redwood forest. Glass curtain walls provide views from the A & B Buildings of the reconstructed college center and new restaurant building. The brick patios, gardens, outdoor café, and mission bell tower suggest California's Latino heritage. Merrill offers residence hall and apartment-style options for students. Four residence halls house approximately 550 students in two high-rise structures and two smaller buildings.

The apartments, which are located a short distance from the central area of the college, house 180 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.

With the help of the Merrill's Student Life Staff, staff and students work together to plan a diverse array of educational, social, recreational, and cultural events that include film series, art exhibits, intramural sports

## The Colleges

competitions, dances, musical events, and a yearly outdoor Moat mural painting party. Many of these social and educational activities focus on building a multicultural community. Other facilities at Merrill include the Cultural Center, where large events (including Merrill the Musical and the Glitterball) take place; the Baobab Lounge, which provides study space, a piano, and a television; and Merrill Academic Success (MAS), which provides Merrill students with a quiet place to study as well as close evening access to computers and a printer. Finally, Merrill is the only college that has a student-run pottery co-op. Students can throw, fire, and glaze their pieces in the workshop space; membership is open to Merrill students on a first-come, first-served basis. Merrill's two-year

renewal project to renovate the residence halls, update community space, and improve pathways and way-finding at the college will conclude in spring 2015.

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 web site](#) or call (831) 459-2144.

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### MERRILL COLLEGE FELLOWS AND STAFF

Merrill College faculty fellows are listed [here](#).

Merrill College staff are listed [here](#).

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## PORTER COLLEGE

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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.

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### 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.

Porter 80A and 80B, known as "Porter Core," provide rigorous training in critical reading and writing and study skills. Students meet with instructors in seminars and in small writing groups. Those who are admitted as transfer students are exempt from the core course requirement but may opt to enroll in Porter Core if resources permit it. Lower-division transfer students who have not completed at least one UC-transferable college English composition course with a minimum

grade of C (2.0) or better, prior to enrollment, are permitted to take the core course to satisfy the C1 requirement.

In addition to the core course, 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.

The college provides fellowship funds each year to talented students pursuing original research and creative projects.

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### 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, with from 30 to 35 students sharing common lounges and other facilities. Theme halls include Film and Digital Media, Science, Technology, Engineering and Math (STEM), Social Justice, and LGBTIQ. Students also have a choice of quiet, same gender, or substance-free halls. The six-person apartments are reserved for upper-division students.

Porter College is also home to the Transfer Community at Porter, a transfer student living/learning community. All 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

## The Colleges

study center, and a dining hall that converts to a theater space. The Arts Instructional Computing Laboratories, located at Porter College, consist of two high-end labs oriented toward the arts.

Porter provides constructive opportunities for relaxation and recreation to balance the intellectual demands of a university education. The Porter Activities Office organizes formal and informal events, including open-mic nights, dances, recreational 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 Quad, and the faculty gallery host a

wide range of artistic, cultural, and academic events each year.

Porter College facilities were constructed through a partnership of public funds and a gift from the Porter-Sesnon family of Santa Cruz. Part of the gift was used to establish an endowment for the college. For more information, call (831) 459-2273 or visit the [Porter College web site](#).

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### PORTER COLLEGE FELLOWS AND STAFF

Porter College faculty fellows are listed [here](#).

Porter College staff are listed [here](#).

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## KRESGE COLLEGE

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Kresge has a strong academic community that emphasizes creativity, leadership, sustainability, and community. Our motto is **Independence, Creativity, Community**.

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### ACADEMIC EMPHASES

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Kresge's core course 80, Power and Representation, is a writing class that explores the relationships between individuals and their communities. Our goal is to empower individuals to think beyond easy answers, to express themselves clearly, to feel at home in writing, and to feel powerful in representing themselves on the page. In Power and Representation, we examine the many ways we constitute ourselves (and are constituted) as individuals in relation to communities. First, we study ideas about representation as a theoretical grounding, and then focus on representations of nationality, ethnicity, sexual orientation, gender, and race in critical theory, film, fiction, theater, and nonfiction. Our purpose is to create a dialogue about ourselves and our relationship to our communities as it is, as it might be, and as we might help make it.

In addition to section meetings, on Tuesday nights all students come together to watch core-related films or performers or listen to lectures. All students complete a final creative project that engages with the theme of the course.

Lower-division transfer students who, prior to enrolling, have not completed at least one UC-transferable college English composition course with a minimum grade of C (2.0) or better are permitted to take the core course to satisfy the C1 (composition) requirement. Students who, in the Analytical Writing Placement Exam (AWPE), received a score of five or lower take a two-quarter version of the core class,

designed to increase competency in college-level writing

In addition to the core course, Kresge offers a series of courses that offer students the opportunity to study in small groups. Kresge has offered courses in journalism, comic writing, documentary film, gardening, and service learning.

Kresge is home to the Writing Center, including the Creative Writing archives, and also offers the following opportunities:

- The new Common Ground Center promotes social and environmental change through undergraduate-focused action-education, research, advocacy, and civic engagement.
- Transformative Action and Service Learning classes prepare students to become innovators in real-life community projects.
- The Kresge Garden is the site of our organic gardening and food systems classes, where students empower themselves by learning how to grow their own food and work together cooperatively.

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### RESIDENTIAL LIFE

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Kresge was the sixth college to be built on the UCSC campus. The college was founded on the principle of participatory democracy as a means of encouraging a strong sense of community. Architecturally renowned, Kresge 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 five to nine people. Kitchen and living areas look out onto the street, with other rooms facing the surrounding redwood forest. J and K Building's three-person apartments are reserved for continuing upper-division students. These two-

## The Colleges

bedroom apartments have an efficiency-style kitchen and living area.

Kresge is home to the Writer's 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 staff 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, on multicultural community building, and on enhancing academic success through music events, mural painting, and food-centered events are highlighted.

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### 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 providing voice 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 campuswide issues with college staff and faculty. Additionally, students can get involved in the Kresge Multicultural Education Committee (KMEC), Music Co-op, Food Co-op, Photo Co-op, or the Kresge Garden.

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### 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.

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### 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 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. Adjacent to the nearby meadow is an outdoor basketball court. 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. At the top of the college are the Town Hall, the Music Co-op, and the Owl's Nest Cafe.

For more information, call (831) 459-2071 or visit the [Kresge College web site](#).

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### KRESGE COLLEGE FELLOWS AND FACULTY

Kresge College faculty fellows are listed [here](#).

Kresge College staff are listed [here](#).

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## OAKES COLLEGE

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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

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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.

The Oakes core course, *Communicating Diversity for a Just Society*, is required of all first-year students. The course is writing intensive and examines individual and collective responses to issues of culture, gender, sexuality, race, and class. Those who are admitted as transfer students are exempt from the core course requirement but may take the core course at their option pending available space; lower-division transfer students who, prior to enrolling, have not completed at least one UC-transferable college English composition course with a minimum grade of C (2.0) or better are permitted to take the core course to satisfy the C1 requirement.

At Oakes College, we are committed to fostering 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 active citizens 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 will 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 and advising programs. Special assistance in writing and tutoring in a variety of subjects is offered to Oakes students and EOP students.

- The Oakes Computer Lab provides access to 20 PCs for Oakes students.
- Co-curricular programs like Oakes 4.0, 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.
- Community-based Advocacy and Research for Action (CARA), the Oakes Service Learning and Community Justice Program, brings together rigorous academic work with significant and meaningful service learning. CARA engages students in collaborative problem-solving on some of the most pressing problems of our time, focusing on issues of language, literacy, and education as fields of power, and therefore potentially organization and social transformation. The core of the program is the 150 series. Oakes 151A and 151B (Community Literacies seminar and Field Study in Curriculum Design, Observation, and Team Teaching) are offered each quarter, by application only; Oakes 152 (Transformative Literacies) is offered in winter, and Oakes 153 (Community Mapping) in spring.
- Student services at Oakes include academic advising and psychological counseling.

### COLLEGE COMMUNITY AND FACILITIES

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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 a lounge, 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. All students participate in a University Meal Plan. 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

## The Colleges

in integrating their academic and social needs. 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 library; a quiet space for individual study, a dining facility shared with College

Eight; and TV lounges in the residences. Adjacent to the Oakes Café is the Guzman Room, a social and group study space. 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 web site](#).

Oakes College Fellows and Staff

Oakes College faculty fellows are listed [here](#).

Oakes College staff are listed [here](#).

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## COLLEGE EIGHT

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College Eight 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. College Eight 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.

College Eight 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

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College Eight sponsors a number of educational initiatives aimed at furthering its theme and mission. A three-quarter core course, Nurturing Environmental Citizenship, is taught by senior faculty from the departments of Politics, Ecology and Evolutionary Biology, Earth and Planetary Sciences, and Electrical Engineering. The fall-quarter course is mandatory for all incoming freshmen, with the goal of introducing students to environmental issues—past, present, and future—as they manifest in California. The winter-quarter course addresses the principles of

environmental science, while the spring quarter course examines how technological innovation and engineering can address environmental challenges. In addition, practicum internships, a three-quarter course on the tools of sustainability work, and the sustainability studies minor all enable students to acquire skills that they can apply to the coming green economy and to take on service-learning work with campus and community-based agencies and organizations. Additional college courses include garden internships, filmmaking for Santa Cruz TV (SCTV) and the student journal Gaia, student-led classes in sustainability, a class on peregrine falcons, and a seminar on environment in film.

### COLLEGE COMMUNITY AND FACILITIES

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College Eight 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.

## The Colleges

College Eight'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 designated study lounges, 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, and the occupants are invited to small focused dinners with faculty and staff. Another 300 students are housed in College Eight'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 celebrating 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 office of College Eight'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 College Eight Café offers a quiet, comfortable space and 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 College Eight Student Programs Office plans social, multicultural, and educational events for the college community. Weekly Café Nights—featuring 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, College Eight 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, e-mail [8housing@ucsc.edu](mailto:8housing@ucsc.edu) or [bshelley@ucsc.edu](mailto:bshelley@ucsc.edu), or visit the [College Eight web site](#).

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### COLLEGE EIGHT FELLOWS AND STAFF

College Eight faculty fellows are listed [here](#).

College Eight staff are listed [here](#).

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## COLLEGE NINE

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**“From climate change to inequality, the commonality of problems facing all of the planet’s inhabitants requires an understanding of our growing interconnections and interdependencies. In College Nine, 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.”**

—Flora Lu, College Nine Provost

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### ACADEMIC EMPHASES

College Nine's theme of International and Global Perspectives emphasizes the causes and consequences of our increasingly interconnected world. Our academic and co-curricular programs analyze economic and cultural globalization, immigration, 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.

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### WRITING SEMINAR

In the first-quarter frosh course, Introduction to University Discourse: International and Global Issues, students examine current issues pertinent to the college's intellectual theme. Topics address issues such as globalization, inequities in wealth and poverty across the world, human rights, and regional conflicts.

## The Colleges

The seminar emphasizes the development of students' reading comprehension and oral and written communication skills. Students write several reflective and analytical papers during the quarter. Each paper undergoes at least one revision after the student receives constructive feedback from the instructor and peers. Thus, the instructors work closely with each student throughout the quarter.

All students who enter as frosh are required to pass the college writing seminar with a grade of C or better. Those who are admitted as transfer students are exempt from the core course requirement but may take the core course at their option pending available space; lower-division transfer students who, prior to enrolling, have not completed at least one UC-transferable college English composition course with a minimum grade of C (2.0) or better are permitted to take the core course to satisfy the C1 requirement.

### **SPECIAL ACADEMIC AND CO-CURRICULAR PROGRAMS**

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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 in particular contexts.

#### **Global Action**

In this workshop facilitated by peer instructors, 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.

#### **Service Learning: Esprit de Corps (110 and 110B), Praxis, and Alternative Spring Break**

Students extend their learning beyond the classroom by gaining practical experience volunteering for a school or a nonprofit organization in the Santa Cruz community. Examples include assisting in a classroom or at a homeless shelter. College Nine has its own service-learning class, Esprit de Corps (110 and 110B), taught by our service-learning coordinator. Students meet weekly to reflect on their experiences, discuss readings, and listen to speakers from the community. To complete the service experience, students develop a final paper or project related to civic engagement. The class is available all three quarters and is facilitated by students during the winter and spring. Praxis, College Nine's community-service organization, provides

another way to serve the Santa Cruz community. Praxis students meet weekly and volunteer on the weekends at a variety of locations. Over the spring break students can participate in an Alternative Spring Break Project and earn credit at the same time. Students join forces with local community activists by immersing themselves in the issues and solutions of this multifaceted region of Santa Cruz County.

#### **Students as Teachers and Mentors**

College Nine students have special opportunities to become course assistants, tutors, and student mentors for course credit. Students gain independent experience as teachers leading their own discussion sections of a College Nine course. They receive close supervision that emphasizes a collaborative approach to developing and enhancing teaching, communication, and leadership skills. The College Nine academic advisers can also direct students to other opportunities for student teaching and peer-mentoring programs on campus. These are excellent opportunities to work closely with a faculty member and to develop one's own skills as a teacher and a leader.

#### **Practical Activism: Tools for Local and Global Change**

The annual Practical Activism Conference is a daylong, student-led event featuring keynote speakers, ten 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 [activism.ucsc.edu](http://activism.ucsc.edu) for more information.

#### **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.

#### **Research Opportunities**

The faculty at UC Santa Cruz are highly ranked for the quality of their research. College Nine students are encouraged to take advantage of the many excellent opportunities available to work closely with faculty as research apprentices. Students will find many internship, independent study, or senior thesis programs in the departments of most majors. The College Nine academic advisers will help link students with these programs.

### **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 that are especially apt to help them succeed in college and beyond. Two pathways are possible:

- Research and scholarship. In this pathway, students pursue research with faculty by completing three quarters (15 credits) of work on a senior thesis or a research internship. Students may be recognized with College Nine Distinction if they do a thesis or a research internship in their major on a topic related to international or global issues.
- Language and culture. Students who enroll in at least three quarters (15 credits) in either Education Abroad or a foreign language (or a combination) may qualify for College Nine Distinction.

### **COLLEGE COMMUNITY**

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Founded in Fall 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. Students 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, debates, films, arts events, and interactive workshops. These programs unite community members in an atmosphere of mutual respect, in which they discuss important contemporary issues.

#### **College Nights**

College Nights are community programs that feature a special dinner menu, entertainment, 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 quarter 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 the global influence of American popular culture. College Nights are held in the Dining Commons and are open to all College Nine students, staff, and faculty.

#### **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

students to campus and college committees, consults with college administration on policy development, and provides monetary support to student organizations.

#### **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. Half of the residents are students from the United States, and the other half are students from various countries around the world. Students reside in the Colleges Nine and Ten Apartments. 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 residence hall floor made up of a mix 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. This unique community offers residents opportunities to make meaningful, lifelong friendships and connections that extend beyond borders.

#### **Think Global; Act Local**

Think Global; Act Local is College Nine's living-learning community for students who wish to practice the components of service learning. Students living on this floor will have the opportunity to gain knowledge and understanding of important social justice issues occurring in Santa Cruz and in the world at large. Students participate in local service projects several times per quarter and take the time to reflect individually and as a group upon their actions.

#### **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 skills. There are many opportunities at College Nine for student involvement. These include the following groups as well as many other programs, activities, and clubs.

#### **Global Leadership Development (GLAD)**

GLAD meets weekly throughout the fall quarter and provides a wide range of exercises, guest speakers, and programs designed to foster and develop participants' efficacy as world citizens and leaders of College Nine.

#### **CREATE**

## The Colleges

CREATE (Cultural Resources to Educate and to Empower) offers a community at College Nine for students of color to find support and empowerment through mentorship and friendship.

### **Praxis (Student Volunteer Community)**

Praxis is an organization geared toward community building and social justice. By participating in Praxis, students gain exposure to a variety of Santa Cruz community agencies and explore what it means to be agents of social change.

### **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**

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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 575 single, double, and triple bedrooms. These fully furnished residence halls include student lounges, recreational spaces, and Internet connections. 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 357 upper-division students in apartments, with 170 students in single bedrooms and the balance in double and triple rooms. All apartments have full kitchens, living rooms, bathrooms, and Internet connections. 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, e-mail [jhartman@ucsc.edu](mailto:jhartman@ucsc.edu) or visit the [College Nine web site](#).

### **COLLEGE NINE FELLOWS AND STAFF**

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College Nine faculty fellows are listed [here](#).

College Nine staff are listed [here](#).

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## COLLEGE TEN

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**“At College Ten, we strive toward the goals of analyzing, embodying, and implementing ideas that move individuals and society toward a practice of the principle that all people possess equal intrinsic worth.”**

—Flora Lu, College Ten Provost

### **ACADEMIC EMPHASES**

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College Ten's theme of Social Justice and Community addresses a range of social problems and their impact on society. In particular, the academic and co-curricular programs consider the injustices that many people confront in their lives and possible policies for addressing 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 or scholarly research.

The college 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 beliefs, or political views. They also consider the causes and consequences of economic inequality both within the United States and around the world.

### **WRITING SEMINAR**

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In the first-quarter frosh course, Introduction to University Discourse: Social Justice and Community, students examine current issues pertinent to the college's intellectual theme. Students explore issues such as poverty, discrimination, and economic injustice and the role of communities, governments, and corporations in addressing such societal inequities.

The seminar emphasizes the development of students' reading comprehension and oral and written communication skills. Students write several reflective and analytical papers during the quarter. Each paper undergoes at least one revision after the student receives constructive feedback from the instructor and peers. Thus, the instructors work closely with each student throughout the quarter.

## The Colleges

All students who enter as frosh are required to pass the college writing seminar with a grade of C or better. Those who are admitted as transfer students are exempt from the core course requirement but may choose to take the core course pending available space; lower-division transfer students who, prior to enrolling, have not completed at least one UC-transferable college English composition course with a minimum grade of C (2.0) or better are permitted to take the core course to satisfy the C1 requirement.

### SPECIAL ACADEMIC AND CO-CURRICULAR PROGRAMS

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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 in particular contexts.

#### **Social Justice Issues Workshop**

College Ten students have the option of enrolling in the Social Justice Issues Workshop in winter quarter. This two-credit course 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.

#### **Service Learning: Esprit de Corps (110 and 110B), Praxis, and Alternative Spring Break**

Students can extend their learning beyond the classroom by gaining practical experience volunteering for a school or nonprofit in the Santa Cruz community for credit. Examples include assisting in a classroom or at a homeless shelter. College Ten has its own service-learning class, Esprit de Corps (110 and 110B), taught by our service-learning coordinator. Students meet weekly to reflect on their experiences, discuss readings, and listen to speakers from the community. To complete the service experience, students develop a final project related to civic engagement. The class is available all three quarters and is facilitated by students during the winter and spring. Praxis, College Ten's community-service organization, provides another way to serve the Santa Cruz community. Praxis students meet weekly and volunteer on the weekends at a variety of locations. Over the spring break students can participate in an Alternative Spring Break Project and

earn credit at the same time. Students join forces with local community activists by immersing themselves in the issues and solutions of this multifaceted region of Santa Cruz County.

#### **Practical Activism: Tools for Local and Global Change**

The annual Practical Activism Conference is a daylong, student-led event featuring keynote speakers, 10 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.org](http://practicalactivism.org) for more information.

#### **Students as Teachers and Mentors**

College Ten students have special opportunities to become course assistants, tutors, and student mentors for course credit. Students gain independent experience as teachers leading their own discussion sections of a College Ten course. They receive close supervision that emphasizes a collaborative approach to developing and enhancing teaching, communication, and leadership skills. The College Ten academic advisers can also direct students to other opportunities for student teaching and peer-mentoring programs on campus. These are excellent opportunities to work closely with a faculty member and to develop one's own skills as a teacher and a leader.

#### **Research Opportunities**

The faculty at UC Santa Cruz are highly ranked for the quality of their research. College Ten students are encouraged to take advantage of the many excellent opportunities available to work closely with faculty as research apprentices. Students will find many internship, independent study, or senior thesis programs in the departments of most majors. The College Ten academic advising teams (including preceptor and provost) will help link students with these programs.

#### **College Ten Pathways to Distinction**

Students are recognized with College Ten Distinction upon successful completion of three quarters (15 credits) of experiential coursework in Service and Leadership and/or Research and Scholarship focused on social justice and diversity issues. Applicable courses in service-learning 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 are apt to help them succeed in college and beyond.

## COLLEGE COMMUNITY

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Founded in Fall 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. Students 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, and interactive workshops. These programs unite community members in an atmosphere of mutual respect, in which they discuss important contemporary issues.

### **College Nights**

College Nights are community programs that feature a special dinner menu, entertainment, 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 quarter 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 the global influence of American popular culture. College Nights are held in the Dining Commons and open to all College Ten students, staff, and faculty.

### **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 campus wide governance board. The Senate appoints students to campus and college committees, consults with college administration on policy development, and provides monetary support to student organizations.

### **Rumi's Field**

Named after a renowned peace-seeking Sufi poet, Rumi's Field offers a space for students who wish to learn, live and interact, using the skills of Nonviolent Communication and exploring social justice through the lens of nonviolence. Nonviolent Communication (NVC) strengthens one's ability to inspire empathy from others and respond compassionately even under difficult circumstances. This mixed community of College Ten first-year and continuing students will offer 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 skills. There are many opportunities at College Ten for student involvement. These include the following groups as well as many other programs, activities, and clubs.

### **CREATE**

The purpose of CREATE (Cultural Resources to Educate and to Empower) is to facilitate the ongoing discussion of diversity issues at College Ten and in our living communities, learn about and promote multiculturalism, plan activities, and help students and staff have a resource for inclusiveness and training.

### **ENGAGE**

ENGAGE (Explore New Growth and Gain Experience) offers students the opportunity to explore and develop their own beliefs, values, and feelings about current issues and social concerns. Students gain leadership skills through collaborating on a community action project, and develop relationships and experience to become leaders in the College Ten community. ENGAGE meets weekly throughout fall quarter.

### **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 (both structured and informal). 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. The Multicultural Community Weekend is optional; students apply for this opportunity in the fall.

## The Colleges

### **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 nightly for social justice 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.

### **PHYSICAL SURROUNDINGS**

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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, double, and triple bedrooms. These fully furnished residence halls include student lounges, recreational spaces, and Internet connections. In addition, there is a state-of-the-art dining hall with an adjoining game room and Freitas Café, a coffee lounge for both Colleges Nine and Ten. Colleges Ten and Nine also house approximately 350 upper-division students in apartments, with 170 students in single bedrooms and the balance in double and triple rooms. All apartments have full kitchens, living rooms, bathrooms, and Internet connections. 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, e-mail [jhartman@ucsc.edu](mailto:jhartman@ucsc.edu) or visit the [College Ten web site](#).

### **COLLEGE TEN FELLOWS AND STAFF**

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College Ten faculty fellows are listed [here](#).

College Ten staff are listed [here](#).

Revised 09/01/15

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## PROGRAMS AND COURSES

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The academic programs offered at UC Santa Cruz are described in detail in this section. Curricula, courses, and degrees listed in this catalog are subject to change through normal academic channels. New proposals and changes are initiated by the relevant departments, divisions, or colleges and approved by the appropriate academic dean and by the Committee on Educational Policy or the Graduate Council. The designations F (fall), W (winter), S (spring), or Summer that appear at the end of each course indicate the intentions of the academic units; however, on occasion, the actual scheduling of classes may change.

For changes and additions to courses listed in this catalog, consult the [Schedule of Classes](#) and [the Class Search](#) published each quarter and available on the web. The Office of the Registrar also provides detailed information on its [web site](#).

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### COURSE CREDIT

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Unless otherwise specified in the course description, each course earns 5 quarter credits. Therefore, regardless of course format or scheduling, each course makes approximately equal demands on enrolled students.

All physical education courses are noncredit. Other noncredit courses include certain graduate seminars. Laboratory courses, music courses involving individual lessons or ensemble participation, as well as some special-interest seminars and individual studies courses carry less than 5 credits and are designated accordingly.

The normal UCSC undergraduate program of study is three 5-credit courses per quarter or equivalent. In 12 quarters at UCSC, most students complete 180 credits. With a college's approval, a student may be allowed to vary the course load. See also [Part-Time Program](#).

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### COURSE NUMBERING

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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 are open to first-year and sophomore students who have sufficient background and the consent of the instructor in charge. Graduate courses (numbered 200–299) are either restricted to graduate students or open only to students

who can show the instructor that they have completed sufficient upper-division coursework basic to the subject matter of the course.

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### FOOTNOTES

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Courses marked with an asterisk (\*) will not be offered in the 2015-16 academic year. Courses marked with a dagger (†) will be offered, with the quarter as yet to be determined.

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### GENERAL EDUCATION CODES

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The general education codes that appear in some course descriptions are explained in the section on [general education requirements](#).

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### COURSE FORMAT

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Most courses at UCSC are taught as lectures or, when the class is small enough for considerable discussion, as seminars. A large number of courses require enrollment in a secondary discussion section scheduled at a different time from the primary course. Sometimes there is laboratory or fieldwork associated with a course.

Occasionally, a student may wish to do an individual project as part of the work for a course. UCSC instructors are usually quite willing to consider and evaluate such work, time permitting.

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### PREREQUISITE POLICY

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When applicable, prerequisites are listed in this catalog within the course description for each course. There are many courses that meet general education requirements and do not require a prerequisite.

Prerequisites come in many forms—for example, specific courses, placement examinations, or “satisfaction of the Entry Level Writing and Composition requirement” for writing courses. Some course descriptions also specify that students must be declared majors or seniors in order to enroll. Other course descriptions recommend the appropriate background for a course—for example, “ability to use algebra and solve problems.”

Questions concerning prerequisites should be directed to the instructor of the course or the respective department office. Students who have not met all prerequisites may be excluded from a course. Alternatively, the instructor or a department adviser

## Programs and Courses

may waive the prerequisite based on demonstrated competence or equivalent academic experience.

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### CLASS SIZE

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A student's class level plays a large part in how many small classes are available. Introductory classes tend to be large, although they are usually accompanied by required small sections or laboratories. Many small classes have prerequisite courses that enroll large numbers of students. Also, certain large classes fulfill campuswide general education requirements. First-year students experience at least one small seminar in conjunction with the college core course, and they are likely to experience an increasing proportion of small classes as they progress to senior status.

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### INDIVIDUAL STUDY

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Especially in the upper division, students are encouraged to devise special courses to pursue independently, under the guidance of faculty members. A study plan should be discussed with a faculty member in the general subject area of interest. This faculty member will ultimately be responsible for evaluating the work done. The study plan must also be approved by the course sponsoring agency; it should be noted that not all proposed plans are accepted.

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### FIELD STUDY

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Independent, off-campus field study is available through many departments. It is handled in much the same way as individual study. In addition, there are several established field programs that offer a variety of full- or part-time, off-campus, field placements as part of the regular program of academic study. For more information on these programs, see [Field and Exchange Programs](#) in the Undergraduate Academics section.

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### APPRENTICE TEACHING

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An upper-division or graduate student may apply for approval to teach an undergraduate seminar of his or her own design. The seminar is supervised by a faculty member and carries normal academic credit for the students and the apprentice teacher. Interested students should initiate a proposal with a faculty member in the appropriate subject area.

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### CREDIT BY PETITION

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Regularly enrolled students may obtain full academic credit for a course by challenging the course. Challenging the course entails passing an examination or completing an appropriate body of work supervised by a regular instructor for the course. The petition for such credit must be approved by the instructor of the course, the chair of the department offering the course (or provost, if it is a course offered by a college), and the provost of the student's college. Some courses are not considered appropriate for credit by petition.

For foreign language students, credit by petition may not be used by students whose language ability greatly exceeds the course level proposed for challenge. Petitions for credit for levels 4 and 5 cannot be filed in the same quarter. Contact the Language Program, 239 Cowell, 459-2054, for more information.

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### AUDITING OF CLASSES

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Instructors may permit nonenrolled students to attend their classes when space is available after all students who wish to enroll officially have done so. An instructor is not obligated to devote time to the work of students who are not officially enrolled in the class.

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# ACADEMIC ENGLISH

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2015-16 General Catalog

Department of Languages and Applied Linguistics

218 Cowell College

(831) 459-2054

<http://language.ucsc.edu>

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## PROGRAM DESCRIPTION

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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. The 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.

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## ACADEMIC ENGLISH COURSES

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### UPPER-DIVISION COURSES

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#### **110A. Advanced Academic English 1.**

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 restricted to international students. The Staff

#### **110B. Advanced Academic English 2.**

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 by instructor consent only. Enrollment restricted to international students. The Staff

#### **110C. Advanced Academic English 3.**

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. The Staff

#### **110D. Advanced Academic English 4.**

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 by instructor consent only. Enrollment restricted to international students. The Staff

Revised: 09/01/15

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# ANTHROPOLOGY

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2015-16 General Catalog  
361 Social Sciences 1 Building  
(831) 459- 3320  
<http://anthro.ucsc.edu/>

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## PROGRAM DESCRIPTION

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Anthropology studies people throughout the world and through time. Because it covers a wide range of topics— physical 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 UCSC offers courses that reflect the diversity of the field.

Cultural anthropology explores the movements of people, objects, and ideas in diverse societies, including our own. Cultural anthropology courses examine such topics as race and ethnicity, medicine, science, gender, sexuality, the environment, religion, law, popular culture, and politics.

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 East Africa and the American Southwest.

Physical/biological anthropology traces the human journey from its beginnings in Africa over five million years ago. Physical 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.

UCSC students have the opportunity to do independent library and field research in cultural anthropology, archaeology, and physical anthropology. Laboratory courses in archaeology and physical 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, and the interpretation of archives.

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.

Most anthropology faculty have their offices in Social Sciences 1 Building. Social Sciences 1 also houses the Visual Culture Research Laboratory and laboratories for archaeology and physical anthropology where space is provided for laboratory and individual studies courses and for collections of mammalian skeletal material, casts of fossil hominids, ceramics, stone tools, and other archaeological artifacts.

The Anthropology Society, a campus club, is open to all students interested in anthropology. The Anthropology Colloquium 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/Physical Anthropology Lunch forum to share information on fieldwork and employment opportunities.

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## PROGRAM LEARNING OUTCOMES

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A student who graduates with a B.A. in Anthropology has the following knowledge and skills:

### CORE CONCEPTS IN ANTHROPOLOGY

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The student demonstrates understanding of the core concepts in three primary subfields of anthropology: cultural anthropology, archaeology, and physical anthropology.

### KNOWLEDGE OF CULTURAL DIFFERENCES

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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

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The student integrates cultural, biological, and archaeological perspectives on human bodies, behavior, and institutions.

## Anthropology

### WRITTEN COMMUNICATION

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The student demonstrates the ability to write clearly and to formulate well-organized arguments that are grounded in supporting evidence while countering evidence that contradicts the student's claims.

### ORAL COMMUNICATION

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The student is able to organize ideas and information and articulate them effectively.

### RESEARCH AND ANALYTICAL SKILLS

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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

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The student has a grasp of long-term changes in the conditions that have shaped humans and the environments they inhabit.

## UNDERGRADUATE HANDBOOK

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All undergraduate majors should obtain a copy of the Anthropology Department undergraduate handbook from the department web site. It outlines information on department procedures and requirements, program planning, independent study, faculty interests, and campus resources for anthropology majors.

## ADMISSION INTO THE MAJOR

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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, 2, or 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.

## REQUIREMENTS OF THE MAJOR

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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. Peer advisers are also available.

The anthropology major incorporates the three anthropological subfields of archaeological archaeology, cultural anthropology, and

physical/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.

To graduate with an anthropology major, students must successfully complete the following courses:

### THREE LOWER-DIVISION COURSES

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ANTH 1: Introduction to Biological Anthropology

ANTH 2: Introduction to Cultural Anthropology

ANTH 3: Introduction to Archaeology

### TEN UPPER-DIVISION COURSES

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one course in physical/biological anthropology **or** archaeology

one course in ethnographic area studies

one course in sociocultural anthropology

one course in anthropological theory

five anthropology electives (any additional upper-division anthropology courses)

One senior comprehensive requirement, which can be satisfied in **one** of three ways:

Senior Seminar (usually courses numbered ANTH 194)

Graduate Seminar (200-level course), enrollment by petition only

Senior Thesis, plus one additional elective; enrollment by petition only

Students must also complete the Disciplinary Communication (DC) Requirement.

### Anthropological Theory Courses

100 History and Theory of Physical Anthropology

150 Communicating Anthropology

152 Survey of Cultural Anthropological Theory

170/270 History of Archaeological Theory

### Sociocultural Anthropology Courses

**Note: Not all of these courses are offered each year**

119 Indigenous Visual Culture

120 Culture in Film

121 Socialism

122 Postsocialism

## Anthropology

- 123 Psychological Anthropology
- 124 Anthropology of Religion
- 126 Sexuality and Society in Cross-Cultural Perspective
- 127 Ethnographies of Capitalism
- 128 Contemporary American Evangelical Culture
- 129 Other Globalizations: Cultures and Histories of Interconnection
- 131 Women in Cross-Cultural Perspective
- 132 Photography and Anthropology
- 133 Narratives of the Popular
- 134 Medical Anthropology
- 135A Cities
- 136 The Biology of Everyday Life
- 137 Consuming Culture
- 138 Political Anthropology
- 139 Language and Culture
- 140 Art, Artist, Artifact
- 141 Developing Countries
- 142 Anthropology of Law
- 143 Performance and Power
- 144 Anthropology of Poverty and Welfare
- 145X Special Topics in Socio-Cultural Anthropology
- 146 Anthropology and the Environment
- 148 Gender and Global Development
- 151 Workshop in Ethnography
- 153 Medicine/Colonialism
- 154 Multimedia Ethnography
- 157 Modernity and Its Others
- 158 Feminist Ethnographies
- 159 Race and Anthropology
- 160 Reproduction and Population Politics
- 161 The Anthropology of Food
- 162 Anthropology of Displaced Persons
- 163 Kinship
- 164 Anthropology of Dance
- 165 Anthropological Folklore
- 166 States, Bureaucracies, and Other Cosmological Propositions

### **Ethnographic Area Studies Courses**

**Note: Not all of these courses are offered each year**

- 130A Peoples and Cultures of Africa
- 130B Brazil
- 130C Politics and Culture in China

- 130E Culture and Politics of Island Southeast Asia
- 130F African Diasporas in the Americas
- 130G Asian Americans in Ethnography and Film
- 130H Ethnography of Russia and Eastern Europe
- 130I Cultures of India
- 130J Politics and Statemaking in Latin America
- 130L Ethnographies of Latin America
- 130M Inside Mexico
- 130N Native Peoples of North America
- 130T Anthropological Approaches to Islam
- 130U Central America
- 130V Ethnography of Russia
- 130W Ethnography of Eastern Europe
- 130X Special Topics in Ethnography

### **Physical/Biological Anthropology and Archaeology Courses**

**Note: Not all of these courses are offered each year**

- 101 Human Evolution
- 102A Human Skeletal Biology
- 103 Forensic Anthropology
- 103B Forensic Anthropology and Bioarchaeology
- 104 Human Variation and Adaptation
- 105 Human Paleopathology
- 106 Primate Behavior and Ecology
- 107 Methods and Research in Molecular Anthropology
- 111 Human Ecology
- 112 Life Cycles
- 171 Materials and Methods in Historical Archaeology
- 172 Archaeological Research Design
- 173 Origins of Farming
- 174 Origins of Complex Societies
- 175A African Archaeology
- 175B African Archaeology: Development
- 175C African Diaspora Archaeology
- 176A North American Archeology
- 176B Meso-American Archaeology
- 176C Archaeology and the American Southwest
- 176D Colonial Encounters in the Americas
- 176E Archaeology of the Pacific Northwest
- 177 European Conquest of the Americas
- 178 Historical Archaeology: A Global Perspective
- 180 Ceramic Analysis in Archaeology
- 182A Lithic Technology

## Anthropology

- 184 Zooarchaeology
- 185 Osteology of Mammals, Birds, and Fish
- 187 Cultural Heritage in Colonial Contexts
- 189 Archaeology Field Course
- 190X Special Topics in Archaeology/Physical Anthropology

### **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, ethnographic area studies, or physical/biological anthropology and archaeology courses.

- 110A Contemporary Issues
- 110B Archaeology as Pop Culture
- 110E Global Environmental Change
- 110F Biocultural Approaches to Food
- 110G Barrio Popular Culture
- 110H Acoustic Culture
- 110K Culture through Food
- 110L Anthropology of Life
- 110O Postcolonial Britain and France
- 110Q Race and the Performing Arts
- 110P India and Indian Diaspora Through Film
- 110R Discourses in American Religions and Their Role in Public Life
- 110T Motherhood in American Culture
- 110V Anthropology of Violence and Conflict
- 110W Land and Waterscapes Entropology
- 110X Toxic Environments

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### EXIT REQUIREMENT

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Students can fulfill the senior comprehensive requirement in anthropology either by passing an advanced senior seminar (194-series course, 190ABC, or 196AB), by writing an acceptable independent senior thesis, or by passing an approved graduate-level topical seminar in anthropology.

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 1, 2, and 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 intend to satisfy the exit requirement by taking a graduate seminar must first get permission from the department. Not all graduate seminars are appropriate for fulfilling this requirement. Students who take a graduate-level course to fulfill the theory requirement may not use this course to satisfy the exit requirement.

All majors, including double majors, must prepare a program of study in consultation with a member of the Anthropology Department. 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. Students going on to graduate school should plan course schedules in close consultation with faculty advisers.

Many anthropology majors whose studies emphasize archaeology have benefited from concurrent study in the Cabrillo College Archaeological Technology Certificate Program. This vocational certification program is sponsored entirely by Cabrillo College, but credit for its summer field survey and excavation component may be transferred for credit at UCSC. Although courses in the Archaeological Technology Certificate Program do not count toward the UCSC anthropology major, students who have obtained the certificate in tandem with their bachelor's degree in anthropology have expanded their employment and advanced degree program opportunities. Students interested in exploring this possibility are encouraged to consult with UCSC archaeology faculty and to visit the program's web site at <http://www.cabrillo.edu/academics/anthropology/>.

### **Senior Seminars**

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

- 194A Anthropology of Dead Persons
- 194B Chimpanzees: Biology, Behavior and Evolution
- 194C Feminist Anthropology
- 194D Tribes/Castes/Women
- 194E Belief
- 194F Memory
- 194G Politics and Secularism
- 194H Paleoanthropology
- 194I Consumption and Consumerism
- 194K Reading Ethnographies

## Anthropology

- 194L Archaeology of the African Diaspora
- 194M Medical Anthropology
- 194N Comparison of Cultures
- 194O Masculinities
- 194P Space, Place, and Culture
- 194Q Race, Ethnicity, Nation
- 194R Religion, Gender, Sexuality
- 194S The Anthropology of Sound
- 194T Poverty and Inequality
- 194U Environmental Anthropology: Nature, Culture, Politics
- 194V Picturing Cultures
- 194W The Anthropology of Social Movements
- 194X Women in Politics: A Third World Perspective
- 194Y Archeology of Space and Landscape
- 194Z Emerging Worlds
- 196C Traveling Cultures
- 196D Food and Medicine
- 196E Pastoralists Past and Present
- 196F The Anthropology of Things: Gift, Sign, Commodity, Tool
- 196G Advanced Topics in Folkloristics
- 196H Global History and the Longue Durée
- 196I Hard Problems
- 196J Imagining America
- 196K Settler Colonialism
- 196L Archaeology of the American Southwest
- 196M Modernity and Its Others
- 196T Archaeology of Technology

Two-credit courses do not count toward the 10 upper-division courses required for the major. Only one 5-credit individual studies course (197, 198, or 199) may be counted toward the 10 required upper-division courses. Course 107L does not count toward the 10 upper-division courses required for the major. Theory courses can only be counted toward the theory requirement or an upper-division elective.

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### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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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: a) complete an Anthropological Theory Course (chosen from ANTH 100, 150, 152, 170, 270)

and; b) complete a Senior Seminar or complete an Independent Senior Thesis, following the guidelines of the senior exit requirement. Students who take 270 to fulfill the theory/DC requirement may not use the course to satisfy the senior exit requirement. Please refer to the Undergraduate Handbook for details.

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### TRANSFER STUDENTS

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If possible, transfer students should complete lower-division requirements for the major before coming to UCSC by taking classes equivalent to courses 1, 2, and 3. Department policy also allows students to petition up to 10 quarter credits (equivalent to two UCSC courses) of upper-division transfer credit toward the major requirements. Any courses completed at the community college level are not considered to be upper-division courses. Transfer students should bring an unofficial copy of all pertinent transcripts to the undergraduate adviser in the department office (361 Social Sciences 1 Building) as soon as possible after reaching campus so that prerequisites can be verified and course enrollment can proceed smoothly.

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### PEER ADVISERS

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The Anthropology Department has instituted a peer adviser program as a supplement to academic advising offered by faculty members. The peer advisers are juniors and seniors who have been trained to help students with questions and general guidance through the anthropology major. Peer advisers hold regularly scheduled office hours in the department office.

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### HONORS

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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 cumulative (GPA) through the quarter before graduation. The criteria for awarding highest honors in the major are overall superlative performance in the major and general breadth of excellence across the subfields of anthropology. Receiving honors on the senior exit requirement is also considered as a factor in awarding highest honors, but is not always

## Anthropology

determinative. When applicable, narrative evaluations can be taken into consideration for highest honors.

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### MINOR REQUIREMENTS

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The UCSC 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.

#### Three Lower-Division Courses

ANTH 1: Introduction to Biological Anthropology

ANTH 2: Introduction to Cultural Anthropology

ANTH 3: Introduction to Archaeology

#### Seven Upper-Division Courses

one course in physical anthropology **or** archaeology

one course in ethnographic area studies

one course in sociocultural anthropology

four anthropology electives (any additional upper-division anthropology courses, no independent study courses)

Independent study courses cannot be used toward completion of the minor.

For more information regarding department policies, please consult the undergraduate adviser at the Anthropology Department office, 361 Social Sciences 1 Building. A handbook on the anthropology program is available on the anthropology web site <http://anthro.ucsc.edu/>.

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### ANTHROPOLOGY/EARTH SCIENCES COMBINED MAJOR REQUIREMENTS

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The Anthropology Department also collaborates with the Earth and Planetary Sciences Department to offer a combined major, which leads to a B.A. in anthropology/Earth sciences.

The anthropology/Earth sciences combined major is designed for students with strong interests in Earth sciences and in the laboratory-based subfields of anthropology. This includes anthropology students who are interested in archaeology or paleoanthropology and desire more intensive training in the natural sciences, and Earth sciences students who are interested in paleobiology or archaeology. The combined major allows students to receive a strong grounding in both disciplines without pursuing a double major or major/minor in the two departments. This program will permit anthropology/Earth sciences majors to enter graduate programs in Earth sciences, archaeology

or paleoanthropology with extraordinarily well-developed geological knowledge and skills.

Anthropology-based students in the combined major are encouraged to augment the science-rich required curriculum with upper-division courses in cultural anthropology.

#### Eleven Lower-Division Courses

Anthropology 1 – Introduction to Biological Anthropology

Anthropology 2 – Introduction to Cultural Anthropology

Anthropology 3 – Introduction to Archaeology

Earth Sciences 5/5L **or** Earth Sciences 10/10L **or** Earth Sciences 20/20L

Mathematics 11A **or** 19A

Mathematics 11B **or** 19B

**Five** lower-division cognate science courses from the following: Chemistry 1A, Chemistry 1B/M, Chemistry 1C/N, Physics 6A/L, Physics 6B/M, Biology 20A, Biology 20B, Biology 20C

#### Eight Upper-Division Courses

Earth Sciences 110A/L – Evolution of the Earth

Any **three** Earth Sciences upper-division electives (must be 5-credit courses)

Any **four** Anthropology upper-division electives from the physical anthropology or archaeology concentrations (must be 5-credit courses)

**One Senior Comprehensive Requirement** (choose one of the following)

Anthropology 194 – Any Senior Seminar in Physical Anthropology or Archaeology (by petition)

Earth Sciences 188A-B - Summer Field Internship

Senior Thesis (by petition only)

Any approved Earth science field program (by petition only)

Students must coordinate with both the Earth and Planetary Sciences Department **and** the Anthropology Department to complete the combined major.

Faculty Adviser in Anthropology: Judith Habicht-Mauche, [judith@ucsc.edu](mailto:judith@ucsc.edu)

Faculty Adviser in Earth Sciences: Paul Koch, [plkoch@ucsc.edu](mailto:plkoch@ucsc.edu)

Anthropology Undergraduate Adviser: Christina Domitrovic, [cdomitro@ucsc.edu](mailto:cdomitro@ucsc.edu)

Earth Sciences Undergraduate Advising: [epsadvising@ucsc.edu](mailto:epsadvising@ucsc.edu)

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## GRADUATE PROGRAM

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The anthropology doctoral program at UCSC consists of two tracks: cultural anthropology and anthropological archaeology. The majority of students are admitted to the cultural anthropology program. Smaller numbers of students are admitted to the anthropological archaeology program. Admission to the physical anthropology program described below has been suspended indefinitely.

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 many faculty in the cultural anthropology graduate program at UCSC. In recent years, anthropology's central concept of culture has been subjected to extraordinary ethnographic and theoretical pressures. Across the social sciences, scholars are responding to emergent scientific and social dilemmas by turning to the concept of culture and the ethnographic method. Such disciplinary turns grow from a challenging new set of social configurations, which affect both scholarly and lay understandings of the present, past, and future: the demise of certainties about progress and modernization and the need to understand newly emergent worlds. Nineteenth- and 20th-century ideas of progress and programs of modernization both created the concept of culture and relegated it to a nostalgic role as backward-looking sentiment. Anthropologists studied “vanishing worlds.” In the past 30 years, however, such certainties have been challenged. Grand theories of human behavior that depended on the idea of a universal man have begun to fray around the edges. Heterogeneity and disjuncture have caught the attention of a wide range of social scientists, calling out for ethnographic investigation. In this context, scholarly discussions have turned toward culture, the world-making networks, geographies, innovations, meanings, and assemblages that are carrying us into the future.

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 archaeology of late pre-colonial societies

in East and West Africa, Latin America, and western North America, especially the Southwest, California, and Pacific Northwest. The program also features an emerging concentration on the archaeology of colonial encounters among peoples of Europe, Africa, the Caribbean, and the Americas. 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.

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## ANTHROPOLOGY PH.D. REQUIREMENTS

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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 Preliminary Committee.

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### RESIDENCY REQUIREMENT

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The minimum residency requirement for a Ph.D. degree at UCSC is six quarters. To receive a degree from UCSC, students must be registered at the Santa Cruz campus for at least three of the six quarters. A minimum of one quarter in residence is required between Advancement to Candidacy and the awarding of the degree.

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### GOOD ACADEMIC STANDING AND PROBATION

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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:

Reason why (failed X class, etc.)

Steps that must be taken to restore satisfactory academic standing

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.

## Anthropology

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.

### CULTURAL TRACK REQUIREMENTS

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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

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Must be completed in Fall/Winter of first year in program.\*

200A Core Course

200B Core Course

\* ANTH 252, Survey of Cultural Anthropology, is recommended if student comes from a non-anthropological background.

#### Ethnographic Writing Requirement

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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 Graduate Seminars

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Grant Writing (ANTH 228), Colloquia (ANTH 292), Independent Study (ANTH 297/299), and tutorials do not count toward this requirement. Tutorials that are taught in conjunction with undergraduate courses do not count toward this requirement.

214 Culture and Power

219 Religion, State, Secularities

220 Cartography of Culture

224 Anthropology of Secularism

225 The Anthropology Of Things: Sign, Gift, Commodity, Tool

229 Constructing Regions

230 Bodies/Images/Screens

231 Intimacy and Affective Labor

232 Body/Knowledge/Practice

234 Feminist Anthropology

235 Language and Culture

236 On Insults

238 Advanced Topics in Cultural Anthropology

241 Social Justice

243 Cultures of Capitalism

247 Critical Perspectives On Nutrition

248 Shadowy Dealings: Anthropology Of Finance, Money, And Law

249 Ecological Discourses

253 Advanced Cultural Anthropological Theory

254 Medicine and Culture

255 Regulating Religion/Sex

258 Experimental Cultures

259 Race in Theory and Ethnography

260 Anthropology of Freedom

261 Replication, Mimesis, and Fakery

262 Documenting Cultures

267A Science and Justice: Experiments in Collaboration

267B Science and Justice Research Seminar

268A Rethinking Capitalism

268B Rethinking Capitalism

269 Global History and the Longue Durée

### Complete Language Requirement

### Pass the Qualifying Examination

### ARCHAEOLOGY TRACK REQUIREMENTS

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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.

270 History Of Archaeological Theory

270B Current Directions in Archaeological Theory

#### Two Research Methods/Laboratory Courses

Student may substitute courses in another department with adviser approval.

202A Skeletal Biology

280 Ceramic Analysis

280L Ceramic Analysis Laboratory

285 Osteology of Mammals, Birds, Fish

## Anthropology

### **Two Courses on the Archaeology of a Geographical, Temporal, or Topical Area:**

Student may substitute courses in another department with advisor approval.

275A Seminar on Early African Archaeology

275B Tutorial in Archaeology of African American Complex Societies

276A Advanced Topics in North American Archaeology

276B Mesoamerican Archaeology

287 Advanced Topics in Archaeology

273 Advanced Topics in Origins of Farming

274 Advanced Topics in Archaeology of Complex Societies

### **Two Additional Graduate Seminars**

Students may substitute a graduate seminar in cultural or physical anthropology or in another department with advisor approval. Tutorials that are taught in conjunction with undergraduate courses do not count toward this requirement.

225 The Anthropology Of Things: Sign, Gift, Commodity, Tool

279 Feminism and Gender in Archaeology

282 Household Archaeology

### **One Course in Grant Writing or Research Design**

228 Grant Writing (Cultural Anthropology)

272 Advanced Archaeological Research Design

### **One General Course in Quantitative Methods in the Social, Environmental, or Biological Sciences**

This course is usually completed in another department. Students should consult with an adviser about the appropriate course. Possible options include Psychology 2, Applied Mathematics and Statistics 7, or a course in spatial statistics.

### **Two Laboratory Apprenticeships**

298 Advanced Lab Apprenticeship

### **Complete Language Requirement**

#### **Pass the Qualifying Examination**

REQUIRED FOR ALL ANTHROPOLOGY PH.D. STUDENTS

#### **Language Requirement**

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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 the Preliminary Committee to identify the

language competencies necessary for fieldwork and scholarship and to initiate study toward meeting these needs. To meet the language requirement, competence in one language must be formally demonstrated. Each student's adviser 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 an appropriate member of the UCSC faculty or an outside assessor approved by the adviser

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 adviser

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.

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## QUALIFYING EXAMINATION

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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:

A theoretically focused dissertation research prospectus (approximately 18-25 pages, double-spaced, actual length to be determined by QE committee).

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 10-15 pages, double-spaced, each; actual length to be determined by QE committee).

For archaeology 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).

Three field statements reviewing literature on (a) a geographic cultural area, (b) a set of research methods, and (c) a theoretical tradition or theme.

## Anthropology

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### DISSERTATION

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Ph.D. candidates must prepare and submit a dissertation that is based on original research and meets the requirements of their dissertation reading committee.

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### DESIGNATED EMPHASIS

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#### COMMITTEE COMPOSITION

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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.

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#### COURSE REQUIREMENTS

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The student must take four graduate courses in anthropology, one of which must be a graduate seminar. 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.

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### WRITING REQUIREMENTS

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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 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

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## ANTHROPOLOGY FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**Donald Brenneis**

Linguistic anthropology, folklore, legal anthropology, ethnomusicology, overseas Indians, South Asia, disputing and dispute management, legal language, bureaucratic institutions, knowledge production, improvisation

**Melissa L. Caldwell**

Poverty and public health; welfare, charity, and assistance; food and consumption; gardens, nature, and landscapes; religion; socialism and postsocialism; Russia, the former Soviet Union, and Eastern Europe

**Nancy N. Chen**

Medical anthropology, visual anthropology, urban anthropology, Asian American identity, mental health, food, China

**May N. Diaz, Emerita****Shelly Errington, Emerita****Alison Galloway**

Skeletal biology, forensic anthropology, human variation, history and ethics of physical anthropology, reproductive energetics and aging

**Diane Gifford-Gonzalez, Emerita****Judith A. Habicht-Mauche**

Precontact and early contact North America; Southwest and Southern Plains; social networks and cross-cultural

interaction; migration; community and identity formation; ceramic production and exchange; technology as cultural practice; archaeometry and materials analysis

**Susan Harding, Emerita****Diane K. Lewis, Emerita****Daniel T. Linger, Emeritus****Carolyn Martin Shaw, Emerita****Olga Nájera-Ramírez**

Folklore theory, ritual, festival, dance, greater Mexican culture, history and folklore, transnationalism, identity; expressive culture, ethnomusicology, bilingual communication, gender, history, and culture of Latin America, the U.S., and Mexico

**Triloki Nath Pandey**

Native peoples of North America, cultures of India, political anthropology, anthropological theories and comparisons; native North America; tribal India; Nepal

**Richard R. Randolph, Emeritus****Lisa Rofel**

Critical theory, anthropology of modernity, popular/public culture, gender and sexuality, queer theory, transnational capitalism, postcolonial and transnational feminism, China

## Anthropology

### **Danilyn Rutherford**

Borders and frontiers, colonialism, nationalism, ethnicity, kinship, performance, Christianity, secularism, sovereignty, publics, affect, technology, governancy, theory and method in anthropology, West Papua, Indonesia, the U.S.

**Stuart A. Schlegel**, Emeritus

### **Anna Tsing**

Culture and politics; feminist theory; globalization; multi-species anthropology; social landscapes and forest ethnologies; multi-sited ethnography; Indonesia, Southeast Asia, and the U.S.

**Adrienne L. Zihlman**, Emerita

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## ASSOCIATE PROFESSOR

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### **Mark Anderson**

Racial formation, diaspora, nationalism, transnationalism, culture and power; Latin America, African diaspora

### **Mayanthi Fernando**

Religion and secularism; anthropology of Islam; gender and sexuality; multiculturalism/pluralism; modernity and its "Others"; ethnography and ethics; colonial and post-colonial France/Europe; theory and methods in the study of religion

### **Andrew Salvador Mathews**

Environmental anthropology, science and technology studies, conservation and development, climate change, environmental history, Mexico, Latin America, Italy

### **J. Cameron Monroe**

Historical archaeology, complex societies, political economy, architecture and landscape, Africa and the African diaspora

### **Megan Moodie**

Feminist theory, reproductive politics, development, legal identities, affirmative action, ethnographic methods, narrative, literature, utopias and other postsocialist/postcolonial imaginaries, connected histories and the *longue durée*, South Asia, Eastern Europe

### **Renya Ramirez**

Native American studies, Indian identity, Native Americans and anthropology, urban Indians, Native American women, cultural citizenship, expressive culture, and anti-racist education

### **Matthew Wolf-Meyer**

Anthropology and history of medicine and public health, science studies, American studies, popular culture, the United States and the United Kingdom

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## ASSISTANT PROFESSOR

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### **Chelsea Blackmore**

Pre-Columbian archaeology (Mesoamerican focus), identity formation, complex societies, class and state formation, gender, feminist/queer theory

### **Jon Daehnke**

Archaeology of the North American Pacific Coast, cultural heritage politics and law, contemporary Native American politics, human-environment interaction, landscape and place, collaborative methodologies, NAGPRA implementation and compliance, public representations of heritage and memory

### **Lars Fehren-Schmitz**

Palaeogenetics / anthropological genetics, human evolutionary ecology, evolutionary demography, gene-culture coevolution, migration theories, population history of the Americas, archaeology of South America

### **Tsim Schneider**

Anthropological archaeology, culture contact and colonialism, Spanish missions, borderlands, landscape and place, social memory, lithics, indigenous archaeology, California and North America

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## LECTURER

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**Guillermo Delgado-P.**, Emeritus

Latin American cultures; comparative indigeneity; indigenous property rights; cultures of the sacred; ecologies and peasantries; Quechua/Andean linguistics, mining, labor history; alternative/electronic journalism; anthropology in the developing world; interethnicity; urbanization; social movements; culture theory

### **Annapurna Pandey**

Women's issues; women's political and religious lives and their representation in film; media and literature dealing with India and Indian Diaspora; film-making on the experiences of the diasporic Odias in the greater bay area

**Jude Todd**, Emerita

Indigenous American world views; permaculture; culturally prescribed attitudes toward water and soil; chemical-industry influences on government, university research, and popular belief systems; transgenerational epigenetic inheritance

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## ADJUNCT ASSISTANT PROFESSOR

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### **Susan Kuzminsky**

Skeletal biology, bioarchaeology, forensic anthropology, virtual 3D anthropology, skeletal correlates of human behavior (paleodiet, health, nutrition, social identity, activities), human evolutionary biology, ancient human dispersals, NAGPRA compliance, human rights, non-

## Anthropology

destructive research methods, peopling of the Americas, Pacific Rim, prehistory of California, Chile, and Peru



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### PROFESSOR

**Raoul Birnbaum** (History of Art and Visual Culture)  
Buddhist studies, especially Chinese practices from medieval times to the present; religion and visual culture in China

**John Brown Childs**, Emeritus (Sociology)  
Ethnic conflict and transcommunal cooperation; sociology of knowledge; African American, Native American, Latino interactions

**James T. Clifford**, Emeritus (History of Consciousness)  
History of anthropology, travel, and exoticism; transnational cultural studies, museum studies, indigenous studies

**Carolyn Dean** (History of Art and Visual Culture)  
Cultural histories of the native Americas and colonial Latin America

**A. Russell Flegal** (Microbiology and Environmental Toxicology)  
Anthropogenic perturbations of biogeochemical cycles, applications of isotopic tracers in anthropology and archaeology

**Stephen R. Gliessman**, Emeritus (Environmental Studies)  
Agroecology, sustainable agriculture, tropical land use and development, alternative trade networks, sustainable livelihoods and conservation, community and agroecology

Donna Haraway (History of Consciousness), Emerita

**Paul Koch** (Earth Sciences)  
Isotope biogeochemistry, vertebrate paleontology

**Marc Mangel** (Applied Mathematics and Statistics), Emeritus

**Patricia Zavella**, (Latin American and Latino Studies)  
Transnational migration of Mexicans, women's work and domestic labor, poverty, family, sexuality and social networks, feminist studies, ethnographic research methods, and Chicana/Latino studies

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### ASSOCIATE PROFESSOR

**Jeffrey Bury** (Environmental Studies)  
Political ecology; sustainable development; Latin American studies; international relations; institutional dimensions of natural resource conservation in the global south; extractive industries; climate change; new models of conservation

**Flora Lu** (Environmental Studies)  
Ecological anthropology, human behavioral ecology, Amazon rainforest, indigenous peoples, conservation, Ecuador, culture change, market integration, indigenous resource management, political ecology, environmental justice

**Irene E Lusztig** (Film and Digital Media)  
Film and video production, experimental ethnography and essayistic nonfiction; representations of historical memory; archives, propaganda and training films; feminist film practices; medical film; autobiographical filmmaking; interactive documentary; editing

**Marcia Ochoa** (Feminist Studies)  
Gender and sexuality, race and ethnicity, Latina/o studies, media and cultural studies, ethnography of media, feminism, queer theory, geography, multimedia production, graphic design, colonialism and modernity, Latin American studies—Colombia and Venezuela

**S. Ravi Rajan** (Environmental Studies)  
Environmental history and political ecology, risk and disaster studies, science and technology studies, North-South environmental conflicts, environmental social theory, environmental ethics

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### ASSISTANT PROFESSOR

**Richard "Ed" Green** (Biomolecular Engineering)  
Genomics, computational molecular biology, genome assembly, human evolutionary genetics, ancient DNA, high-throughput sequencing, mRNA-processing and alternative splicing

**Cecilia Rivas** (Latin American and Latino Studies)  
Transnationalism; media and communication (Internet, newspapers); migration; globalization; race, ethnicity, and gender; bilingualism; consumption; El Salvador, Central America, Southern Mexico

**Elaine A. Sullivan (History)**  
Pharaonic Period Egypt; Greek and Roman Egypt; women and gender; material culture; ritual landscape; 3D modeling; Digital Humanities and the use of emerging technologies in studying the ancient world

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## ANTHROPOLOGY COURSES

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### LOWER-DIVISION COURSES

#### **1. Introduction to Biological Anthropology. F**

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.) (General Education Code(s): SI, IN.) The Staff

#### **2. Introduction to Cultural Anthropology. S**

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. (General Education Code(s): CC, IS.) The Staff

#### **3. Introduction to Archaeology. W**

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. (General Education Code(s): SI, IS.) J. Monroe

#### **42. Student-Directed Seminar.**

Seminars taught by upper-division students under faculty supervision. (See course 192.) The Staff

#### **81A. Mexican Folklorico Dance (2 credits).\***

Provides instruction in the aesthetic, cultural, and historical dimensions of Mexican folklorico dance. Students taught choreographed dances from various regions of Mexico and also learn dance techniques (tecnic) and

stage make-up application. Additional workshops and lectures offered to supplement class. Open to all students; no previous experience required. (Also offered as Latin American&Latino Studies 81A. Students cannot receive credit for both courses.) May be repeated for credit. (General Education Code(s): PR-C, A.) O. Najera Ramirez

#### **81B. Mexican Folklorico Dance (2 credits).\***

Second course in series. Provides instruction in the aesthetic, cultural, and historical dimensions of Mexican folklorico dance. (Also offered as Latin American&Latino Studies 81B. Students cannot receive credit for both courses.) May be repeated for credit. (General Education Code(s): PR-C, A.) O. Najera Ramirez

#### **81C. Mexican Folklorico Dance (2 credits).\***

Third course in series. Provides instruction in the aesthetic, cultural, and historical dimensions of Mexican folklorico dance. (Also offered as Latin American&Latino Studies 81C. Students cannot receive credit for both courses.) Prerequisite(s): course 81A or 81B. May be repeated for credit. (General Education Code(s): PR-C, A.) O. Najera Ramirez

#### **81J. Introduction to Visual Culture Lab (2 credits).\***

Optional digital photography lab. Students learn to compose shots, download photos, resize them, and put them into a meaningful sequence. Concurrent enrollment in Anthropology 80J required. Enrollment limited to 36. The Staff

#### **82. Culture and Dance of Bollywood (2 credits).\***

Course is devoted to the culture and dance of Bollywood, a popular genre of film representation of cultures and peoples of India. The course combines both theory and practice by showing films on selected themes and having students learn this dance style and music. (Formerly Crown 40.) (General Education Code(s): PR-C.) A. Pandey

#### **93. Field Study. F,W,S**

Supervised research or organized projects on anthropological topics for lower-division students. Conducted either on or off campus. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

#### **99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

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### UPPER-DIVISION COURSES

#### **100. History and Theory of Physical Anthropology. F,S**

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(s): courses 1, 2, and 3 and satisfaction of the Entry Level Writing and Composition requirements. The Staff

#### **101. Human Evolution.\***

Study of human evolution covering the last five million years. Examines the fossil evidence and emphasizes the reconstruction of behavior from

## Anthropology

the paleontological and anatomical evidence. Prerequisite(s): course 1. Offered in alternate academic years. The Staff

### **102A. Human Skeletal Biology.**

#### **F,S**

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(s): course 1. Enrollment limited to 16. The Staff

### **103. Forensic Anthropology. \***

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. Prerequisite(s): course 102A. Enrollment restricted to juniors and seniors. A. Galloway

### **103B. Forensic Anthropology and Bioarchaeology. S**

Introduces the analysis of human remains from forensic or archaeological contexts. Covers the whole range of morphological, morphometric, histological, genetic, and biochemical methods applied in bone-based anthropological analyses. Prerequisite(s): course 102A. Enrollment by permission of instructor. Enrollment limited to 25. The Staff

### **104. Human Variation and Adaptation. F**

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. Course 1 is highly recommended as preparation. (Formerly Human Adaptability.) L. Fehren-Schmitz

### **105. Human Paleopathology. \***

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(s): course 1; course 102A recommended. The Staff

### **106. Primate Behavior and Ecology. \***

The nature of primate social systems and social bonds is examined in the light of evolutionary and ecological concepts. Students cannot receive credit for this course and course 206. Prerequisite(s): course 1. The Staff

### **107. Methods and Research in Molecular Anthropology. W**

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): courses 1 and 104. Course 102A is recommended. Enrollment by permission of instructor. Enrollment limited to 15. L. Fehren-Schmitz

### **109. Evolution of Sex. \***

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(s): course 1. The Staff

### **110A. Public Life and Contemporary Issues. W**

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. (Formerly course 4.) (General Education Code(s): IM.) The Staff

### **110B. From Indiana Jones to Stonehenge: Archaeology as Popular Culture. S**

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. (General Education Code(s): IM.) C. Blackmore

### **110E. Anthropology of Global Environmental Change. \***

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. (General Education Code(s): PE-E.) The Staff

### **110F. Biocultural Approaches to Food. S**

Examines the complex and multifaceted intersections of biology, culture, and food from an anthropological perspective. Addresses issues including the biological basis of human nutrition, the agricultural revolution, taboos,

## Anthropology

and social identity, as well as current problems. The Staff

### **110G. Barrio Popular Culture. F**

Introduces students to a broad sampling of verbal and nonverbal forms of Mexican folklore. Concentrates on experiencing these forms through texts, film, and if possible, performances. Attention to how these forms have been used by scholars to comment on Mexican culture is an underlying theme. Knowledge of Spanish is useful but not required. (Formerly course 80G.) (General Education Code(s): CC, E.) O. Najera Ramirez

### **110H. Acoustic Culture. \***

Explores relationships between culture and the acoustic worlds, including environmental, verbal, and musical, which humans inhabit. How can paying attention to cultures of listening and sound-making help us think about cultural life and experience in new ways? (Formerly course 80H.) (General Education Code(s): CC.) D. Brenneis

### **110K. Culture through Food. \***

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. (Formerly course 80K.) (General Education Code(s): CC.) N. Chen

### **110O. Postcolonial Britain and France. \***

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. (Also offered as

History 181A. Students cannot receive credit for both courses.) (General Education Code(s): CC, E.) M. Fernando

### **110P. India and Indian Diaspora through Film. F**

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.) (General Education Code(s): CC, E.) A. Pandey

### **110R. Discourses in American Religions and Their Role in Public Life. \***

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. (General Education Code(s): IM.) D. Rutherford, S. Harding

### **110T. Motherhood in American Culture. \***

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. (Formerly course 80T.) (General Education Code(s): ER.) M. Moodie

### **110W. Land and Waterscapes Entropology. W**

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. (General Education Code(s): PE-E.) G. Delgado-P

### **111. Human Ecology. \***

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. L. Fehren-Schmitz

### **112. Life Cycles. \***

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(s): course 1. The Staff

### **113. Tutoring Writing in Anthropology (2 credits). F**

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. The Staff

### **119. Indigenous Visual Culture. \***

Examines the relationship between visual cultures and indigenous peoples. First, class discusses what

## Anthropology

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. R. Ramirez

### **120. Culture in Film. F**

Introduces current and historical issues in visual anthropology, using film as a medium with which to represent culture. Raises questions about visual representation and advocacy in the context of global inequalities. Prerequisite(s): course 2 or 80J or Film 20A or 20B, or History of Art and Visual Culture 10D, 10E, 10F or 10G. (General Education Code(s): IM.) The Staff

### **120L. Culture in Film Laboratory (2 credits). \***

This lab in video production is to train students in Culture in Film. The video lab, through lectures, demonstrations, hands-on instruction, and review of students' work will enable students enrolled in Culture in Film to learn the fundamentals of film/video pre-production, production, and post-production skills. Portfolio review prior to enrollment and concurrent enrollment in course 120 required. Enrollment limited to 15. The Staff

### **121. Socialism. \***

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. M. Caldwell

### **122. Postsocialism. \***

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. L. Rofel

### **123. Psychological Anthropology. \***

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(s): course 2. D. Linger

### **124. Anthropology of Religion. \***

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. The Staff

### **126. Sexuality and Society in Cross-Cultural Perspective. \***

The meaning and social processes associated with sexuality in selected societies. Examination of variations in sexual expressions and control of sexuality, and in economic and political organizations, highlights the interrelationship of sex and society. Prerequisite(s): course 2. The Staff

### **127. Ethnographies of Capitalism. \***

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. L. Rofel

### **128. Contemporary American Evangelical Cultures. \***

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.) S. Harding

### **129. Other Globalizations: Cultures and Histories of Interconnection. \***

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.

Prerequisite(s): course 2. A. Tsing

### **130. Ethnographic Area Studies.**

#### **130A. Peoples and Cultures of Africa. \***

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. (General Education Code(s): CC, E.) The Staff

#### **130B. Brazil. \***

Examines Brazilian culture and its link to interpersonal relationships, religion, politics, and psychological experience. Prerequisite(s): course 2. (General Education Code(s): CC, E.) The Staff

## Anthropology

### **130C. Politics and Culture in China.** \*

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. (General Education Code(s): CC, E.) L. Rofel

### **130E. Culture and Politics of Island Southeast Asia.** \*

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(s): course 2. (General Education Code(s): CC, E.) The Staff

### **130F. African Diasporas in the Americas.** \*

Focuses on African diasporas of the Caribbean, United States, and Latin America. Themes include: theorizing diaspora, historical formations, slavery, analytical approaches to cultures of the African diaspora, religion, music, comparative identity formation and racism, gender dynamics, social movements, and transnationalism. (General Education Code(s): CC, E.) M. Anderson

### **130G. Asian Americans in Ethnography and Film.** \*

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. (General Education Code(s): E.) N. Chen

### **130H. Ethnography of Russia and Eastern Europe.** \*

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. (General Education Code(s): CC, E.) M. Caldwell

### **130I. Cultures of India. S**

An examination of anthropological studies of tribal, rural, and urban cultures of India and a look at changes taking place in India. Prerequisite(s): course 2. Offered in alternate academic years. (General Education Code(s): CC, E.) A. Pandey

### **130J. Politics and Statemaking in Latin America.** \*

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. (General Education Code(s): CC.) A. Mathews

### **130L. Ethnographies of Latin America. F**

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(s): course 2. (General Education Code(s): CC, E.) G. Delgado-P

### **130M. Inside Mexico. W**

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. (General Education Code(s): CC, E.) The Staff

### **130N. Native Peoples of North America.** \*

A survey of Native American cultures and experience during the past century, with emphasis on Pueblo cultures of the American Southwest. (General Education Code(s): ER, E.) The Staff

### **130T. Religion and Politics in the Muslim World.** \*

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.) (General Education Code(s): CC, E.) M. Fernando

### **130U. Central America.** \*

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. M. Anderson

## Anthropology

### **130V. Ethnography of Russia. \***

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. M. Caldwell

### **130W. Ethnography of Eastern Europe. \***

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. M. Caldwell

### **130X. Special Topics in Ethnography. F,W,S**

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. May be repeated for credit. The Staff

### **131. Women in Cross-Cultural Perspective. W**

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. Prerequisite(s): course 2. R. Ramirez

### **131H. Russian-Language Readings Course: Readings in Anthropology of Russia (2 credits). \***

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 course 130H, Ethnography of Russia and Eastern Europe. Prerequisite(s): course 130H and proof of Russian proficiency in reading and writing. Enrollment by permission of instructor. Enrollment limited to 10. M. Caldwell

### **132. Photography and Anthropology. \***

Moving historically from woodcuts and paintings to the World Wide Web, but emphasizing the invention and development of documentary photography, this course explores the world of images depicting society and culture. Major theoretical approaches to "reading" pictures will be emphasized, and students must produce a final project incorporating visual images. Prerequisite(s): course 2 or History of Art and Visual Culture 10D or 10E or 10F or 10G or Art 30. (General Education Code(s): IM.) The Staff

### **132L. Photography and Anthropology Laboratory (2 credits). \***

This still photography lab trains students in the basic operations and techniques of the camera and the creation of a set of still photographs to use for social documentation. It includes lectures, demonstrations, hands-on instruction, and a continuous review of the students' work in progress. It does not include darkroom work. Concurrent enrollment in course 132 required. Enrollment restricted to anthropology majors. Enrollment limited to 30. The Staff

**133. Narratives of the Popular. \***  
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. S. Harding

### **134. Medical Anthropology: An Introduction. \***

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 course 254. Prerequisite(s): course 2. N. Chen

### **135A. Cities. \***

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. N. Chen

### **136. The Biology of Everyday Life. \***

Addresses cross-cultural attitudes to the human body and its everyday biological concerns: sleeping, eating, breathing, sex, and defecation. Prerequisite(s): course 2. The Staff

### **137. Consuming Culture. \***

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. M. Caldwell

## Anthropology

### **138. Political Anthropology. \***

The ideas, in selected non-Western societies, about the nature of power, order, social cohesion, and the political organization of these societies. (Also offered as Legal Studies 138. Students cannot receive credit for both courses.) Offered in alternate academic years. The Staff

### **139. Language and Culture. W**

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(s): course 2. D. Brenneis

### **140. Art, Artists, Artifacts. \***

Studies the ways of interpreting non-Western art, both in the context of the Western art world and in the context of the societies that produced the art forms. The Staff

### **141. Anthropology of Developing Countries: Environment, Water, Entropy. \***

Focuses on developing countries, those countries experiencing fast deruralization and ecological crises. Students learn the reach of entropic interconnectiveness given the fact that forms of inequality organize the system. Readings illustrate the theories and methods anthropologists use to approximate cultural realities to readers, scholars, and activists. Prerequisite(s): course 2. G. Delgado-P

### **142. Anthropology of Law. \***

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. (Also offered as Legal Studies 142. Students cannot receive credit for both courses.) Enrollment restricted to anthropology and legal studies majors. D. Brenneis

### **143. Performance and Power. \***

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(s): course 2 or any other Anthropology course. D. Brenneis

### **144. Anthropology of Poverty and Welfare. F**

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. M. Caldwell

### **145X. Special Topics in Socio-Cultural Anthropology. F,W,S**

Taught annually on a rotating basis by faculty members. Each year's topic varies by instructor and is announced by the department. May be repeated for credit. The Staff

### **146. Anthropology and the Environment. W**

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. Prerequisite(s): course 2. (General Education Code(s): PE-E.) A. Mathews

### **148. Gender and Global Development. \***

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.) (Also offered as Feminist Studies 148. Students cannot receive credit for both courses.) M. Moodie

### **150. Communicating Anthropology. F**

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(s): two of the following courses: 1, 2, or 3; satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to sophomore and junior anthropology majors. (General Education Code(s): W.) M. Fernando

### **151. Workshop in Ethnography. \***

Through demonstration, practice, and participation, acquire skills in collecting and analyzing cultural data. Work with members of other cultures and with each other to

## Anthropology

learn to identify significant cultural patterns. Lectures and readings provide added perspective and a theoretical base. Prerequisite(s): course 2. Enrollment limited to 20. The Staff

### **152. Survey of Cultural Anthropological Theory. W**

Major figures, ideas, and writings in 19th- and 20th-century cultural anthropology surveyed. Students cannot receive credit for this course and course 252. Prerequisite(s): course 2 and satisfaction of the Entry Level Writing and Composition requirements; enrollment restricted to anthropology majors. (General Education Code(s): W.) D. Rutherford

### **153. Medicine and Colonialism. \***

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(s): courses 2 and 134. The Staff

### **154. Multimedia Ethnography. \***

Students learn the fundamentals of photography or video production and audio recording in order to create mini-ethnographies. Prerequisite(s): courses 1, 2, and 3. Concurrent enrollment in course 154L is required. Enrollment restricted to anthropology majors. (General Education Code(s): PR-C.) The Staff

### **154L. Multimedia Laboratory (2 credits). \***

Designed to instruct in aesthetics and technical production of a short digital slideshow. Using iMovie3 editing program, produce a digital slideshow incorporating sound (narration, music, and sound effects) and still images. Concurrent

enrollment in course 154 required. The Staff

### **157. Modernity and Its Others. \***

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. M. Fernando

### **158. Feminist Ethnographies. \***

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. M. Moodie

### **159. Race and Anthropology. \***

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. (General Education Code(s): ER.) M. Anderson

### **160. Reproductive and Population Politics. \***

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. M. Moodie

### **161. The Anthropology of Food. \***

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. M. Caldwell

### **162. Anthropology of Displaced Persons. \***

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. M. Caldwell

### **163. Kinship. \***

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 course 263. D. Rutherford

### **164. The Anthropology of Dance. \***

An intense reading seminar which critically reviews anthropological works in dance ethnography and dance theory. Recommended for anthropology majors. Prerequisite(s): course 2. Enrollment limited to 25. O. Najera Ramirez

### **166. States, Bureaucracies, and Other Cosmological Propositions. \***

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

## Anthropology

rituals, practices of mapping and classification, forms of citizenship.  
A. Mathews

### **170. History of Archaeological Theory. F**

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 course 270. Prerequisite(s): course 3; satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to anthropology and Earth sciences/anthropology combined majors. Recommended for juniors. (General Education Code(s): W.) J. Habicht Mauche

### **171. Materials and Methods in Historical Archaeology. \***

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. Enrollment limited to 20. C. Blackmore

### **172. Archaeological Research Design. \***

Introduces theories and methods for recovering and analyzing archaeological data. Critically explores the nature of archaeological evidence and how archaeologists know what they know. Strongly recommended for those contemplating further studies in archaeology. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, course 3, and one upper-division archaeology course. Strongly recommended for those contemplating further studies in archaeology. Enrollment limited to

25. Offered in alternate academic years. (General Education Code(s): W.) C. Blackmore

### **173. Origins of Farming. \***

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 course 273. Enrollment restricted to juniors and seniors. Offered in alternate academic years. The Staff

### **174. Origins of Complex Societies. \***

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 course 174. Prerequisite(s): course 3. C. Blackmore

### **175A. Early African Archaeology. \***

Archaeological history of Africa from the first 2.5 million-year-old artifacts to the emergence of African pastoralism and farming. Disciplinary models and assumptions critically examined in their historic and political contexts. Students cannot receive credit for this course and course 275A. (Formerly African Archaeology: 2.5 Million BP to Farming.) Prerequisite(s): course 3 or by permission of instructor. Enrollment restricted to junior and senior anthropology and Earth sciences/anthropology combined

majors. Enrollment limited to 45. The Staff

### **175B. African Complex Societies. \***

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 Anthropology 275B. Prerequisite(s): course 3; course 175A strong recommended. J. Monroe

### **176A. North American Archaeology. W**

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(s): course 3 or consent of instructor. J. Habicht Mauche

### **176B. Meso-American Archaeology. \***

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. Prerequisite(s): course 3. C. Blackmore

### **176C. Archaeology of the American Southwest. \***

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). Topics include the greater environment; early foraging culture; the development of

## Anthropology

agriculture and village life; the emergence and decline of regional alliances; abandonment and reorganization; and changes in social organization, external relations, and trade. Prerequisite(s): courses 3 and 176A. J. Habicht Mauche

### **176D. Colonial Encounters in the Americas. \***

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(s): courses 2 and 3. (General Education Code(s): ER.) J. Habicht Mauche

### **176E. Archaeology of the Pacific Northwest. F**

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(s): course 3. J. Daehnke

### **177. European Conquest of the Americas. \***

Uses ethnographic, archaeological, and historical sources to examine the clash of cultures between Native Americans and Europeans during the 15th through 19th centuries. Focuses on the social, political, and demographic impacts of contact on Native American societies. Prerequisite(s): courses 2 and 3. Enrollment limited to 34. J. Habicht Mauche

### **178. Historical Archaeology: A Global Perspective. W**

Introduces 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 Anthropology 278. Prerequisite(s): course 3 or consent of instructor. J. Monroe

### **179. Slavery in the Atlantic World: Historical and Archaeological Perspectives. \***

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. (Also offered as History 158C. Students cannot receive credit for both courses.) (General Education Code(s): PR-E.) J. Monroe

### **180. Ceramic Analysis in Archaeology. S**

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 are billed a course materials fee. Students cannot receive credit for

this course and course 280.

Prerequisite(s): course 3.

Concurrent enrollment in course 180L required. Enrollment restricted to anthropology majors. J. Habicht Mauche

### **180L. Ceramic Analysis Laboratory (2 credits). S**

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 course 280L. Prerequisite(s): course 3. Concurrent enrollment in course 180 required. Enrollment restricted to anthropology majors. Enrollment limited to 16. J. Habicht Mauche

### **182A. Lithic Technology. W**

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(s): course 3. Enrollment limited to 20. The Staff

### **184. Zooarchaeology. F**

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 course 284. Prerequisite(s): course 3; concurrent enrollment in course 184L is required. The Staff

**184L. Zooarchaeology Laboratory (2 credits). F**

Practical laboratory in archaeological analysis, with demonstrations and exercises on human-caused modifications to animal bones and non-human modifications to animal bones. Prerequisite(s): course 3 and concurrent enrollment in course 184. Enrollment restricted to anthropology majors and combined Earth sciences/anthropology majors. Enrollment limited to 45. The Staff

**185. Osteology of Mammals, Birds, and Fish. \***

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 course 285. Prerequisite(s): courses 184 or 102 or Biology 138/L or Earth Sciences 100 or Environmental Studies 105/L, and permission of instructor. Enrollment limited to 16. Offered in alternate academic years. The Staff

**187. Cultural Heritage in Colonial Contexts. S**

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. J. Daehnke

**188. Practicum in Archaeology (2 credits). \***

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 5 hours per week of hands-on instruction. Prerequisite(s): courses 1, 2, and 3. Enrollment limited to 10. May be repeated for credit. The Staff

**189. Archaeology Field Methods. S**

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. (Formerly Field Methods in Archaeology. Enrollment limited to 15. (General Education Code(s): PR-E.) The Staff

**190X. Special topics in Archaeology-Physical Anthropology. \***

Special topics in archaeology-physical anthropology are taught annually on a rotation basis by various faculty members. The precise focus of each year's course varies according to the instructor and is announced by the department. Prerequisite(s): courses 1 and 3. May be repeated for credit. The Staff

**192. Directed Student Teaching. F,W,S**

Teaching of a lower-division seminar under faculty supervision. (See course 42.) Students submit petition to sponsoring agency. The Staff

**193. Field Study. F,W,S**

Students submit petition to sponsoring agency. The Staff

**194. Senior Seminar**

**194A. Anthropology of Dead Persons. \***

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 courses 1, 2, and 3. Enrollment restricted to senior anthropology majors. Enrollment by permission of instructor. Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements, and courses 1, 2, and 3. Enrollment restricted to senior anthropology majors. Enrollment limited to 16. (General Education Code(s): W.) A. Galloway

**194B. Chimpanzees: Biology, Behavior, and Evolution. \***

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(s): courses 1, 2, and 3; satisfaction of the Entry Level Writing and Composition requirement. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) The Staff

**194C. Feminist Anthropology. \***

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

## Anthropology

this course and course 279. (Formerly Feminism and Gender in Archaeology.) Prerequisite(s): courses 1, 2, and 3, and satisfaction of the Entry Level Writing and Composition requirement. Enrollment restricted to seniors. Enrollment limited to 20. (General Education Code(s): W.) C. Blackmore

### **194D. Tribes/Castes/Women. \***

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(s): courses 1, 2, and 3. Satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) M. Moodie

### **194E. Belief. \***

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(s): courses 1, 2, and 3 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) D. Rutherford

### **194F. Memory. S**

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(s): courses 1, 2, and 3; satisfaction of the Entry Level Writing and Composition requirement. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) M. Caldwell

### **194G. Politics and Secularism. \***

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(s): courses 1, 2, and 3, and satisfaction of the Entry Level Writing and Composition requirements; enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) M. Fernando

### **194H. Paleoanthropology. F**

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(s): satisfaction of the Entry Level Writing and Composition requirements; courses 1, 2, and 3. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) The Staff

### **194I. Consumption and Consumerism. \***

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(s): courses 1, 2, and 3; satisfaction of the Entry Level Writing and Composition requirement. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) M. Anderson

### **194K. Reading Ethnographies. \***

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(s): courses 1, 2, and 3; satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) M. Fernando

### **194L. Archaeology of the African Diaspora. \***

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(s): courses 1, 2, 3 and an upper division course in archaeology; satisfaction of the Entry Level Writing and Composition requirement. Enrollment restricted to senior

## Anthropology

anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) J. Monroe

### **194M. Medical Anthropology. S**

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(s): satisfaction of the Entry Level Writing and Composition requirements; courses 1, 2, 3, and 134. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) N. Chen

### **194N. Comparison of Cultures. F**

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(s): satisfaction of Entry Level Writing and Composition requirements; courses 1, 2, and 3. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) T. Pandey

### **194O. Masculinities. \***

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(s): courses 1, 2, and 3 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) M. Moodie

### **194P. Space, Place, and Culture. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) The Staff

### **194Q. Race, Ethnicity, Nation. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements, and courses 1 and 2 and 3. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) M. Anderson

### **194R. Religion, Gender, Sexuality. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements, and courses 1 and 2 and 3. Enrollment restricted to senior anthropology

majors. Enrollment limited to 20. (General Education Code(s): W.) M. Fernando

### **194S. Hearing Culture: The Anthropology of Sound. F**

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(s): satisfaction of the Entry Level Writing and Composition requirements; courses 1, 2, and 3. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) D. Brenneis

### **194T. Poverty and Inequality. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements; courses 1, 2, and 3. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) M. Caldwell

### **194U. Environmental Anthropology: Nature, Culture, Politics. W**

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(s): satisfaction of the Entry Level

## Anthropology

Writing and Composition requirements. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) A. Tsing

### **194V. Picturing Cultures. \***

A historical, analytical, and practical exploration of the uses of still and moving pictures in ethnographic representations, research, and production. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; courses 1, 2, and 3; and course 80J, 120, 132, or 154. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) The Staff

### **194W. The Anthropology of Social Movements. \***

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(s): courses 1, 2, and 3, and satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) G. Delgado-P

### **194X. Women in Politics: A Third World Perspective. S**

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(s): satisfaction of the Entry Level Writing and Composition requirements; courses 1, 2, and 3. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) A. Pandey

### **194Y. Archaeologies of Space and Landscape. \***

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(s): courses 1, 2, 3, and an upper-division archaeology course; satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) J. Monroe

### **194Z. Emerging Worlds. W**

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(s): courses 1, 2, and 3, and satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) L. Rofel

### **195A. Senior Thesis Seminar. F**

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): courses 1 and 107, and either course 101, or course 104, or course 105. Enrollment is restricted to senior anthropology majors and by permission of the instructor. Enrollment limited to 10. L. Fehren-Schmitz

### **195B. Senior Thesis Research (3 credits). W**

Students conduct the research projects they proposed in course 195A. Students have weekly group meetings with the research supervisor. Prerequisite(s): course 195A. Enrollment restricted to senior anthropology majors. Enrollment limited to 10. L. Fehren-Schmitz

### **195C. Senior Thesis Capstone (3 credits). S**

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(s): course 195B. Enrollment restricted to senior anthropology majors. Enrollment limited to 10. L. Fehren-Schmitz

### **196C. Traveling Cultures. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements; courses 1, 2, and 3. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) M. Moodie

### **196D. Food and Medicine. \***

Examines the intersections of food, medicine, and culture with special

## Anthropology

focus on nutrition, cultural knowledge, industrial foodways, genetically modified organisms (GMOs), ethnopharmacology, food safety, and biosecurity.

Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; and courses 1, 2, and 3. Enrollment limited to 20. (General Education Code(s): W.) N. Chen

### **196E. Pastoralists Past and Present. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements; and courses 1, 2, and 3. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) The Staff

### **196F. The Anthropology of Things: Gift, Sign, Commodity, Tool. \***

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 course 225. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; and courses 1, 2, and 3. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) D. Rutherford

### **196G. Advanced Topics in Folkloristics. \***

Examines selected topics and issues in the field of folklore: specific topics vary each quarter. For students with a demonstrated interest in folklore and/or popular culture. Prerequisite(s): courses 1, 2, and 3; and satisfaction of the Entry Level Writing and Composition requirements; and a course in folklore and/or popular culture is strongly recommended. Enrollment limited to 20. (General Education Code(s): W.) O. Najera Ramirez

### **196H. Global History and the Longue Duree. \***

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 course 269. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; and courses 1, 2, and 3. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. (General Education Code(s): W.) M. Moodie

### **196I. Hard Problems. \***

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(s): courses 1, 2, and 3; and satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 20. (General Education Code(s): W.) The Staff

### **196J. Imagining America. S**

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(s): courses 1, 2, and 3 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. J. Daehnke

### **196K. Settler Colonialism. S**

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(s): courses 1, 2, and 3 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to senior anthropology majors. Enrollment limited to 16. R. Ramirez

### **196L. Archaeology of the American Southwest. \***

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(s): courses 1, 2, and 3 and satisfaction of the Entry Level Writing and Composition requirements. Course 178 strongly recommended. Enrollment restricted to senior anthropology majors. Enrollment limited to 20. J. Habicht Mauche

### **196M. Modernity and its Others. \***

Examines how Western modernity has interpreted various forms of radical difference, beginning with the 15th-century conquest of the

## Anthropology

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(s): courses 1, 2, and 3; and satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to seniors. Enrollment limited to 20. M. Fernando

### **196T. Archaeology of Technology. \***

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(s): courses 1 and 2 and 3, and satisfaction of the Entry Level Writing and Composition requirement. Enrollment is restricted to senior anthropology majors. Enrollment limited to 20. J. Habicht Mauche

**197. Laboratory Tutorial. F,W,S**  
Independent laboratory research on selected topics in archeology and physical anthropology. Interview with appropriate instructor required. May be repeated for credit. The Staff

**197F. Laboratory Tutorial (2 credits). F,W,S**  
Independent laboratory research on selected topics in archaeology and physical anthropology. Interview with appropriate instructor required. Enrollment restricted to anthropology majors. May be repeated for credit. The Staff

**198. Independent Field Study. F,W,S**  
Off-campus field study. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**198G. Independent Field Study (3 credits). F,W,S**  
Off-campus field study. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199. Tutorial. F,W,S**  
Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## Graduate Courses

**200. Theoretical Foundations of Physical Anthropological Research. \***  
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. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

**200A. Core Graduate Course (10 credits). F**  
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. Enrollment restricted to anthropology graduate students. Enrollment limited to 12. A. Mathews

**200B. Core Graduate Course. W**  
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. Enrollment restricted to anthropology graduate students. Enrollment limited to 12. M. Fernando

**201. Human Evolution. \***  
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. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

**202A. Skeletal Biology. \***  
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(s): course 102A or permission of instructor. Enrollment restricted to graduate students. Enrollment limited to 5. The Staff

**206. Primate Behavior. \***  
An overview of primate evolution and review of the major groups of primates in terms of their ecological, locomotor, dietary, and social adaptations. Theoretical frameworks, such as behavioral ecology, sexual selection, and life history, are evaluated from long-term studies of primate behavior. Students cannot receive credit for this course and course 106. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

## Anthropology

### **208A. Ethnographic Practice. S**

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. Enrollment restricted to anthropology graduate students. Enrollment limited to 15. M. Caldwell

### **208L. Video Laboratory (2 credits). \***

Provides students with hands-on training with a variety of audiovisual equipment. Through lectures, demonstrations, hands-on field exercises, and review of students' media exercises, students learn the fundamentals of photography, video production, and audio recording in the field. Concurrent enrollment in course 208A required; enrollment restricted to anthropology graduate students. Enrollment limited to 15. N. Chen

### **210R. Religion in American Politics and Culture. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. D. Rutherford, S. Harding

### **211. Human Ecology. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

### **212. The Human Life Cycle. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

### **214. Culture and Power. \***

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. Enrollment is restricted to graduate students. Enrollment limited to 15. The Staff

### **219. Religions, States, Secularities. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. S. Harding

### **220. Cartographies of Culture. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. M. Caldwell

### **225. The Anthropology of Things: Sign, Gift, Commodity, Tool. \***

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 course 196F. Enrollment restricted to graduate students. Enrollment limited to 15. J. Habicht Mauche

### **228. Grant Writing. F**

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. Enrollment restricted to anthropology graduate students. Enrollment limited to 15. May be repeated for credit. M. Caldwell

### **229. Constructing Regions. \***

Discusses centrality of the idea of "regions" in studies of culture, the history of "locating" social theory, and debates about area studies.

## Anthropology

Students develop area of transregional bibliographies. Primarily for second- or third-year anthropology graduate students reading "area" literatures. Enrollment restricted to graduate students. Enrollment limited to 15. M. Anderson

**230. Bodies, Images, Screens. \***  
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. (Formerly Photography and Image Culture.) Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

**231. Intimacy and Affective Labor. \***  
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. Enrollment restricted to graduate students. Enrollment limited to 15. M. Moodie

**232. Bodies, Knowledge, Practice. \***  
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. Enrollment restricted to graduate students. Enrollment limited to 15. N. Chen

**234. Feminist Anthropology. \***  
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. Enrollment restricted to graduate students. Enrollment limited to 15. M. Moodie

**235. Language and Culture. \***  
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. Enrollment restricted to graduate students. Enrollment limited to 15. D. Brenneis

**236. On Insults. \***  
What is the role of insult in social and legal life (from play to jokes to ritual to war and from blasphemy to defamation to hate speech)? Emphasizes philosophical, anthropological, psychoanalytic, and legal approaches to the issues. Enrollment restricted to graduate students and by permission of instructor. (Formerly Philosophy 290Y.) (Also offered as History of Consciousness 236. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. J. Neu

**238. Advanced Topics in Cultural Anthropology. \***  
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. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

**241. Social Justice. \***  
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. Enrollment restricted to graduate students. Enrollment limited to 15. M. Caldwell

**243. Cultures of Capitalism. \***  
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. Enrollment restricted to graduate students. Enrollment limited to 15. L. Rofel

**246. Advanced Readings in Environmental Anthropology. W**  
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. Enrollment is restricted to graduate students. Enrollment limited to 15. A. Mathews

## Anthropology

### **247. Critical Perspectives on Nutrition. \***

Examines emerging critiques on the science, communication, and practice of nutrition using multidisciplinary approaches. Special attention is given to the effects of modern nutrition. Enrollment restricted to graduate students. Enrollment limited to 15. J. Guthman

### **248. Shadowy Dealings: Anthropology of Finance, Money, and Law. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. A. Mathews

### **249. Ecological Discourses. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. A. Tsing

### **252. Survey of Cultural Anthropological Theory. W**

Major figures, ideas, and writing in 19th- and 20th-century cultural anthropology surveyed. Students cannot receive credit for this course and course 152. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

### **253. Advanced Cultural Theory. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. L. Rofel

### **254. Medicine and Culture. \***

Surveys medicine cross-culturally, with particular focus on power, tradition, and theories of embodiment. Students cannot receive credit for this course and course 134. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

### **255. Regulating Religion/Sex. \***

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.) Enrollment is restricted to graduate students. Enrollment limited to 15. M. Fernando

### **258. Experimental Cultures. \***

Addresses the use of experiments in anthropological research, theory, and writing. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

### **259. Race in Theory and Ethnography. \***

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.) Enrollment is

restricted to graduate students. Enrollment limited to 15. M. Anderson

### **260. Anthropology of Freedom. \***

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. Enrollment restricted to graduate students. M. Fernando

### **261. Replication, Mimesis, and Fakery. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

### **262. Documenting Cultures. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

### **263. Kinship. \***

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.

## Anthropology

Students cannot receive credit for this course and course 163. Enrollment restricted to graduate students. Enrollment limited to 15. D. Rutherford

### **267A. Science and Justice: Experiments in Collaboration. \***

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 by permission of instructor. Enrollment restricted to graduate students. (Also offered as Feminist Studies 268A. Students cannot receive credit for both courses.) Enrollment limited to 15. J. Reardon

### **267B. Science and Justice Research Seminar. \***

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): Sociology 268A, Biomolecular Engineering 268A, Feminist Studies 268A, or Anthropology 267A. Enrollment by permission of instructor. Enrollment restricted to graduate students. (Also offered as Biomolecular Engineering 268B. Students cannot receive credit for both courses.) Enrollment limited to 15. The Staff

### **268A. Rethinking Capitalism. \***

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). (Also offered as History of Consciousness 268A. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. Enrollment limited to 15. R. Meister

### **268B. Rethinking Capitalism. \***

Course 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? (Also offered as History of Consciousness 268B. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. Enrollment limited to 15. R. Meister

### **269. Global History and the Longue Duree. \***

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 course 196H. Enrollment restricted to graduate students. Enrollment limited to 15. A. Tsing

### **270. History of Archaeology. \***

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 course 170. Enrollment restricted to graduate students. Enrollment limited to 15. J. Habicht Mauche

### **270A. Archaeology Graduate Core Course: History of Archaeological Theory. F**

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 course 270. Enrollment is restricted to graduate students. Enrollment limited to 15. J. Habicht Mauche

### **270B. Current Directions in Archaeological Theory. W**

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 course 270, but not a substitute. Prerequisite(s): course 270. Enrollment is restricted to graduate students. Enrollment limited to 15. J. Daehnke

### **272. Advanced Archaeological Research. S**

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). Enrollment

## Anthropology

restricted to graduate students. Enrollment limited to 15. C. Blackmore

### **273. Origins of Farming. \***

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 course 173. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

### **274. Origins of Complex Societies. \***

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 course 174. Enrollment restricted to graduate students. Enrollment limited to 15. C. Blackmore

### **275A. Seminar on Early African Archaeology. \***

Tutorial on archaeology of Africa, from 2.5 million years ago to emergence of African pastoralism and farming. Weekly examination of disciplinary models and assumptions in historic context, emphasizing overarching themes in prehistoric archaeology. Students cannot receive credit for this course and course 175A. (Formerly Tutorial on African Archaeology.) Enrollment restricted to graduate students or by consent of instructor. Enrollment limited to 15. The Staff

### **275B. Tutorial in Archaeology of African Complex Societies. \***

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 course 175B. Prerequisite(s): Enrollment restricted to graduate students. Enrollment limited to 15. J. Monroe

### **276A. Advanced Topics in North American Archaeology. W**

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. Enrollment restricted to graduate students. Enrollment limited to 15. J. Habicht Mauche

### **276B. Mesoamerican Archaeology. \***

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 course 176B. Enrollment restricted to graduate students. Enrollment limited to 15. C. Blackmore

### **278. Tutorial on Historical Archaeology. \***

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 course 178. Enrollment restricted to

graduate students. Enrollment limited to 15. The Staff

### **279. Feminism and Gender in Archaeology. \***

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 course 194C. Enrollment restricted to graduate students. Enrollment limited to 15. C. Blackmore

### **280. Advanced Ceramic Analysis. S**

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 course 180. Enrollment restricted to graduate students. Concurrent enrollment in Anthropology 280L required. Enrollment limited to 5. J. Habicht Mauche

### **280L. Advanced Ceramic Analysis Laboratory (2 credits). S**

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 course 180L. Enrollment restricted to graduate students. Concurrent enrollment in Anthropology 280 required. Enrollment limited to 5. J. Habicht Mauche

## Anthropology

### **282. Household Archaeology. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. C. Blackmore

### **284. Tutorial in Zooarchaeology. \***

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 course 184. (Formerly Zooarchaeological Research Design.) Enrollment restricted to graduate students. The Staff

### **285. Osteology of Mammals, Birds, and Fish. \***

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 course 185. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

### **287. Advanced Topics in Archaeology. S**

A graduate seminar on advanced theoretical or methodological topics pertinent to advanced graduate student and faculty interests. Enrollment restricted to graduate students or by consent of instructor. Enrollment limited to 12. J. Monroe

### **292. Graduate Colloquium (2 credits). F,W,S**

Designed to offer an institutionalized mechanism for the presentation of research papers and teaching efforts by faculty and advanced graduate students. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **294N. Comparison of Cultures. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. T. Pandey

### **297. Independent Study. F,W,S**

Students submit petition to sponsoring agency. The Staff

### **298. Advanced Laboratory Apprenticeship. F,W,S**

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. May be repeated for credit. The Staff

### **299. Thesis Research. F,W,S**

Prerequisite(s): petition on file with sponsoring agency. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# ART

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2015-16 General Catalog

Elena Baskin Visual Arts Studios

Room E-104

(831) 459-2272

visart@ucsc.edu

<http://art.ucsc.edu>

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## PROGRAM DESCRIPTION

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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 skills for art production in a variety of media within the contexts of critical thinking and broad-based social perspectives.

The art program at UCSC is composed of courses in drawing, painting, photography, sculpture, print media, intermedia, critical theory, electronic art, public art, 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 management, museum and gallery practices, communication technologies, public school teaching, media arts, and publishing. Many students who want to teach at the college level continue their education in graduate school.

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### ART UNDERGRADUATE PROGRAM LEARNING OUTCOMES

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Students who earn a 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 communication through 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.

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### DECLARATION OF THE ART MAJOR— FROSH

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Students may apply for admission to the art major after completing two of the following: Art 10D, Art 10E, or Art 10F. While completing this lower-division coursework, it is critical that each student meet with a faculty adviser regarding the student's potential to proceed to the major level.

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### DECLARATION OF THE ART MAJOR— JUNIOR TRANSFER STUDENTS

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Junior transfer students are accepted into the art major for fall quarter after passing a portfolio review in early April. Their acceptance is contingent upon their acceptance to UCSC. Acceptance to UCSC does not guarantee admittance to the art program, nor does passing the portfolio review guarantee that UCSC will accept the student to the university. Transfer students must identify themselves as potential art majors when applying to the university in order to receive information on the portfolio review deadlines and the materials required for the review. All junior transfers will be required to take Art 194, Forms and Ideas in their junior year at UCSC in lieu of the first-year foundation program requirements. Junior transfer students must pass the portfolio review and be admitted to UCSC to become art majors. If a student is admitted to UCSC and does not pass the Art Department portfolio review, it is imperative that this student pursue another major upon admittance. Students will be notified of the results of the review before they need to submit their Statement of Intent to Register for UCSC.

## REQUIREMENTS OF THE ART MAJOR

The minimum requirements for art majors who were admitted to UCSC in their frosh year are completion of eight lower-division and eight upper-division courses and satisfaction of the senior comprehensive requirement. Junior transfer students complete five lower-division and eight upper-division courses and their senior comprehensive requirement. 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 adviser. In courses taken outside the UCSC Art Department, students must have received a grade of B or higher. Students should plan carefully when using this option.

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

### LOWER-DIVISION REQUIREMENTS

Students complete eight courses as follows:

**The Foundation** (15 credits required, 10 credits must be from the 10 series)

- 10D, 2D Foundation
- 10E, 3D Foundation
- 10F, 4D Foundation
- and one course from the Art 80 series.

Introduction to Contemporary Art Practice (15 credits required)

Student complete three courses from the following:

- 20G, Introduction to Print Media and Drawing
- 20H, Introduction to Sculpture and Public Art
- 20I, Introduction to Photography
- 20J, Introduction to Drawing and Painting
- 20K, Introduction to Digital Media

### Critical Theory and Historical Context (10 credits required)

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.

Note: Students may use Advanced Placement (AP) in Art History in lieu of the Western-emphasis history of art and visual culture requirement.

### UPPER-DIVISION REQUIREMENTS

Students complete eight courses as follows:

Studio Work (35 credits required)

- Seven upper-division (100+ numbered) studio courses (of which Art 190B may be one);

### Senior Capstone/Comprehensive Requirement

- 190A, Writing for Artists (meets the Disciplinary Communication requirement for the Art B.A.); and
- One of the following options:
  1. Completing Art 190B: Senior Project; or
  2. Presenting an exhibition and, by appointment, meeting with a faculty member for review and critique of the exhibition; or
  3. Submitting a portfolio and, by appointment, meeting with a faculty member for review and critique of the portfolio.

Senior majors should meet with their faculty adviser about this requirement.

A total of 80 credits are required for the Art B.A.; students are advised to plan in advance if they are interested in the program. Some requisite courses may be offered during Summer Session.

The last three quarters of coursework for the major must be completed in residence at UCSC.

## ART MAJOR PLANNER (INCOMING FROSH)

The following is a recommended academic plan for students to complete during their first two years as preparation for the art major.

Year	Fall	Winter	Spring
1st (frsh)	ART 80 Series†	ART 10 series**	ART 10 series**
	ART 10 series**		
2nd (soph)	ART 20 Series	ART 20 Series	ART 20 Series
	HAVC*	HAVC*	

†ART 80 courses may be taken in Fall, Winter, or Spring (one required)

\*Courses from history of art and visual culture (one with a Western emphasis, one with a non-Western emphasis)

\*\*Art 10 courses may be taken in fall, winter, and/or spring (two required)

## LOWER-DIVISION REQUIREMENTS (JUNIOR TRANSFERS)

- Three lower-division studios (equivalent to those found in the above list) should be taken at the community college, college, or university in preparation for the mandatory portfolio review prior to acceptance to the art major. Please remember that three studios is a minimum

## Art

requirement and may not be enough studio work undertaken to pass the highly competitive nature of the portfolio review.

- Two courses from history of art and visual culture may be taken at the community college, college, or university, if available, or at UCSC (one with a Western emphasis, one with a non-Western emphasis).

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### UPPER-DIVISION REQUIREMENTS (JUNIOR TRANSFERS)

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Students complete eight courses as follows (40 credits required):

- Art 194, Forms and Ideas;
- Six upper-division (100+ numbered) studio courses (one of which may be Art 190B, Senior Project)
- Art 190A, Writing for Artists

The last three quarters of coursework for the major must be completed in residence at UCSC.

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### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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- 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

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### COMPREHENSIVE REQUIREMENT

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- All art majors satisfy the capstone/comprehensive requirement with 190A, Writing for Artists; and

- One of the following options:

1. Completing Art 190B: Senior Project; or
2. Presenting an exhibition and, by appointment, meeting with a faculty member for review and critique of the exhibition; or
3. Submitting a portfolio and, by appointment, meeting with a faculty member for review and critique of the portfolio.

Senior majors should meet with their faculty adviser about this requirement.

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### STUDY ABROAD

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The UC Education Abroad Program (EAP) offers students the opportunity for study abroad. Art majors may participate in EAP in their junior year. Art students may not go abroad in their senior year because the last three quarters of coursework must be in residence at UCSC. 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 B or better.

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### MATERIALS FEE

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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 \$5 to \$150 per course. Students may incur additional expense purchasing individual supplies.

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## ART FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**Patrick Aherne, Emeritus**

**Joyce Brodsky, Emerita**

**Doyle Foreman, Emeritus**

**Frank Galuszka, Emeritus**

**Fred A. Hunnicutt, Emeritus**

**Jimin Lee**

Etching, lithography, monoprinting, book arts, ukiyo-e

**Norman Locks**

Photography

**Douglas E. McClellan, Emeritus**

**Jennie Lind McDade, Emerita**

**Kathryn E. Metz, Emerita**

**A. Laurie Palmer**

Sculpture, installation, public projects, writing

**Jasper A. Rose, Emeritus**

**Elizabeth Stephens**

Intermedia, electronic art, sculpture, and performance art

**Lewis Watts, Emeritus**

**Donald L. Weygandt, Emeritus**

**David Yager**

Photography, design, print media

**Jack Zajac, Emeritus**

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### ASSOCIATE PROFESSOR

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**Elliot Anderson**

Electronic art, digital arts/new media

**Melissa Gwyn**

Painting, drawing

**Dee Hibbert-Jones**

Public art, sculpture

**Robin Hunicke**

Game design

**Kate O’Riordan**

Theory, digital media technologies.

**Jennifer Parker**

Sculpture, digital art and new media, art | science

ASSISTANT PROFESSOR

**Enrique Leal**

Silkscreen, photogravure, intaglio, digital printmaking

LECTURER

**Peter Loftus**

Painting

**Kathleen Perry**

Intermedia, photography, sculpture

ART COURSES

LOWER-DIVISION COURSES

**10. Foundation Series in Art.**

Introduces general education students and prospective majors to theory and practice of art and contemporary discourse surrounding it. Courses expose students to both art discourse and art making through large lecture sections that meet twice a week and smaller studio sections that meet twice a week. Students must register for both lecture and studio sections. The Staff

**10D. 2D Foundation. W**

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. Students are billed for a materials fee. (General Education Code(s): IM.) E. Martinez Leal

**10E. 3D Foundation. F**

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. Students are billed

for a materials fee. (General Education Code(s): IM.) K. Perry, W. Hibbert-Jones

**10F. 4D Foundation. S**

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. (General Education Code(s): IM.) T. Bouscaren

**20. Introduction to Contemporary Art.**

Introduces basic conceptual and practical tools for specific art practices. Instruction consists of studio sections that meet twice a week incorporating theory, practice, technique, and critiques. The Staff

**20G. Introduction to Print Media and Drawing. F,S**

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. Students are billed for a materials fee. Prerequisite(s): Pre-art, proposed art, or art major, and completion of two courses from 10A, 10B, 10D, 10E, or 10F.

(General Education Code(s): PR-C.) E. Martinez Leal, J. Lee

**20H. Introduction to Sculpture and Public Art. W,S**

Introduces sculpture and art in public space. The course is composed of lectures, readings, discussions, studio assignments, and demonstrations. Students are billed for a materials fee. Prerequisite(s): Pre-art, proposed art, or art major, and completion of two courses from 10A, 10B, 10D, 10E, or 10F. (General Education Code(s): PR-C.) W. Hibbert-Jones, A. Palmer

**20I. Introduction to Photography. F,W,S**

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. Students are billed for a materials fee. (Formerly Introduction to Photography and Digital Media.) Prerequisite(s): Pre-art, proposed art, or art major, and completion of two courses from 10A, 10B, 10D, 10E, or 10F. (General Education Code(s): PR-C.) N. Locks, K. Perry

**20J. Introduction to Drawing and Painting. F,W,S**

Introduces the material practices of 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. Students are billed for a materials fee.

Prerequisite(s): Pre-art, proposed art, or art major, and completion of two courses from 10A, 10B, 10D, 10E, or 10F. (General Education Code(s): PR-C.) J. Hemming, M. Gwyn

**20K. Introduction to New Media and Digital Artmaking. F**

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. Students are billed for a material fee. Prerequisite(s): Pre-art, proposed art, or art major, and completion of two courses from 10A, 10B, 10D, 10E, or 10F. (General Education Code(s): PR-C.) E. Anderson

**42. Student-Directed Seminar. \*** Seminars taught by upper-division students under faculty supervision. Does not fulfill major requirement. (See course 192.) The Staff

**80. Artists and Ideas.**

Introduces general education students, prospective majors, and art majors to art forms and critical ideas that have shaped artistic practice focusing on the work of contemporary artists, including current faculty in the Art Department. The Staff

**80B. Environmental Art. W**

Examines ways artists engage, interact, and comment upon ecology and nature in their artworks by examining environmental art from the 1960s through the present. (General Education Code(s): PE-E.) E. Stephens

**80D. Introduction to Photography. S**

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. Students are billed a materials fee. (General Education Code(s): IM, T4-Humanities and Arts, A.) K. Perry

**80E. Tangible Memory: Artists in the Archive. S**

Students learn about how artists and museums keep historical memory alive. Instructor E.G. Crichton introduces her project--LINEAGE: Matchmaking in the Archive--in relation to other artworks that engage with archives. (General Education Code(s): IM, T4-Humanities and Arts, A.) E. Crichton

**80F. Introduction to Issues in Digital Media. F**

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. (General Education Code(s): ER, T6-Natural Sciences or Humanities and Arts, A.) K. McKinley

**99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**Upper-Division Courses**

**101. Introduction to Computer Programming for the Arts. S**

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. (General Education Code(s): MF.) The Staff

**102. Interactive Arts. S**

Physical computing examines bodily sound, movement, and other physical phenomena as an interface to a computer or microcomputer. Students investigate electronics and devices for use in interactive art-making to create sculptural or installation-based projects. Students receive hands-on experience working with sensors, motors, switches, gears, lights, circuits, and hardware store devices to create kinetic and interactive works of art, programming and interface design. Students are billed a materials fee. Prerequisite(s): Art 20B, 20I, 20K, 21, 103, 104, 107, or 108 or CMPS 25 or CMPM 25; and

## Art

two courses from any non-computer/digital media lower-division art studios (Art 15-40) or by permission of instructor. Restricted to art majors. May be repeated for credit. E. Anderson, The Staff

### **103. Interactive Art: Object, Interface, Robotics. \***

Examines computer interactivity and interface in art making through theory and practice. Students develop interactive installation and sculptural works of art. Assignments may include the acquisition and creation of digital images, two-dimensional animation, programming with MAX/MSP/Jitter, basic electronics and sensors, and digital video and audio. Discussions, readings, and critiques address content, aesthetics, concepts, and expression as well as a practical grasp of relevant software. Students are encouraged to develop research projects and explore experimental practices. Students are billed a materials fee. Prerequisite(s): Art 20B, 20I, 21, 22, 102, 104, 107, or 108 or CMPS 25 or CMPM 25; and two courses from any non-computer/digital media lower-division art studios (Art 15-40) or by permission of instructor. Restricted to art majors. May be repeated for credit. E. Anderson

### **104. Digital Video. W**

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. Prerequisites: Art

20B, 20I, 20K, 21, 22, 102, 103, 107, or 108 or CMPS 25, or CMPM 25; and two courses from any non-computer/digital media lower-division art studios (Art 15-40) or by permission of instructor. Restricted to art majors. May be repeated for credit. T. Bouscaren, E. Anderson

### **106. Introduction to Animation. F**

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. Prerequisite(s): Three courses from the following: Art 15-40 or CMPS 25 or CMPM 25. Enrollment restricted to art majors. May be repeated for credit. S. Ruiz, The Staff

### **107. Introduction to 3D Graphics and Modeling. W**

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. Students are billed for a materials fee.

Prerequisite(s): Art 20B, 20I, 20K, 21, 22, 102, 103, 104, or 108 or CMPS 25 or CMPM 25; and any two of any non-computer/digital media lower-division art studios (Art 15-40) or by permission of instructor. Restricted to art majors. May be repeated for credit. E. Anderson

### **108. New Media and Social Practice Artmaking. F**

Provides students with firsthand experience developing new media artworks in relationship to the needs of specific communities and social struggles. Students develop content using new media practices, tools, systems, and strategies. The final artwork can utilize video, film, digital media, social networks, and app development, among other new media art forms. Students are billed for a materials fee. Prerequisite(s): Art 20B, 20I, 20K, 21, 22, 102, 103, 104, or 107 or CMPS 25 or CMPM 25; and two courses from lower-division art studios courses (Art 15-40) or by permission of instructor. Enrollment restricted to art majors. May be repeated for credit. E. Anderson

### **110. Intermediate/Advanced Drawing. \***

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. Students are billed a materials fee. Prerequisite(s): Art 15, 20, 20A, 20G, 20J, 111, 112, 119; and two non-drawing lower-division art studios (Art 20H, 20I, 20K, 21-40, or CMPS 25, or CMPM 25) or by permission of instructor. Enrollment restricted to art majors. May be repeated for credit. M. Gwyn

### **111. Figure Drawing. F**

Focuses on drawing from the human figure and exploring the figure for the purpose of personal expression and social

## Art

communication. Intended for the intermediate/advanced drawing student. Students are billed a materials fee. Prerequisite(s): Art 15, 20, 20A, 20G, 20J, 110, 112, 119; and two non-drawing lower-division art studios (Art 20H, 20I, 20K, 21-40, or CMPS 25, or CPM 25) or by permission of instructor. Enrollment restricted to art majors. May be repeated for credit. N. Buchanan, The Staff

### **112. Mixed Media Works on Paper. \***

This course stresses alternative drawing processes, techniques, and materials. Intended for the intermediate or advanced student. Students are billed a materials fee. Prerequisite(s): Art 15, 20, 20A, 20G, 20J, 110, 111, or 119; and two of any non-drawing lower-division art studios (Art 20H, 20I, 20K, 21-40, or CMPS 25, or CPM 25) or by permission of instructor. Enrollment restricted to art majors. May be repeated for credit. M. Gwyn

### **118. Digital Drawing/Painting for Game Design. W,S**

Supports students working as artists in an interdisciplinary collaboration with project teams led by senior students in computer game design (the yearlong Computer Science 170 series). Instruction includes techniques, tools, and concepts of drawing and painting in a digital environment oriented toward the context of computer games. Coursework is composed of projects to develop individual ideas and skills, as well as offering productively engaged participation in a collaborative game-design team. Students are billed a materials fee. Enrollment restricted to art majors; admission by permission of the instructor. May be repeated for credit. The Staff

### **119. Special Topics in Drawing.**

### **F,W**

Special topics in drawing as announced. Students are billed a materials fee. Prerequisite(s): Art 15, 20, 20A, 20G, 20J, 110, 111, or 112; and two non-drawing lower-division art studios (Art 20H, 20I, 20K, 21-40, and CMPS 25 or CPM 25) or by permission of instructor. Enrollment restricted to art majors. May be repeated for credit. The Staff, T. Bouscaren, M. Gwyn

### **120. Introduction to Intermedia. F**

Explorations of the role of an artist as someone who integrates a variety of media to explore conscious subject matter. Emphasis on contemporary art forms that incorporate scores, mapping, found objects, time-based elements, and interactivity. Students are billed a materials fee. Prerequisites: Art 20D, 20H, 23, 28, 29, 37, 40, 121, 122, 124, 125, 129, 172, 180B, 183, 188, or 189; and two non-sculpture/intermedia public art lower-division studios (Art 15-38 or CMPS 25, or CPM 25). Restricted to art majors. E. Stephens

### **121. Intermedia II. \***

Investigation in combining media, materials, and forms to explore a variety of contemporary art practices. Students develop their projects thematically throughout the quarter. Assignments encourage experimentation with time and motion, text and images, collaboration, installation, performance, and interactivity. Discussions, reading handouts, and critiques further the development of perceptual and conceptual skills. Skill workshops introduce new techniques. Students are billed a materials fee. Prerequisite(s): Art 120. Enrollment restricted to art majors. May be repeated for credit. (General Education Code(s): PR-C, A.) K. Perry

### **122. Intermedia: Conceptual and Process-Oriented Approaches. F**

Special subjects to be offered by regular staff or visiting artists as announced. Students are billed a materials fee. Prerequisites: Art 20D, 20H, 23, 28, 29, 37, 40, 120, 121, 124, 125, 129, 172, 180B, 183, 188, or 189; and two non-sculpture/intermedia public art lower-division studios (Art 15-38 or CMPS 25, or CPM 25). Restricted to art majors. May be repeated for credit. R. Hunicke, The Staff

### **124. Material Metaphor: Creating Meaning in Form. S**

Workshops introduce further investigation of materials and techniques. Students explore diverse methods of visual communication through a series of projects that require individual research and collaborative efforts. Students are encouraged to develop projects according to their motivation, expertise, and self-assessment. Emphasis placed on contemporary studio practices of installation, students will integrate a variety of materials and metaphor within the architectural and environmental space. Students are billed a materials fee. Prerequisites: Art 20D, 20H, 23, 28, 29, 37, 40, 120, 121, 122, 125, 129, 172, 180B, 183, 188, or 189; and two non-sculpture/intermedia public art lower-division studios (Art 15-38 or CMPS 25, or CPM 25). Restricted to art majors. May be repeated for credit. E. Stephens

**125. Environmental Art Studio. W**

Introduces students to environmental art and design through basic concepts, techniques, and studio practice. Students are billed for a materials fee.

Prerequisites: Art 20D, 20H, 23, 28, 29, 37, 40, 121, 122, 124, 129, 172, 180B, 183, 188, or 189; and two non-sculpture/intermedia public art lower-division studios (Art 15-38 or CMPS 25, or CMPM 25).

Restricted to art majors. May be repeated for credit. E. Stephens

**127. Architectural Design. \***

Introduction to the fundamentals of architectural design. To convey their concepts clearly, students are introduced to visual representation techniques, including orthographic projections and paraline drawing.

Students are also introduced to representation techniques of abstraction and perception, including diagramming and mapping. Students are billed a materials fee. Prerequisite(s): Art 20D, 20H, 23, 28, 29, 37, 40, 120, 121, 122, 124, 125, 172, 180B, 183, 188, or 189; and two non-sculpture/intermedia public art lower-division studios (Art 15-38 or CMPM 25 or CMPS 25).

Enrollment restricted to art majors. Enrollment limited to 25. May be repeated for credit. The Staff

**128. Picturing Identity: Document and Culture. \***

Studio addresses issues of race, gender, culture, personal identity, and visual representation. Examines ways ideas of identity are given visual form and communicated in fine arts and mass media. Students research ways traditionally underrepresented groups in society have been and are being represented in mass media; they then visually interpret that information in forms of visual artifacts. This process and

interpretation serve as springboard to examination of expanded ideas of identity, including personal and/or family culture and history, gender, and ethnicity. Encourages use of broad range of mediums available to construct visual representations of identity. Students are billed a materials fee. Prerequisite(s): Three courses from the following: Art 15-40 or CMPS 25 or CMPM 25.

Enrollment restricted to art majors. The Staff

**129. Special Topics in Intermedia. S**

Exploring interactive strategies for making art. Projects experiment with combining forms and mediums to engage an audience. Students are billed a materials fee. Prerequisites: Art 20D, 20H, 23, 28, 29, 37, 40, 120, 121, 122, 124, 125, 172, 180B, 183, 188, or 189; and two non-sculpture/intermedia public art lower-division studios (Art 15-38 or CMPS 25, or CMPM 25). Restricted to art majors. May be repeated for credit. E. Stephens

**130. Intermediate/Advanced Painting. F**

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. Students are billed a materials fee.

Prerequisite(s): Art 20E, 20J, 24, 24A, 24B, 133, 137, 138, or 139; and two of any non-painting lower-division studios (Art 15-40 or CMPS 25 or CMPM 25). Enrollment restricted to art majors. May be repeated for credit. M. Gwyn

**133. Abstract Painting. W**

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. Students are billed a materials fee. Prerequisite(s): Art 20E, 20J, 24, 24A, 24B, 130, 137, 138, or 139; and two of any non-painting lower-division studios (Art 15-40 or CMPS 25 or CMPM 25). Enrollment restricted to art majors. May be repeated for credit. F. Galuszka

**137. Outdoor Painter's Project. S**

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(s): Art 20E, 20J, 24, 24A, 24B, 130, 133, 138, or 139; and two of any non-painting lower-division studios (Art 15-40 or CMPS 25, or CMPM 25). Enrollment restricted to art majors. May be repeated for credit. P. Loftus, The Staff

**138. Facture and Meaning. S**

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. Students are billed for a materials fee.

Prerequisite(s): Art 20E, 20J, 24, 24A, 24B, 130, 133, 137, or 139; and two of any non-painting lower-division art studios (Art 15-40 or CMPS 25 or CMPM 25). Enrollment restricted to art majors. May be repeated for credit. M. Gwyn

## Art

**139. Special Topics in Painting. \***  
Special studies in painting as announced. A foundation in drawing is recommended. Students are billed a materials fee.  
Prerequisite(s): Art 20E, 20J, 24, 24A, 24B, 133, 137, or 138; and two of any non-painting lower-division studios (Art 15-40 or CMPS 25 or CPM 25). Enrollment restricted to art majors. May be repeated for credit. M. Gwyn, The Staff

**143T. Design Concept Development. W**  
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): Theater Arts 10; or two courses from ART 10D, 10E, and 10F. Enrollment is by permission of the instructor. Theater Arts 106 is recommended as preparation. (Also offered as Theater Arts 103. Students cannot receive credit for both courses.) B. Baron, The Staff

**146T. Digital Illustration. \***  
Introduces digital rendering techniques using the Adobe Creative Suite. Using Adobe Creative Suite, students solve design problems. Enrollment by permission of the instructor. Application form available from baron@ucsc.edu. (Also offered as Theater Arts 106. Students cannot receive credit for both courses.) Enrollment limited to 30. (General Education Code(s): A.) The Staff

**147T. Design Studio: Costume. \***  
Students learn advanced principles and theory of costume design, and apply these towards a large project

for theatrical/film production or for character design for animation and gaming. Students are billed a materials fee. (Also offered as Theater Arts 117. Students cannot receive credit for both courses.) Enrollment limited to 30. May be repeated for credit. (General Education Code(s): IM, A.) B. Baron

**149A. Contemporary Visual Media: Issues of Theory and Practice. \***  
Examines selected issues in critical theory relevant to contemporary visual practices through writing assignments and class discussions of core readings. Specifically, thematically explores the relationship between visual art and film aesthetics. Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to juniors and seniors. (General Education Code(s): W.) The Staff

**149B. Contemporary Visual Media: Issues of Theory and Practice. \***  
Examines selected issues in critical theory relevant to contemporary visual practices through writing assignments and class discussions of core readings. Specifically, focuses on the creative process: How do artists work and what informs their production?  
Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to juniors and seniors. (General Education Code(s): W.) The Staff

**150. Darkroom Practices. F**  
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. Students are billed a materials fee. Prerequisite(s): Art 20C, 20I, 30, 32, 151, 156, 157, 158, or 159; and two of any non-photo lower-division studios (Art 15-40 or CMPS 25 or CPM 25). Enrollment restricted to art majors. May be repeated for credit. N. Locks

**150C. Critical Issues in Contemporary Art. \***  
This writing-specific course is concerned with the role of the artist in society and offers a comprehensive overview of contemporary thought within the visual arts from an international perspective. Special emphasis placed on current trends and shifts in artistic production, theory, and criticism, and on art works that are artistically and intellectually inventive, as well as those that produce controversial and often challenging results. Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to junior and senior art majors. (General Education Code(s): W.) The Staff

**151. Digital Photography. F,W**  
Introduction to basic theories behind the digital production, manipulation, and output of photographic images. Through readings and production, students address major issues specific to working with images in an increasingly digital environment. Students are billed a materials fee. Prerequisite(s): Art 20C, 20I, 30, 32, 150, 156, 157, 158, or 159; and two of any non-photo lower-division studios (Art 15-40, or CMPS 25 or CPM 25). Enrollment restricted to art majors. May be repeated for credit. N. Locks, K. Perry

**156. Project Development in Photography. W**  
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. Students are billed a materials fee. Prerequisite(s): Art 150 or 151. Enrollment restricted to art majors. May be repeated for credit. N. Locks, The Staff

### **157. Advanced Digital Photography. \***

Further study the practice, theories, and criticisms of the digital production, manipulation, and output of photographic images. Major issues specific to the production of digital images will be addressed through readings and discussion, including techniques and theories drawn from a course reader and a textbook on advanced Photoshop skills. A final project is required. Students are billed a materials fee. Prerequisite(s): Art 151. Enrollment restricted to art majors. May be repeated for credit. N. Locks

### **158. Advanced Photography. S**

Students produce a portfolio of photographs, read historical and theoretical works, and study photographs and other art works. Students are billed a materials fee. Prerequisite(s): two courses from Art 150, 151, 156, 157, or 159. Enrollment restricted to art majors. May be repeated for credit. N. Locks

### **159. Special Topics in Photography. S**

Special studies in photography, concentrating on specific subject matter or media. Topics may include documentary photography, landscape, alternative processes, or mixed media. Students are billed a materials fee. Prerequisite(s): Art 150 or 151. Enrollment restricted to art majors. May be repeated for credit. N. Locks, L. Watts

### **160B. Mono/Mixed Media Printmaking. \***

Introduces the contemporary monotype, monoprint, and mixed media print processes facilitating a crossover between painting, drawing, and printmaking. Through lectures, demonstrations, and discussions on topics and class assignments, students will expand their creative possibilities in this exciting medium. Students are billed a materials fee. Prerequisites: Art 20C, 20F, 20G, 25, 26, 27, 33, 36, 38, 161B, 162A, 162B, 163A, 163B, 164A, 165, 168, or 169; and two non-print lower-division media studios (Art 15-40 or CMPS 25 or CMPM 25). Enrollment restricted to art majors. May be repeated for credit. J. Lee

### **161B. Relief/Mixed Media Printmaking. W**

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. Prerequisites: Art 20C, 20F, 20G, 25, 26, 27, 33, 36, 38, 160B, 162A, 162B, 163A, 163B, 164A, 165, or 168; and two non-print lower-division media studios (Art 15-40 or CMPS 25 or CMPM 25). Enrollment restricted to art majors. May be repeated for

credit. J. Lee, The Staff

### **162A. Intaglio I. F**

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(s): Art 20C, 20F, 20G, 25, 26, 27, 33, 36, 38, 160B, 161B, 162B, 163A, 163B, 164A, 165, 168, or 169; and two non-print media lower-division studios (Art 15-40 or CMPS 25 or CMPM 25). Enrollment restricted to art majors. May be repeated for credit. J. Lee

### **162B. Intaglio II. \***

This presentation of advanced intaglio techniques emphasizes a variety of multi-plate color printing and photo etching processes. The course concentrates on individual development in style and concept through the intaglio process. Students are billed a materials fee. Prerequisite(s): Art 162A. Enrollment restricted to art majors. May be repeated for credit. J. Lee

### **163A. Lithography I. F**

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. Students are billed a materials fee. Prerequisites: Art 20C, 20F, 20G, 25, 26, 27, 33, 36, 38, 160B, 161B, 162A, 162B, 163B, 164A, 165, 168, or 169; and two non-print lower-division media studios (Art 15-40 or CMPS 25 or

## Art

CMPM 25). Enrollment restricted to art majors. May be repeated for credit. E. Martinez Leal

### **163B. Lithography II. \***

Continuation of course 163A.

Introduction of tusche wash, aluminum plates, transfers, photolithography (computer interface), and multiple color techniques. Emphasis on experimentation, refinement of craft and approach, defining individual imagery, and expanding scale. Further investigation of the history of the medium and contemporary practice. Students are billed a materials fee. Prerequisite(s): Art 163A. Enrollment restricted to art majors. May be repeated for credit. E. Martinez Leal

### **165. Print Media in Visual Communication. S**

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. Students are billed a materials fee. Prerequisite(s): one of Art 160B, 161B, 162A, 162B, 163A, 163B, 164A, 168, or 169. Enrollment restricted to art majors. May be repeated for credit. J. Lee

### **166. Art of Bookmaking. \***

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. Students are billed a materials fee. Prerequisite(s): Three courses from the following: Art 15-40 or CMPS 25

or CMPM 25. Enrollment restricted to art majors. May be repeated for credit. The Staff

### **168. Photo-Based Printmaking. W**

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. Prerequisites: Art 20C, 20F, 20G, 25, 26, 27, 33, 36, 38, 160B, 161B, 162A, 162B, 163A, 163B, 164A, 165, or 169; and two non-print lower-division media studios (Art 15-40 or CMPS 25 or CMPM 25). Enrollment restricted to art majors. May be repeated for credit. J. Lee

### **169. Special Topics in Printmaking. S**

Special studies in printmaking, as announced. Students are billed for a materials fee. Prerequisites: Art 20C, 20F, 20G, 25, 26, 27, 33, 36, 38, 160B, 161B, 162A, 162B, 163A, 163B, 164A, 165, or 168; and two non-print lower-division media studios (Art 15-40 or CMPS 25 or CMPM 25). Enrollment restricted to art majors. May be repeated for credit. E. Martinez Leal

### **172. Public Art: Memory, Landscape, and Artist as Activist. W**

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. Students are billed a materials fee. Prerequisites: Art 20D, 20H, 23, 28, 29, 37, 40, 120, 121, 122, 124, 125, 129, 180B, 183, 188, or 189; and two non-sculpture/intermedia public art lower-division studios (Art 15-38 or CMPS 25, or CMPM 25). Restricted to art majors. May be repeated for credit. W. Hibbert-Jones

### **180B. Sculpture II. S**

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. Students are billed a materials fee. Prerequisites: Art 20D, 20H, 23, 28, 29, 37, 40, 120, 121, 122, 124, 125, 129, 172, 183, 188, or 189; and two non-sculpture/intermedia public art lower-division studios (Art 15-38 or CMPS 25, or CMPM 25). Restricted to art majors. May be repeated for credit. A. Palmer

### **183. Metal Fabrication. W**

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

## Art

skills. Students are billed a materials fee. Prerequisites: Art 20D, 20H, 23, 28, 29, 37, 40, 120, 121, 122, 124, 125, 129, 172, 180B, 188, or 189; and two non-sculpture/intermedia public art lower-division studios (Art 15-38 or CMPS 25, or CMPM 25). Restricted to art majors. May be repeated for credit. K. McKinley, The Staff

### **188. Intermediate to Advanced Sculpture (Foundry). F,S**

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. Prerequisites: Art 20D, 20H, 23, 28, 29, 37, 40, 120, 121, 122, 124, 125, 129, 172, 180B, 183, or 189; and two non-sculpture/intermedia public art lower-division studios (Art 15-38 or CMPS 25, or CMPM 25). Restricted to art majors. May be repeated for credit. S. Monaghan, The Staff

### **189. Special Topics in Sculpture. W**

Special topics in sculpture as announced, concentrating on specific aspects of subject matter and media. Students are billed a materials fee. Prerequisites: Art 20D, 20H, 23, 28, 29, 37, 40, 120, 121, 122, 124, 125, 129, 172, 180B, 183, or 188; and two non-sculpture/intermedia public art lower-division studios (Art 15-38 or CMPS 25, or CMPM 25). Restricted to art majors. Offered in alternate academic years. May be repeated for credit. A. Palmer

### **190A. Writing for Artists. W**

Provides practice and discussion for art majors as they face a variety of situations requiring clear and critical writing skills: writing scholarly statements about their creative process; developing a concise artist biographical statement; drafting a short grant proposal for their projects; and preparing works of art for critique and exhibition. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to junior and senior art majors. (General Education Code(s): W.) T. Bouscaren

### **190B. Senior Project. S**

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. Students are billed for a materials fee. Enrollment restricted to senior art majors. W. Hibbert-Jones

### **191. Teaching Apprenticeship. F,W,S**

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. The Staff

### **192. Directed Student Teaching. F,W,S**

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. Enrollment limited to 5. The Staff

### **193. Field Study. F,W,S**

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. May be repeated for credit. The Staff

### **194. Forms and Ideas. F**

Required for all junior transfer student art majors. Introduction to the art program, emphasizing awareness of contemporary visual practices and theory. Combines studio practice and theory. Students are billed a materials fee. Enrollment restricted to junior transfer art majors. (General Education Code(s): A.) K. Perry, The Staff

### **196. Independent Senior Project. F,W,S**

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. (Formerly Senior Project.) May be repeated for credit. The Staff

Art

**197. Individual Study. F,W,S**

Individual study in areas approved by sponsoring instructors. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**198. Independent Field Study. F,W,S**

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. May be repeated for credit. The Staff

**199. Tutorial. F,W,S**

Individual study in areas approved by sponsoring instructors. Students submit petition to sponsoring agency. Students are billed a materials fee. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# ART AND DESIGN: GAMES AND PLAYABLE MEDIA

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2015-16 General Catalog

Elena Baskin Visual Arts Studios

Room E-104

(831) 459-2272

visart@ucsc.edu

<http://art.ucsc.edu>

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## PROGRAM DESCRIPTION

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The art and design: games and playable media (GPM) bachelor of arts (B.A.) degree at UCSC 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 existing computer science: computer game design (CGD) bachelor of science (B.S.), which focuses particularly on the technical materials. The new 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 GPM major will 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 GPM B.A. in the Arts Division ensures that students have needed programming skills, but 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.

While pursuing coursework in the major, all students are 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.

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### QUALIFICATION POLICY FOR THE ART AND DESIGN: GAMES AND PLAYABLE MEDIA MAJOR—FROSH

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Prior to declaring the games and playable media major, students must complete ARTG 80H (History of Digital Games), ARTG 80I (Foundations of Play), CMPM 80K (Foundations of Video Game Design), and CMPS 12B/M (Introduction to Data Structures/Laboratory). Students need to complete the lower-division courses early in their studies so that the petition to major status is accomplished by the end of their sophomore year.

Students receiving an NP, D, or F in one of the courses required for admission to the major may only declare once they have passed the same or equivalent course with a grade of C or better. Students who receive more than one grade of NP, D, or F among the four courses listed above can only declare the major through the portfolio appeal process.

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### MAJOR QUALIFICATION BY PORTFOLIO APPEAL

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The program faculty will conduct a quarterly review of portfolios for students who have passed the classes required for declaration, and wish to enter the major, but have not met the requirement with a grade of C or better across all classes.\* Within 15 days of this review, the faculty will notify the students, the Arts Division, college and Office of the Registrar of the decision.

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### PROGRAM LEARNING OUTCOMES

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Students who earn a B.A. in arts design: games and playable media will gain the skills, knowledge, and understanding that will enable them to:

**Program Learning Outcome (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.

Examples: Choosing very responsive hardware (e.g., mouse, not Kinect) for an experience meant to give players a feeling of detailed control. Choosing a simulation game system (not an action game system) for a game meant to address issues of deforestation.

**PLO 2:** Demonstrate ability to define, develop, and communicate artistically innovative game ideas—situated historically and employing the methods of multiple art practices.

Examples: Using storyboards or prototypes to describe a new type of in-game communication between players, intended to model and provide opportunities to reflect upon types of physical communication used under circumstances of surveillance, and compared with previous innovative uses of communication between players (e.g., Journey). Describing how the final game would use visual, musical, and voice-over narrative approaches to situate and reinforce the experience created through the communication and game systems.

**PLO 3:** Demonstrate 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.

Examples: Considering appropriate algorithmic approaches to achieving a behavior for a game. Understanding the abstractions involved in representing information about a game so that it can be effectively manipulated by the system during play.

**PLO 4:** Demonstrate 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.

Examples: Making a strong argument about how Braid does and doesn't break with the mechanics and gender representation conventions of previous generations of platforming games. Making a strong argument about how Twine games and the Twine authoring community both recapitulate and break from earlier hypertext authoring arguments and movements.

**PLO 5:** Demonstrate ability to collaboratively plan, organize, and execute complex, team-oriented projects, using appropriate communication and coordination techniques.

Examples: Realistic goal and task breakdown in post-greenlight planning process in Art and Design: Games 170. Effectively using Scrum and other communication techniques in Art and Design: Games 171.

**PLO 6:** Demonstrate ability to effectively use techniques for understanding how players experience a game system, and to compare this with project's artistic goals—then successfully iterate and revise project shape, scope, and function based on external feedback and personal/team constraints.

Examples: Using techniques from playtesting, human-computer interaction, and studio critique to understand what is and isn't working about an in-process game, then finding realistic ways to guide next steps that will be more likely to achieve project's artistic goals or discover compelling new directions.

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## REQUIREMENTS OF THE MAJOR

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The GPM major requires eight lower-division and 13 upper-division courses in residence and satisfaction of the senior comprehensive requirement.

Course requirements are divided into six conceptual areas and may not be credited in more than one area.

### 1. Games and Playable Media Foundations

Complete all of the following courses:

ARTG 80I, Foundations of Play (PE-H—Perspectives: Environmental Awareness)

ARTG 80H, History of Digital Games (PE-T—Perspectives: Technology and Society)

FILM 80V, Video Games as Visual Culture (PE-T)

### 2. Computational Foundations

Complete all of the following courses:

CMPS 5J, Introduction to Programming in Java (MF—Mathematical and Formal Reasoning)

CMPS 11, Intermediate Programming (MF)

CMPS 12B/M, Introduction to Data Structures/Laboratory (MF)

### 3. Game Design

Complete all of the following courses:

CMPM 80K, Foundations of Video Game Design (IM—Interpreting Arts and Media)

CMPM 120, Game Development Experience (PR-E—Practice: Collaborative Endeavor)

ARTG 120, Game Design Experience (PR-E)

ARTG 170, Game Design Studio I (DC)

ARTG 171, Game Design Studio II (7 credits)

ARTG 172, Game Design Studio III (7 credits)

## Art and Design: Games and Playable Media

### 4. Media Creation

Complete three courses from the following:

#### Art

ART 101, Introduction to Computer Programming for the Arts

ART 102, Interactive Arts

ART 103, Physical Computing: Installation and Sculpture

ART 104, Digital Video

ART 106, Introduction to Animation

ART 107, Introduction to 3D Graphics and Modeling

ART 108, New Media and Social Practice Artmaking

ART 118, Digital Drawing and Painting for Game Design (may be repeated for credit)

#### Digital Arts and New Media

DANM 100A, Animation I (PR-C—Practice: Creative Process)

DANM 100B, Animation II (PR-C)

DANM 132, Literary Games: The Intersection of Writing and Play (PR-C)

DANM 133, Introduction to Electronics and Physical Computing (PR-C)

DANM 134, Hacking for Artists: Experimenting with Digital Media (PR-C)

DANM 135, Kinematics: Motion and Machine Art (PE-T)

DANM 140, Introduction to 3D Printing, Laser-cutting and More (PR-C, also offered as Art 105)

DANM 143, Projects in Ecological Art (PE-H)

#### Film and Digital Media

FILM 150, Screenwriting (PR-C)

FILM 170A, Introduction to Digital Media Production (PR-C)

FILM 170B, Fundamentals of Film and Video Production (PR-C)

FILM 171A, Sound

FILM 171C, Found Footage (PR-C)

FILM 171D, Social Information Spaces

FILM 171G, Documentary Animation Workshop

FILM 172, Narrative Video Workshop

FILM 173, Narrative Digital Media Workshop

FILM 175, Documentary Video Workshop

FILM 176, Experimental Video Workshop

FILM 177, Digital Media Workshop, Computer as Medium

FILM 189, Advanced Topics in Digital and Electronic Media Spaces

#### Music

MUSC 123, Electronic Sound Synthesis

MUSC 124, Intermediate Electronic Sound Synthesis

MUSC 125, Advanced Electronic Sound Synthesis

MUSC 167, Workshop in Electronic Music

#### Theater Arts

THEA 104, Multimedia Authoring

THEA 106, Digital Illustration

THEA 114, Design Studio: Sound (PR-C)

THEA 157, Playwriting

THEA 159, Advanced Playwriting

### 5. Game Design/Human-Computer Interaction

Complete four of the following:

#### Computer Engineering

CMPE 131, Human-Computer Interaction

#### Computational Media

CMPM 146, Game AI

CMPM 148, Interactive Storytelling

CMPM 177, Creative Strategies for Designing Interactive Media

CMPM 178, Human-Centered Design Research (PR-C)

CMPM 179, Game Design Practicum (PR-C, also offered as ART 179)

#### Computer Science

CMPS 121, Mobile Applications

CMPS 183, Hypermedia and the Web

#### Psychology

PSYC 128, Human Factors

### 6. Arts Electives

Complete one History of Art and Visual Culture course from the following:

HAVC 141A, Modern Art: Realism to Cubism (IM)

HAVC 141B, Modern Art: Cubism to Pop (IM)

HAVC 141C, Modern Art: Pop to Present (IM)

Complete one lower-division studio course from the following:

#### Art

ART 10D, 2D Foundation (IM)

ART 10E, 3D Foundation (IM)

ART 10F, 4D Foundation (IM)

ART 20G, Introduction to Print Media and Drawing (PR-C)

ART 20H, Introduction to Sculpture and Public Art (PR-C)

## Art and Design: Games and Playable Media

ART 20I, Introduction to Photography (PR-C)  
ART 20J, Introduction to Drawing and Painting (PR-C)  
ART 20K, Introduction to Digital Media (PR-C)  
ART 80G, Visual Communication and Interaction Design (IM)

### Digital Arts and New Media

DANM 30, Workshop in Computer Music  
DANM 32, Internet Authorship for the Non-Programmer (PR-C)

### Music

MUSC 1C, University Concert Choir (PR-E)  
MUSC 2, University Orchestra (PR-E)  
MUSC 3, Large Jazz Ensemble  
MUSC 5A, West Javanese Gamelan Ensemble: Beginning  
MUSC 5B, West Javanese Gamelan Ensemble: Intermediate  
MUSC 5C, West Javanese Gamelan Ensemble: Advanced  
MUSC 8, Balinese Gamelan Ensemble  
MUSC 9, Wind Ensemble (PR-C)  
MUSC 10, Eurasian Ensemble (PR-C)

### Theater Arts

THEA 14, Drawing (PR-C)  
THEA 15, Special Topics in Textiles (PR-C)  
THEA 17, Costume Construction (PR-C)  
THEA 18, Drafting for Theatrical Production  
THEA 19, Design Studio: Lighting Studio A (PR-C)  
THEA 20, Introductory Studies in Acting (IM)  
THEA 21A, Acting Studio IA: Psychological Realism  
THEA 21B, Acting Studio IB: Actors' Physicality  
THEA 22, Indonesian Dance and Drama (CC—Cross Cultural)  
THEA 30, Introduction to Dance Theory and Technique (PR-C)  
THEA 31C, The Dance Experience (PR-C)  
THEA 33C, Dance Studio I

THEA 36, Introduction to Dance CompositionThe art and design: games and playable media (GPM) bachelor of arts (B.A.) degree at UCSC 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 existing computer science: computer game design (CGD) bachelor of science (B.S.), which focuses particularly on the technical materials. The new 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 GPM major will 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 GPM B.A. in the Arts Division ensures that students have needed programming skills, but 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.

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, CPM 80K, and ARTG 120, and CPM 120.

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## DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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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.

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## COMPREHENSIVE REQUIREMENT

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Students satisfy the senior comprehensive requirement by receiving a passing grade in all three courses of the game design studio sequence (ARTG 170, 171, and 172). This sequence will meet in collaboration with CPM 170, 171, and 172.

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**ART AND DESIGN: GAMES AND PLAYABLE MEDIA MAJOR PLANNER**

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The following is a recommended academic plan for students to complete during their first two years as preparation for the GPM major.

**Art and Design: Games and Playable Media B.A.**

	<b>Fall</b>	<b>Winter</b>	<b>Spring</b>	<b>Summer</b>
<b>Year One Frosh</b>	<b>ARTG 80I</b> , Foundations of Play (PE-H)	<b>CMPS 5J</b> , Introduction to Programming: Java (MF)	<b>CMPS 11</b> , Intermediate Programming (MF)	
	College Core (C1)	<b>CMPM 80K</b> , Foundations of Video Game Design (IM)		
	<b>^MATH 3</b> , Precalculus (MF); or Elective	College Core (C1)	General Ed (SI—Scientific Inquiry)	
<b>Year Two Sophomore</b>	<b>CMPS 12B/M</b> , Data Structures/Lab (MF)	<b>FILM 80V</b> , Video Games as Visual Culture (PE-T)	<b>*CMPM 120</b> , Game Development Experience (PR-E)	<b>*CMPM 120</b> , Game Development Experience (PR-E)
	<b>** ARTG 80G</b> , Visual Communication & Interaction Design (IM)	General Ed (C2)	<b>*ARTG 120</b> , Game Design Experience (PR-E)	<b>*ARTG 120</b> , Game Design Experience (PR-E)
	<b>ART 80H</b> , History of Digital Games (PE-T)	Elective	General Ed (TA—Textual Analysis)	

^ The prerequisite for CMPS 11 can be satisfied in any of the following ways: successfully passing Math 3, Math 11A, Math 19A, Applied Math and Statistics 3, Applied Math and Statistics 11A, Economics 11A, or 400 or higher on the math placement exam.

\* ARTG 120 and CMPM 120 May be taken in spring or summer quarter (if offered in summer).

\*\*ARTG 80G, while not a requirement for the GPM BA, is recommended for providing useful knowledge for the major.

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## TRANSFER STUDENTS

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Junior transfer students are encouraged to complete all general education courses before coming to UCSC and are required to take programming courses outlined in articulation agreements and four introductory courses in the arts before coming to UCSC: 1) in contemporary art history or visual culture; 2) in visual communications; 3) in digital media creation; and 4) in visual, written or performing arts: drawing, photography, digital media, sculpture, painting, fiction, poetry, dramatic writing, theater, dance or music. Students must apply to the program in April of the year before coming to UCSC. The mechanism for acceptance to the degree program is to develop a comprehensive proposal packet including an application form, a portfolio, unofficial transcript(s), and an artist's statement, with optional letters of recommendation. We do not admit junior transfers mid-year; students must enter in fall of their junior year.

Because of the number of credits required in the B.A., it may take junior transfers longer to complete all major requirements; however, summer session courses and/or additional courses over the academic year may

allow a student who does not have recommended courses upon transfer to still graduate within two years. There are no foreign language requirements.

Transfer students are strongly advised to attend a UCSC Summer Orientation session for transfer students. Transfer students must consult with an art department academic adviser prior to enrolling in classes to determine their status and to begin the declaration of major process as soon as possible.

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### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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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.

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### COMPREHENSIVE REQUIREMENT

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Students satisfy the senior comprehensive requirement by receiving a passing grade in all three courses of the game design studio sequence (ARTG 170, 171, and 172). This sequence will meet in collaboration with CPM 170, 171, and 172.

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## ART AND DESIGN: GAMES AND PLAYABLE MEDIA COURSES

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### LOWER-DIVISION COURSES

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#### **80G. Visual Communication and Interaction Design. S**

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. (General Education Code(s): IM.) R. Hunicke, The Staff

#### **80H. History of Digital Games. W**

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 Art 80H.) (General Education Code(s): PE-T.) H. Lowood, The Staff

#### **80I. Foundations of Play. F**

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. (Formerly Art 80I.) (General Education Code(s): PE-H.) R. Hunicke

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### UPPER-DIVISION COURSES

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#### **120. Game Design Experience. S**

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(s): courses 80H or 80I; and Computer Science 12B and 12M and

Computational Media 80K and Film and Digital Media 80V. Concurrent enrollment in Computational Media 120 is required. (General Education Code(s): PR-E.) R. Hunicke

#### **145. Non-Digital Game Design. \***

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. R. Hunicke

#### **170. Game Design Studio I. \***

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(s):

## Art and Design: Games and Playable Media

satisfaction of the Entry Level Writing and Composition requirements; course 120; and one course from the game design/human-computer interaction electives. Enrollment restricted to senior art and design: games and playable media majors. R. Hunicke

### **171. Game Design Studio II. \***

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(s): course 170, and two courses from the game design/human-computer interaction electives, and one course from the media creation electives. Enrollment restricted to senior art and design: games and playable media majors. R. Hunicke

### **172. Game Design Studio III. \***

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(s): course 171, and three courses from the game design/human-computer interaction electives, and two

courses from the media creation electives. Enrollment restricted to senior art and design: games and playable media majors. R. Hunicke

### **179. Game Design Practicum. \***

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. (Also offered as Computational Media 179. Students cannot receive credit for both courses.) Prerequisite(s): Three courses from the following: Art 15-40 or Computational Media 25 or Computer Science 25. May be repeated for credit. (General Education Code(s): PR-C.) The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# ARTS DIVISION

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2015-16 General Catalog

Porter College, D Building,

(831) 459-4940

<http://arts.ucsc.edu>

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## PROGRAM DESCRIPTION

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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, and theorists working across the arts in a global context.

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.) in music. There are also several minors offered in film and digital media, history of art and visual culture, electronic music, jazz, 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 arts (M.A.), the music master of arts (M.A.), and the theater arts master of arts (M.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. A master of fine arts (M.F.A.) program in art (environmental art and social practice) is currently in review.

The Arts Division provides students with access to quality work spaces, including a new 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, 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 and faculty shows. Celebrating its 45<sup>th</sup> anniversary in 2016-17, the Sesnon Gallery presents curated exhibitions to the university community and the general public. The Institute for the Arts and Sciences, a focus for interdisciplinary creative work, exhibitions, conferences, symposia, and seminars, is currently in development.

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. An annual Dean's Lecture Series invites innovative leaders to present on selected topics of interest to the campus community. Student work is regularly broadcast on SCTV, and *Eyecandy*, a student-run magazine and blog, publishes student writing 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. 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.

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

Revised 09/01/15

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# ASTRONOMY AND ASTROPHYSICS

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2015-16 General Catalog

Porter College, D Building,

(831) 459-4940

<http://arts.ucsc.edu>

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## PROGRAM DESCRIPTION

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The science of astronomy 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, extrasolar planets, interstellar medium, intergalactic medium, solar system dynamics, and all aspects of observational optical and infrared astronomy. 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 Astronomy and Astrophysics Department offers a broad undergraduate curriculum that fulfills the needs of students seeking a general education but also enables students wishing to obtain a minor or major in astrophysics to study the subject in greater depth.

The graduate program is intended for those with a professional interest in the subject. The interests of the faculty embrace a wide range of both theoretical and observational aspects of astronomy. Current research and course offerings include our solar system and other planetary systems, stellar structure and evolution, stellar spectroscopy, the interstellar medium, galactic structure, active galaxies and quasars, cosmology, general relativity and 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.

The Center for Adaptive Optics (CfAO) is also headquartered at UCSC. Education is central to the CfAO's mission, and a key element of this is the support provided by the center to graduate students. In addition to research, the center provides interdisciplinary access to a nationwide network of scientists in astronomy and vision science.

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## UNDERGRADUATE COURSES

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Instruction in astronomy for undergraduates at UCSC is designed to meet the needs of several groups of students.

Courses 1, 2, 3, 4, 5, and 6, providing a general survey of the universe as now understood from historical and modern observations, are offered for those not specializing in a scientific discipline. Course 1 is a non-mathematical introduction to the Universe, while courses 2 through 6 provide an introduction, with the use of basic mathematics, to a diverse array of modern astronomy, from planets to the formation and evolution of the Universe.

Courses 12, 13, 15, 16, and 18, emphasizing basic physical laws and theories as applied to astronomy, taken together provide a survey of modern astronomy for students with some facility in mathematics. Taken separately, these courses provide an in-depth introduction to particular fields within astronomy. These courses are designed for students intending to major in a scientific subject, although qualified nonscience majors may enroll. A good high school background in mathematics and physics is required.

Prior or concurrent enrollment in a basic calculus course (Mathematics 11A or 19A) and a basic physics course (Physics 5A/L or 6A/L) is helpful but not required.

Finally, a more thorough quantitative treatment of selected topics in astronomy and astrophysics at the

## Astronomy and Astrophysics

upper-division level is provided by courses 111, 112, 113, 117, and 118. Completion of coursework in calculus of several variables (Mathematics 22 or 23A-B) and Physics 5B/M or 6B/M and 5D is required for these advanced courses. Course 119 is an introduction to modern scientific computing with a focus on astrophysics problems.

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### ASTROPHYSICS MINOR

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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. The minor in astronomy and astrophysics requires that students take the Physics 5 or 6 series (with associated laboratories), Physics 5D or Physics 102, a minimum of two courses from the Astronomy 12–18 series, and a minimum of three courses from the following, Astronomy 111–118, PHYS 129, PHYS 171, ASTR 257. A senior thesis on an astronomy-related topic is also encouraged. Interested students should contact the Physical & Biological Sciences Undergraduate Affairs office for further information.

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### ASTROPHYSICS MAJOR

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The UCSC major in astrophysics is administered by the Physics Department and combines a core physics major with advanced electives in astrophysics, an astrophysics laboratory course, and senior thesis work on a topic in astrophysics. It is a rigorous program designed to prepare students for a broad range of technical careers or for entry into graduate or professional programs. A full description of the major can be found in the physics section of this catalog.

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### PREPARATION FOR GRADUATE WORK IN ASTROPHYSICS

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The UCSC graduate program in astronomy and astrophysics is designed for Ph.D. students seeking a professional career in teaching and research. 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 UCSC include the following undergraduate courses:

**Basic physics.** Mechanics, wave motion, sound, light, electricity and magnetism, thermodynamics, atomic physics, and quantum mechanics (Physics 5A, 5B, and 5C).

**Basic mathematics.** Calculus (Mathematics 19A-B and 23A-B or equivalent) and statistics (Applied Mathematics and Statistics 5).

**Intermediate-level physics.** Mechanics (Physics 105); electricity, magnetism, and optics (Physics 110A-B); mathematical methods in physics (Physics 116A-B-C); nuclear and particle physics (Physics 129); and quantum mechanics (Physics 139A-B).

Intermediate-level mathematics. Linear algebra (Mathematics 21), complex analysis (Mathematics 103), and ordinary and partial differential equations (Mathematics 106 and 107).

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### GRADUATE PROGRAM

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Graduate instruction is built upon a two-year cycle of 11 one-quarter courses in astronomy and physics that are required of all students.

Seven courses are specifically required:

Astronomy 202, Radiative Processes

Astronomy 204, Astrophysical Flows

Astronomy 205, Introduction to Astronomical Research and Teaching

Astronomy 212, Dynamical Astronomy

Astronomy 220A, Stellar Structure and Evolution

Astronomy 230, Diffuse Matter in Space

Astronomy 233, Physical Cosmology

Four additional courses are chosen from the list of electives given below. In addition, students must fulfill the following requirements:

Students must meet at least quarterly with an assigned adviser.

Each student must also be a teaching assistant for at least two quarters.

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 independent study with a faculty member and give a department talk on that work.
- Pass a preliminary examination based on course material, relevant physics, and general astronomical knowledge.
- Submit one lead-author paper to a refereed journal that is based on research conducted at UCSC. 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

## Astronomy and Astrophysics

pursues option (2), he or she is 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, he or she will meet with his or her adviser, 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.

By the end of the third year, students must complete a qualifying examination that presents and defends a proposed thesis topic.

After passing the board review based on the above-mentioned requirements and the qualifying examination, students pursue independent research leading to the doctoral dissertation. 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.

The department has established five years as the normative time to degree. Normative times is the elapsed calendar time, in years, that, under normal circumstances, will be needed to complete all requirements for the Ph.D. 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.

Electives (four required) may be drawn from this list:

Astronomy 207, Future Directions/Future Missions  
Astronomy 214, Special Topics in Cosmology  
Astronomy 220B, Star Formation

Astronomy 220C, Advanced Stages of Stellar Evolution and Nucleosynthesis  
Astronomy 222, Planetary Formation and Evolution  
Astronomy 223, Planetary Physics  
Astronomy 225, High-Energy Astrophysics  
Astronomy 231, Diffuse Gas In and Between Galaxies  
Astronomy 235, Numerical Techniques  
Astronomy 237, Accretion Processes  
Astronomy 240A, Galactic and Extragalactic Stellar Systems  
Astronomy 240B, High Redshift Galaxies  
Astronomy 257, Modern Astronomical Techniques  
Astronomy 260, Instrumentation for Astronomy  
Astronomy 289, Adaptive Optics and Its Applications  
Physics/Astronomy 224, Particle Astrophysics and Cosmology  
Physics/Astronomy 226, General Relativity  
Earth and Planetary Sciences 262, Planetary Interiors  
Earth and Planetary Sciences 263, Planetary Surfaces  
Earth and Planetary Sciences 264, Planetary Atmospheres  
Earth and Planetary Sciences 265, Order of Magnitude Estimation  
Earth and Planetary Sciences 275, Magnetohydrodynamics  
Applied Mathematics and Statistics 206, Bayesian Statistics  
Applied Mathematics and Statistics 212A, Applied Mathematical Methods I  
Applied Mathematics and Statistics 213, Numerical Solution of Differential Equations  
Applied Mathematics and Statistics 214, Applied Dynamical Systems  
Applied Mathematics and Statistics 217, Introduction to Fluid Dynamics  
Physics 210, Classical Mechanics  
Physics 215, Introduction to Non-Relativistic Quantum Mechanics  
Physics 216, Advanced Topics in Non-Relativistic Quantum Mechanics  
Physics 217, Quantum Field Theory I  
Physics 218, Quantum Field Theory II  
Physics 227, Advanced Fluid Dynamics

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## ASTRONOMY AND ASTROPHYSICS FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR/ASTRONOMER

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**Peter H. Bodenheimer, Emeritus**

**Michael J. Bolte**

Dynamics of star clusters, ages of star clusters, chemical enrichment history of the galaxy, observations of interacting galaxies

**Jean P. Brodie**

Extragalactic globular clusters, galaxy formation, near-field cosmology

**Harland W. Epps, Emeritus**

**Sandra M. Faber, Emeritus**

Galaxies, stellar populations, cosmology, instrumentation

**Puragra (Raja) GuhaThakurta**

Galaxy formation and evolution: resolved stellar populations in the Local Group and distant galaxies. Globular clusters. Interstellar dust.

**Garth D. Illingworth**

High redshift galaxies, galaxy formation/evolution, science policy

**Burton F. Jones, Emeritus**

**David C. Koo, Emeritus**

**Robert P. Kraft, Emeritus**

**Claire Max**

Adaptive optics and high spatial resolution imaging, colliding galaxies, active galactic nuclei and their supermassive black holes

**Joseph S. Miller, Emeritus**

**Jerry E. Nelson, Emeritus**

**Jason Prochaska**

Damped Ly $\alpha$  systems in quasars, Lyman limit systems, stellar abundances, thick disk imaging of our galaxy

**David M. Rank, Emeritus**

**Constance Rockosi**

Galactic structure, stellar populations, CCD detectors, astronomical instrumentation

**Graeme H. Smith**

Stellar populations, chromospheric activity among late-type stars

**Steven S. Vogt**

Extrasolar planets, stellar, spectroscopy, instrumentation

**Merle F. Walker, Emeritus**

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### ASTRONOMER

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**Lloyd B. Robinson, Emeritus**

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### PROFESSOR

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**George R. Blumenthal**

Cosmology, galaxy formation, high-energy astrophysics

**Frank D. Drake, Emeritus**

**John Faulkner, Emeritus**

**Jonathan Fortney**

Planetary atmospheres and interiors, extrasolar planets

**Gregory Laughlin**

Extra-solar planets, numerical astrophysics

**Douglas N. C. Lin**

Fluid dynamics, star formation, galactic structure, planetary systems, accretion disks, extra-solar planets

**Piero Madau**

Cosmology, high-energy astrophysics

**Bruce H. Margon, Emeritus**

William G. Mathews, Emeritus Research Professor

**Enrico Ramirez-Ruiz**

Stellar explosions, gamma-ray bursts accretion physics, near compact stars

**Stanford E. Woosley**

Supernovae, stellar evolution, nucleosynthesis

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### ASSOCIATE PROFESSOR

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**Mark Krumholz**

Star formation, interstellar medium, numerical methods

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### LECTURER

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**Adriane Steinacker**

Planet formation, MHD simulations



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### PROFESSOR

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**Anthony N. Aguirre (Physics)**

Cosmology of the early and late universe: inflation and the global structure of cosmological models; the intergalactic medium and its enrichment with heavy elements; galaxy formation, evolution, and feedback processes; dark matter; theories of modified gravity

**Nic Brummel (Applied Mathematics and Statistics)**

Fluid dynamics; magnetohydrodynamics; numerical simulations of geophysical and astrophysical dynamics, especially solar interior physics; supercomputing

**Pascale Garaud (Applied Mathematics and Statistics)**

Astrophysics, geophysics, fluid dynamics, numerical resolutions of differential equations, and mathematical modeling of natural flows

**Gary Glatzmaier, Emeritus (Earth and Planetary Sciences)**

**Francis Nimmo (Earth and Planetary Sciences)**  
Icy satellites, accretion, Mars, planetary geophysics

**Joel R. Primack (Physics)**

Cosmology, galaxy, formation and evolution, particle astrophysics, nature of dark matter, gamma ray astronomy

**Steven Ritz (Physics)**

Particle physics and astrophysics

**David M. Smith (Physics)**

High-energy astrophysics; X-ray and gamma-ray detectors and instrumentation; solar, terrestrial, and planetary sources of gamma radiation

ASSOCIATE PROFESSOR

**Stefano Profumo (Physics)**

Theory of particle physics and particle astrophysics

ASSISTANT PROFESSOR

**Ian Garrick-Bethell, (Earth and Planetary Sciences)**

Planetary interiors, paleomagnetism

**Tesla Jeltema**

High-energy astrophysics and cosmology

RESEARCH ASTRONOMER

**Donald Gavel**

Development of next generation adaptive optics for large telescopes, Director of Laboratory for Adaptive Optics

**Brad Holden**

Design, development, and oversight of UC Astronomy Data Center (all data obtained by UC astronomers at the Lick and Keck Observatories), early evolution of elliptical galaxies

**Robert Kibrick**

Development of computer software and wide-area networks in support of remote control and data-acquisition systems for telescopes and complex astronomical instrumentation systems

**Terry Mast**

Development of large telescopes and their instrumentation

**Drew Phillips**

Extragalactic star-formation, gas-phase abundances, galaxy kinematics, and galaxy formation and evolutions; development of astronomical optics and instrumentation

**Richard Stover**

Development and construction of state-of-the-art detector systems for instruments at Lick Observatory and the Keck Observatory

ASTRONOMY AND ASTROPHYSICS COURSES

LOWER-DIVISION COURSES

**1. Introduction to the Cosmos. F,S**

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 and course 2. (General Education Code(s): SI, IN.) P. Guha Thakurta

**2. Overview of the Universe. F,W,S**

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. (General Education Code(s): MF, IN, Q.) C. Rockosi, S. Vogt

**3. Introductory Astronomy: Planetary Systems. F,W**

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. Courses 3, 4, and 5 are independent and may be

taken separately or sequentially. (Formerly Introductory Astronomy: The Solar System.) (General Education Code(s): MF, IN, Q.) D. Lin

**4. Introductory Astronomy: The Stars. \***

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. Courses 3, 4, and 5 are independent and may be taken separately or sequentially. (General Education Code(s): MF, IN, Q.) A. Steinacker

**5. Introductory Astronomy: The Formation and Evolution of the Universe. W,S**

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. Courses 3, 4, and 5 are independent and may be taken separately. (General Education Code(s): MF, IN, Q.) J. Brodie, M. Bolte

**6. The Space-Age Solar System. W**

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. (Formerly course 80A.) (General Education Code(s): SI, T-2 Natural Sciences.) G. Smith

**12. Stars and Stellar Evolution. F**

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 Mathematics 2 level required. (General Education Code(s): MF, IN, Q.) The Staff

**13. Galaxies, Cosmology, and High Energy Astrophysics. F**

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. (General Education Code(s): MF, IN, Q.) The Staff

**15. Dead Stars and Black Holes. \***

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. (General Education Code(s): MF, IN, Q.) E. Ramirez-Ruiz

**16. Astrobiology: Life in the Universe. \***

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. Enrollment limited to 50. (General Education Code(s): MF, IN, Q.) A. Steinacker

**18. Planets and Planetary Systems. W**

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 Mathematics 2 level required. Offered in alternate academic years. (General Education Code(s): IN, Q.) D. Lin

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**UPPER-DIVISION COURSES**

**111. Order-of-Magnitude Astrophysics. S**

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(s): Mathematics 22 or 23A; Physics 5B or 6B; and Physics 101A or Physics 102. Enrollment limited to 25. G. Laughlin

**112. Physics of Stars. W**

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(s): Mathematics 22 or 23A, Physics 5B or 6B, and Physics 101A or Physics 102 J. Fortney

**113. Introduction to Cosmology. W**

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. (Formerly "Physical Cosmology.") Prerequisite(s): Mathematics 22 or 23A, Physics 5B or 6B, and Physics 101A or 102. P. Madau

**117. High Energy Astrophysics. \***

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(s): Mathematics 22 or 23A, Physics 5B or 6B, and Physics 101A or Physics 102. E. Ramirez-Ruiz

**118. Physics of Planetary Systems. S**

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(s): Mathematics 22 or 23A, and Physics 5B or 6B. Offered in alternate academic years. J. Fortney

**119. Introduction to Scientific Computing. W**

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). (Also offered as Earth Sciences 119. Students cannot receive credit for both courses.) Prerequisite(s): Mathematics 11A or 19A or 20A or Applied Mathematics or Statistics 15A. (General Education Code(s): IN.) G. Laughlin

**135. Astrophysics Advanced Laboratory. \***

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: 135A in fall and 135B in winter, depending on astronomical conditions. (Also offered as Physics 135. Students cannot receive credit for both courses.) Prerequisite(s): Physics 133 and at least one astronomy course. Intended primarily for juniors and seniors majoring or minoring in astrophysics. G. Brown

**135A. Astrophysics Advanced Laboratory (3 credits). F**

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 135 in fall, depending on astronomical conditions. (Also offered as Physics 135A. Students cannot receive credit for both courses.) Prerequisite(s): Physics 133 and at least one astronomy course. G. Brown

**135B. Astrophysics Advanced Laboratory (2 credits). W**

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 135 in fall, depending on astronomical conditions. (Also offered as Physics 135B. Students cannot receive credit for both courses.) Prerequisite(s): Physics 133 and at least one astronomy course. G. Brown

**171. General Relativity, Black Holes, and Cosmology. F**

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. (Also offered as Physics 171. Students cannot receive credit for both courses.) Prerequisite(s): courses 105, 110A, 110B, and 116A-B. H. Haber

**199. Tutorial. F,W,S**

May be repeated for credit. The Staff

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**GRADUATE COURSES**

**202. Radiative Processes. F**

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 Electromagnetism and Plasma Physics.) Offered in alternate academic years. E. Ramirez-Ruiz

**204. Astrophysical Flows. W**

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 204A Physics of Astrophysics I and 204B Physics of Astrophysics II.) Enrollment restricted to graduate students. Offered in alternate academic years. G. Laughlin

**205. Introduction to Astronomical Research and Teaching. F**

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.) Enrollment restricted to graduate students. G. Smith

**207. Future Directions/Future Missions. S**

Examines possible key science goals for the next decade, such as planet detection, galaxy formation, and "dark energy" cosmology; the means for addressing these goals, such as new space missions and/or ground-based facilities; and the political, technical, and scientific constraints on such research. Looks at the role of the Decadel Survey. Examines a few existing programs (DEEP, ALMA, SNAP, NGST) as examples. Enrollment restricted to graduate students. Offered in alternate academic years. G. Illingworth

**212. Dynamical Astronomy. \***

Surveys dynamical processes in astrophysical systems on scales ranging from the planetary to the cosmological, stability and evolution of planetary orbits, scattering processes and the few-body problem, processes in stellar clusters, spiral structure and galactic dynamics, galactic collisions, and evolution of large-scale structure. Enrollment restricted to graduate students. G. Laughlin

**214. Special Topics in Galactic and Extragalactic Astronomy. \***

Survey of some principal areas of research on the origin and growth

of cosmic structures and galaxies: the "dark ages;" 21cm 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. (Formerly Special Topics in Cosmology) Enrollment restricted to graduate students. P. Madau

**220A. Stellar Structure and Evolution. F**

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. Enrollment restricted to graduate students. J. Fortney

**220B. Star Formation. F**

Theory and observations of star formation. Observational techniques used to study star formation, particularly millimeter line and continuum observations, and infrared, visible, and UV star-formation tracers. Physics of giant molecular clouds and galaxy-scale star formation. Gravitational instability, collapse, and fragmentation. Pre-main sequence stellar evolution. Protostellar accretion disks and jets. Radiative feedback and HII regions. (Formerly Star and Planet Formation) Prerequisite(s): course 220A. M. Krumholz

**220C. Advanced Stages of Stellar Evolution and Nucleosynthesis. S**

The evolution of massive stars beyond helium burning; properties of white dwarf stars; physics and

observations of novae, supernovae, and other high energy stellar phenomena; nuclear systematics and reaction rates; the origin and production of all the chemical elements. Prerequisite(s): course 220A. Enrollment restricted to graduate students. S. Woosley

**222. Planetary Formation and Evolution. \***

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 Science) Enrollment restricted to graduate students. Offered in alternate academic years. D. Lin

**223. Planetary Physics. \***

Survey of interiors, atmospheres, thermal evolution, and magnetospheres of planets, with focus on the astronomical perspective. Course covers exoplanets and solar system planets, both giant and terrestrial, with attention to current and future observations. Enrollment restricted to graduate students. J. Fortney

**224. Particle Astrophysics and Cosmology. S**

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

## Astronomy and Astrophysics

techniques. (Formerly Origin and Evolution of the Universe.) (Also offered as Physics 224. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. Offered in alternate academic years. A. Aguirre

**225. High-Energy Astrophysics. \*** 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) Offered in alternate academic years. E. Ramirez-Ruiz

**226. General Relativity. W** Develops the formalism of Einstein's general relativity, including solar system tests, gravitational waves, cosmology, and black holes. (Also offered as Physics 226. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. S. Profumo

**230. Diffuse Matter in Space. S** 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. (Formerly Low-Density Astrophysics) Offered in alternate academic years. The Staff

**231. Diffuse Gas In and In Between Galaxies. \*** Examines the observational data and theoretical concepts related to the interstellar medium (gas inside galaxies); intracluster medium (gas in between galaxies in clusters); and intergalactic medium (gas in between field galaxies). Emphases on the inferred physical conditions

of this gas and its implications for cosmology and processes of galaxy formation. Enrollment restricted to graduate students. J. Prochaska

**233. Physical Cosmology. \*** 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. Offered in alternate academic years. The Staff

**235. Numerical Techniques. \*** Gives students a theoretical and practical grounding in the use of numerical methods and simulations for solving astrophysical problems. Topics include N-body, SPH and grid-based hydro methods as well as stellar evolution and radiation transport techniques. Enrollment restricted to graduate students. Offered in alternate academic years. The Staff

**237. Accretion Processes. \*** Theories of spherical accretion, structure and stability of steady-state accretion disks, and the evolution of time-dependent accretion disks. Applications of these theories to the formation of the solar system as well as the structure and evolution of dwarf novae and X-ray sources are emphasized. (Formerly Accretion in Early and Late Stages of Stellar Evolution) Offered in alternate academic years. D. Lin

**240A. Galactic and Extragalactic Stellar Systems. \*** 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. Offered in alternate academic years. The Staff

**240B. High Redshift Galaxies. \*** Galaxy formation and evolution from observations of intermediate-to-high redshift galaxies ( $z$  0.5-5). Complements and builds on 240A. Cluster galaxies and field galaxies. Foundation from classic papers on distant galaxies. Recent discoveries from IR and sub-mm measurements. Impact of AGNs and QSOs. Overview of modeling approaches. Identify theoretical and observational issues. (Formerly Galactic and Extragalactic Stellar Systems) Enrollment restricted to graduate students. Offered in alternate academic years. G. Illingworth

**257. Modern Astronomical Techniques. F** Covers physical, mathematical, and practical methods of modern astronomical observations at all wavelengths at a level that prepares students to comprehend published data and to plan their own observations. Topics include: noise sources and astrophysical backgrounds; coordinate systems; filter systems; the physical basis of coherent and incoherent photon detectors; astronomical optics and aberrations; design and use of imaging and spectroscopic instruments; antenna theory; aperture synthesis and image reconstruction techniques; and further topics at the discretion of the instructor. Familiarity with UNIX, computer programming, and completion of Physics 116C is strongly recommended as well as at least one upper-division course in astronomy. Designed for graduate students; available to qualified undergraduate astrophysics majors

## Astronomy and Astrophysics

by instructor permission. Offered in alternate academic years. T. Jeltama

### **260. Instrumentation for Astronomy. \***

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. Enrollment restricted to graduate students. C. Rockosi

### **289. Adaptive Optics and Its Application. W**

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. (Formerly course 289C.) Enrollment restricted to graduate students. Offered in alternate academic years. C. Max

### **292. Seminar (no credit). F,W,S**

Seminar attended by faculty, graduate students, and upper-division undergraduate students. The Staff

### **297. Independent Study. F,W,S**

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. The Staff

### **299. Thesis Research. F,W,S**

Students submit petition to sponsoring agency. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# BIOCHEMISTRY AND MOLECULAR BIOLOGY

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Physical and Biological Sciences Undergraduate Affairs Office  
142 Jack Baskin Engineering Building  
(831) 459-4143  
<http://undergrad.pbsci.ucsc.edu>

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## PROGRAM DESCRIPTION

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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 adviser in the Undergraduate Affairs Office as early as possible. Junior transfer students or others with questions should consult the Undergraduate Affairs web site at <http://undergrad.pbsci.ucsc.edu/>. A double major of BMB with the biological sciences majors or chemistry is not permitted. No minor is offered.

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## PROGRAM LEARNING OUTCOMES

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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:

1. 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);
2. 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, test the correctness of the solution, and interpret their results;
3. use modern library search tools to locate and retrieve scientific information about a topic, chemical, chemical technique, or an issue relating to chemistry, going beyond textbooks, common handbooks, and general online resources, such as Wikipedia;
4. know and follow the proper procedures and regulations for safe handling and use of chemicals;
5. understand the objective of their chemical experiments, properly carry out the experiments, and appropriately record and analyze the results;
6. use computers in data acquisition and processing, and use available software as a tool in data analysis;
7. use standard laboratory equipment, modern instrumentation, and classical techniques to carry out experiments;
8. communicate the concepts and results of their laboratory experiments through effective writing

## Biochemistry and Molecular Biology

and/or oral communication using the discipline standards for reporting and citation; and

9. 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.

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### DECLARATION OF THE BIOCHEMISTRY AND MOLECULAR BIOLOGY MAJOR

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#### BIOCHEMISTRY AND MOLECULAR BIOLOGY QUALIFICATION POLICY

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To qualify to declare the Biochemistry and Molecular Biology major, students must achieve a cumulative GPA of 2.50 or greater in the following courses, or their equivalents:

Chemistry 1B, General Chemistry  
Chemistry 1C, General Chemistry  
Chemistry 108A, Organic Chemistry  
Biology (BIOL) 20A, Cell and Molecular Biology

and in one of the following calculus courses:

Mathematics 11A, Calculus with Applications  
Mathematics 19A, Calculus for Science, Engineering, and Mathematics

Students with two or more grades of NP, C-, D+, D, D-, or F in the policy courses are not qualified to declare.

When calculating GPA to determine qualification:

- All courses must be taken for a letter grade, see [Letter Grade Policy](#).

Students who are informed that they are not eligible to declare the major may appeal by submitting a letter to the Biochemistry and Molecular Biology program chair within 15 days from the date the notification was mailed. Within 15 days of receipt of the appeal, the Biochemistry and Molecular Biology program chair will notify the student, the Office of the Registrar and the student's affiliated college of the decision. For more information about the appeal process, see the Physical and Biological Sciences Undergraduate Affairs web site at <http://undergrad.pbsci.ucsc.edu/>.

#### TRANSFER STUDENTS

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Applications from transfer students are encouraged. Prior to transfer, students must satisfy major qualification requirements: CHEM 1B, General Chemistry; CHEM 1C, General Chemistry; BIOL 20A, Cell and Molecular Biology; CHEM 108A, Organic Chemistry, and calculus equivalent to MATH 11A or 19A. Transfer applicants must also achieve a cumulative GPA of 2.50 across these qualification courses.

Junior-level transfer students are also strongly encouraged to complete courses equivalent to CHEM

108B, MATH 11B/19B and a physics series equivalent to PHYS 6ABC prior to transfer. Students who transfer to UCSC prior to completing the introductory requirements for the major may have difficulty completing the program within the allotted time. Prospective transfer students should review the transfer information at

<http://undergrad.pbsci.ucsc.edu/biochemistry/transfer-students/index.html>.

#### LETTER GRADE POLICY

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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.

#### PROGRAM PLANNING NOTES

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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 adviser 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 or senior thesis research. A tutorial course or a senior thesis research course may not be substituted for the required laboratory elective.

A number of graduate courses in Biochemistry and Molecular Biology are offered by 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; however, graduate courses may not be substituted for any of the elective courses required for the degree.

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### REQUIREMENTS FOR THE B.S. DEGREE

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#### LOWER-DIVISION REQUIREMENTS

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**General Chemistry:** Chemistry 1A, 1B/M, and 1C/N

**Calculus:** Mathematics 11A-B and 22; or Mathematics 19A-B and 22

**Statistics:** Applied Mathematics and Statistics 5 or 7/L

**Introductory Biology:** Biology (BIOL) 20A and Biology (BIOE) 20B

**Physics:** Physics 5A/L, 5B/M, and 5C/N; or 6A/L, 6B/M, and 6C/N

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### UPPER-DIVISION REQUIREMENTS

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Organic Chemistry: Chemistry 108A/L, 108B/M

**Biochemistry and Molecular Biology:** Biochemistry and Molecular Biology (BIOC) 100A, 100B, and 100C and BIOL 101L (formerly 100K)

**Genetics:** Biology (BIOL) 105

**Cell Biology:** Biology (BIOL) 110

**Molecular Biology:** Biology (BIOL) 115

**Physical Chemistry:** Chemistry 163A and 163B

One of the following laboratory courses:

Biochemistry and Molecular Biology (BIOC) 110L, Advanced Biochemistry Laboratory

Biology (BIOL) 100L, Biochemistry Laboratory

Biology (BIOL) 105L, Eukaryotic Genetics Laboratory

Biology (BIOL) 105M, Microbial Genetics Laboratory

Biology (BIOL) 109L, Yeast Molecular Genetics Laboratory

Biology (BIOL) 110L, Cell Biology Laboratory

Biology (BIOL) 115L, Eukaryotic Molecular Biology Laboratory

Biology (BIOL) 121L, Environmental Phage Biology Laboratory

Biology (BIOL) 186L, Undergraduate Research in MCD Biology

Biology (BIOL) 187L, Molecular Biotechnology Laboratory

Microbiology and Environmental Toxicology (METX) 119L, Microbiology Laboratory

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### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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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 following courses: BIOC 110L, BIOL 100L, 105L, 105M, 109L, 110L, 115L, 121L, 186L, 187L, or METX 119L. The DC requirement must be satisfied at UCSC and may not be transferred from another institution.

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### BIOCHEMISTRY AND MOLECULAR BIOLOGY PLANNER

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<http://undergrad.pbsci.ucsc.edu/programs/bioc/biochs.html>

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### COMPREHENSIVE REQUIREMENT

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Students must satisfy the comprehensive requirement by receiving a passing letter grade in any of the independent research laboratory listed in the previous section. In addition, students are encouraged to complete a senior thesis or a senior essay (see Chemistry and Biochemistry for more information).

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### MATERIALS FEE

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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 \$15 to \$75 per course. Students may incur additional expenses purchasing individual supplies.

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### Honors in the Major

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.

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## BIOCHEMISTRY AND MOLECULAR BIOLOGY FACULTY AND PROFESSIONAL INTERESTS

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**James Ackman, Assistant Professor, Molecular, Cell, and Developmental Biology**

Brain circuit structure and function

**Roger W. Anderson, Emeritus, Chemistry and Biochemistry**

**Manuel Ares Jr., Professor, Molecular, Cell, and Developmental Biology**

Regulation of RNA processing, structure, function, and evolution of RNA-based systems

**Alexander Ayzner, Assistant Professor, Chemistry and Biochemistry**

Experimental physical chemistry; organic semiconductors; molecular spectroscopy; electron transfer dynamics; X-ray scattering and spectroscopy

**Ilan Benjamin, Professor, Chemistry and Biochemistry**

Theoretical chemistry, molecular dynamics of chemical reactions in liquids and at interfaces

**Claude F. Bernasconi, Emeritus, Chemistry and Biochemistry**

**Needhi Bhalla, Assistant Professor, Molecular, Cell, and Developmental Biology**

Meiotic chromosome dynamics

**Hinrich Boeger, Associate Professor, Molecular, Cell, and Developmental Biology**

Chromatin dynamics and transcriptional regulation

**Roberto A. Bogomolni, Professor, Chemistry and Biochemistry**

Biophysical chemistry, photobiology, light energy conversion and signal transduction in biological systems

**Barry Bowman, Professor, Molecular, Cell, and Developmental Biology**

Membrane biochemistry and genetics, biochemistry and molecular biology of membrane proteins

**Rebecca Braslau, Professor, Chemistry and Biochemistry**

Synthetic organic chemistry: new synthetic methodologies using free radicals; nitroxides, nitroxide mediated "living" polymerizations: design and functionalization of tailored polymers for biomedical applications and nanotechnology, profluorescent nitroxides as sensors, synthetically modified polymers, development of non-migratory plasticizers

**Bin Chen, Associate Professor, Molecular, Cell, and Developmental Biology**

Mammalian brain development

**Shaowei Chen, Professor, Chemistry and Biochemistry**

Synthesis, characterization, and manipulation of novel functional nanomaterials (metals and semiconductors); surface engineering of nanoparticles; nanoscale electron transfer; applications in fuel cells, photocatalysis, photovoltaics, and nano optoelectronics.

**Philip O. Crews, Research Professor, Chemistry and Biochemistry**

**Ólöf Einarsdóttir, Professor, Chemistry and Biochemistry**

Time-resolved spectroscopy; biophysics and bioenergetics; heme-copper oxidases; electron transfer and ligand binding; application of photolabile NO and O<sub>2</sub> donors; molecular dynamics simulations of ligand access channels in heme-copper oxidases

**David Feldheim, Professor, Molecular, Cell, and Developmental Biology**

Developmental neuroscience

**Grant Hartzog, Professor, Molecular, Cell, and Developmental Biology**

Biochemistry, genetics, chromatin and transcriptional regulation

**Lindsay Hinck, Professor, Molecular, Cell, and Developmental Biology**

Breast development and cancer, cell biology, development

**Theodore R. Holman, Professor, Chemistry and Biochemistry**

Biochemistry and bioinorganic chemistry; lipoxygenase enzymology, protein engineering, inhibitor discovery, computer inhibitor design, mass spectroscopy, electron paramagnetic resonance

**Melissa Jurica, Professor, Molecular, Cell, and Developmental Biology**

Structure and function of human splicing machinery

**Rohinton T. Kamakaka, Professor, Molecular, Cell, and Developmental Biology**

Nuclear organization, Chromatin domains, Epigenetic gene regulation and Insulators

**Douglas R. Kellogg, Professor, Molecular, Cell, and Developmental Biology**

Control of cell growth and size

**David S. Kliger, Research Professor, Chemistry and Biochemistry**

Time-resolved laser spectroscopy, biophysics, studies of visual transduction, protein function, and protein folding

**Joseph P. Konopelski, Professor, Chemistry and Biochemistry**

Synthetic organic chemistry; heterocyclic chemistry, bioorganic chemistry

**Yat Li, Associate Professor, Chemistry and Biochemistry**

Experimental physical chemistry, materials chemistry, nanomaterials, nanoscale photonics and electronics, energy conversion

**R.Scott Lokey, Professor, Chemistry and Biochemistry**

Organic chemistry; combinatorial synthesis, biotechnology, molecular cell biology

**Robert A. Ludwig, Professor, Molecular, Cell, and Developmental Biology**

Plant microbe interactions, photorespiration, genetic recombination in plants

**Pradip Mascharak, Professor, Chemistry and Biochemistry**

Bioinorganic chemistry, design of antitumor drugs, modeling of active sites of metalloenzymes, design of catalysts for hydrocarbon oxidation, studies on intermediates in non-heme oxygenase chemistry, design of NO-donors for photodynamic therapy

**Glenn L. Millhauser, Professor, Chemistry and Biochemistry**

Electron paramagnetic resonance; nuclear magnetic resonance, protein structure and function, peptide synthesis, prions, melanocortin signaling

**Harry F. Noller, Professor, Molecular, Cell, and Developmental Biology**

Ribosome structure and function; mechanisms of protein synthesis

**Scott R. Oliver, Professor, Chemistry and Biochemistry**

Materials chemistry: nanoporous inorganic and metal-organic materials for environmental cleanup of water, desulfurization of fuel and biomaterials

**Carrie Partch, Assistant Professor, Chemistry and Biochemistry**

Biochemistry and biophysics, nuclear magnetic resonance spectroscopy; molecular mechanism of circadian rhythmicity

**Amy Ralston, Assistant Professor, Molecular, Cell, and Developmental Biology**

Origins and regulation of mammalian stem cells

**Jevgenij Raskatov, Assistant Professor, Chemistry and Biochemistry**

Chemical biology, organic chemistry, molecular modeling, chemotherapy, inflammation

**Michael Rexach, Professor, Molecular, Cell, and Developmental Biology**

Structure and function of nuclear pore complex, nuclear transport

**Seth M. Rubin, Associate Professor, Chemistry and Biochemistry**

Biomolecular mechanisms of cell-cycle regulation and cancer; structural biology and biochemistry; macromolecular x-ray crystallography; nuclear magnetic resonance

**Jeremy Sanford, Associate Professor, Molecular, Cell, and Developmental Biology**

Genomic analysis of protein-RNA interactions

**William M. Saxton, Professor, Molecular, Cell, and Developmental Biology**

Cytoskeletal motors and active transport processes

**Thomas W. Schleich, Emeritus, Chemistry and Biochemistry**

**William G. Scott, Professor, Chemistry and Biochemistry**

Structure and function of RNA, proteins, and their complexes, origin of life

**Bakthan Singaram, Professor, Chemistry and Biochemistry**

Organic synthesis, organoborane chemistry, heterocyclic chemistry, organometallic chemistry, asymmetric synthesis, biosensors, and natural products chemistry

**Michael Stone, Associate Professor, Chemistry and Biochemistry**

Molecular basis of telomere length and telomerase-related diseases; biophysical characterization of nucleic acid-associated molecular motors; development of novel approaches for imaging enzymes in cells

**Susan Strome, Professor, Molecular, Cell, and Developmental Biology**

Chromatin and RNA regulation in *C. elegans*

**William T. Sullivan, Professor, Molecular, Cell, and Developmental Biology**

Cell cycle, cytoskeleton, and host-pathogen interactions

**Eugene Switkes, Emeritus, Chemistry and Biochemistry**

**John W. Tamkun, Professor, Molecular, Cell, and Developmental Biology**

Transcriptional regulation, molecular genetics of *Drosophila* development, regulation of gene expression

**Zhu Wang, Assistant Professor, Molecular, Cell, and Developmental Biology**

Prostate development and cancer, tissue stem cell

**W. Todd Wipke, Emeritus, Chemistry and Biochemistry**

**Alan M. Zahler, Professor, Molecular, Cell, and Developmental Biology**

Alternative pre-mRNA splicing and small RNA function

**Jin Z. Zhang, Professor, Chemistry and Biochemistry**

Design, synthesis, characterization, and application of nanomaterials, including semiconductors, metals, and metal oxides; ultrafast dynamics and laser spectroscopy; cancer diagnosis and therapy; solar energy conversion; surface-enhanced Raman spectroscopy (SERS).

**Martha C. Zúñiga, Professor, Molecular, Cell, and Developmental Biology**

Negative selection of autoreactive T cells in the thymus and in peripheral lymphoid organs, immunological tolerance to epithelial antigens, MHC transfer between keratinocytes and dendritic cells

**Yi Zuo, Associate Professor, Molecular, Cell, and Developmental Biology**

Synaptic plasticity in learning and memory

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## BIOCHEMISTRY AND MOLECULAR BIOLOGY COURSES

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### UPPER-DIVISION COURSES

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#### **100A. Biochemistry and Molecular Biology. F**

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. (Formerly Biochemistry.)

Prerequisite(s): Chemistry 108B or 112C; and Biology 20A M. Stone

#### **100B. Biochemistry and Molecular Biology. W**

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. (Formerly Biochemistry.) Prerequisite(s): course 100A C. Partch

#### **100C. Biochemistry and Molecular Biology. S**

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(s): course 100B C. Saltikov

#### **110L. Advanced Biochemistry Laboratory. F**

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. (Formerly course 110, Biochemistry Laboratory) Prerequisite(s): course 100B and satisfaction of the Entry Level Writing and Composition requirements. (General Education Code(s): W.) O. Einarsdottir

Revised 09/01/2015

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# BIOLOGY BACHELOR OF SCIENCE AND BIOLOGY MINOR

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Physical and Biological Sciences Undergraduate Affairs Office  
142 Jack Baskin Engineering Building  
(831) 459-4143  
<http://undergrad.pbsci.ucsc.edu>

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## PROGRAM DESCRIPTION

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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 Departments of Ecology and Evolutionary Biology (EEB) and Molecular, Cell, and Developmental Biology (MCDB) offer a broad spectrum of courses that reflect the exciting new developments and directions in the field of biology. 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 departments include RNA molecular biology, molecular and cellular aspects of genetics and development, neurobiology, microbial biochemistry, plant biology, animal behavior, physiology, evolution, ecology, and marine biology. Many students take advantage of the numerous 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 a bachelor of arts (B.A.), including a bioeducation concentration, or bachelor of science (B.S.) degree. Advanced undergraduates, with the guidance of faculty mentors, have access to extensive departmental laboratory facilities for independent research. Fieldwork draws on a remarkable variety of terrestrial habitats, as well as ready access to Monterey Bay and the open Pacific. Hospitals, convalescent and physical therapy centers, veterinary clinics, and other enterprises in the vicinity

of the campus provide the opportunity to pursue field projects and internships comparable to on-the-job training. This array of opportunities for directed independent study enables biology majors to enhance their upper-division programs to reflect and strengthen their own interests and goals in the sciences.

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## PREREQUISITES

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The introductory biology sequence is prerequisite to virtually all upper-division biology courses. BIOL 20A has a prerequisite of Chemistry 1A and 1B. Therefore, it is essential for students considering a major in biology to start chemistry as soon as possible. Students who have not taken Chemistry 1A or 1B but are prepared to begin biology 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.

An online Mathematics Placement Examination is offered at various periods prior to enrollment for each quarter. Biological science majors are expected to take this examination. For more information see the Physical and Biological Sciences Undergraduate Affairs web site at <http://undergrad.pbsci.ucsc.edu>.

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## LETTER GRADE POLICY

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For all students entering UCSC in fall 2001 and later, all courses used to satisfy any of the biological sciences majors must be taken for a letter grade.

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## BIOLOGY B.S. QUALIFICATION POLICY

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To qualify for the Biology B.S. majors, students must pass (with a grade of C or better) the following courses or their equivalents:

Chemistry and Biochemistry 1A, General Chemistry;  
Chemistry and Biochemistry 1B, General Chemistry;  
Chemistry and Biochemistry 1C, General Chemistry;  
Biology: Molecular, Cell, and Developmental Biology (BIOL) 20A, Cell and Molecular Biology;

## Biology Bachelor of Science and Biology Minor

Biology: Ecology and Evolutionary Biology (BIOE) 20B, Development and Physiology.

Students with two or more grades of NP, C-, D+, D, D-, or F in the policy courses are not qualified to declare.

When assessing qualification:

- All courses must be taken for a letter grade, see [Letter Grade Policy](#).
- Students with AP credit for Biology: Molecular, Cell, and Developmental Biology (BIOL) 20A and Biology: Ecology and Evolutionary Biology (BIOE) 20B, and AP credit for Chemistry and Biochemistry 1A, need only pass Chemistry and Biochemistry 1B and 1C to qualify.
- Students with non-grades (I, IP, DG, etc.) in any of the policy courses will not be eligible to declare until a grade has been assigned.
- Every student who satisfies the major qualification requirements and who petitions to declare the major by the campus major declaration deadline (i.e., before enrolling in their third year or the equivalent) will be admitted to the major. Students enrolled in their final qualification policy course at the major declaration deadline may submit the petition, but will not be declared until satisfactory grades have been posted. Students who satisfy the major admission requirements but who petition to declare the major after the campus major declaration deadline will be considered on a case-by-case basis for admission to the major; admission is not guaranteed.
- Students who are informed that they are not eligible to declare the major may appeal this decision by submitting a letter to the MCD Biology Faculty Advisor 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.”

For more information about the appeal process see the Physical and Biological Sciences Undergraduate Affairs web site at

<http://undergrad.pbsci.ucsc.edu/mcdb/qualifying/appeal-process.html>.

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## TRANSFER STUDENTS

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Applications from transfer students in the biological sciences are encouraged. Prior to transfer, students must satisfy major qualification requirements: CHEM 1A, General Chemistry; CHEM 1B, General Chemistry; CHEM 1C, General Chemistry; BIOL 20A, Cell and Molecular Biology; BIOE 20B, Development and Physiology. Junior-level transfer students are also strongly encouraged to complete courses equivalent to

MATH 11A, MATH 11B, and AMS 5 prior to transfer. Prospective transfer students should review the transfer information at <http://assist.org> and our web site at <http://undergrad.pbsci.ucsc.edu/biology/transfer-students/index.html>.

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## DECLARING A BIOLOGY B.S. MAJOR

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Students may submit a petition to declare after completing the qualification policy courses noted above. Students enrolled in their final policy course may submit the petition to declare, but will not be declared until grades have been posted. For instructions on petitioning to declare go the Physical and Biological Sciences Undergraduate Affairs web site: [undergrad.pbsci.ucsc.edu/](http://undergrad.pbsci.ucsc.edu/).

Students may not pursue multiple majors combining a Biology major (B.A., B.S., bioeducation concentration, or minor) with any other biological sciences major (Ecology and Evolution; Marine Biology; Plant Sciences; Environmental Studies/Biology combined major; Molecular, Cell and Developmental Biology; Neuroscience; Human Biology; and Biochemistry and Molecular Biology).

### BIOLOGY B.S. MAJOR REQUIREMENTS

#### Introductory Requirements

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Introductory Biology: BIOL 20A, BIOE 20B and 20C

General Chemistry: Chemistry 1A, 1B and 1C/N

Organic Chemistry: Chemistry 108A/L and 108B

Calculus: Mathematics 11A-B or 19A-B

Statistics: Applied Mathematics and Statistics 5 or 7/L

Physics: Physics 6A/L, and 6B or 6C

#### Advanced Requirements

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Students must complete one upper-division biology course that includes regular laboratory or fieldwork. (In addition to BIOL 101L, a lab or field course must be completed).

Six core courses and one lab course:

Biochemistry: BIOL 100/K

Molecular Biology BIOL 101\*

Molecular Biology Laboratory: BIOL 101L

Genetics: BIOL 105

Cell Biology: BIOL 110

Ecology: BIOE 107

Evolution: BIOE 109

\*Instead of Biochemistry (BIOL 100) and Molecular Biology (BIOL 101), students may complete the series in Biochemistry and Molecular Biology 100A, 100B, 100C. (Upon completion of the series, Biochemistry and Molecular Biology 100C may be used to satisfy one lecture elective.)

## Biology Bachelor of Science and Biology Minor

Students must complete three additional upper-division (5-7 credits) biology electives chosen from Biological Sciences-EEB courses (BIOE) or Biological Sciences-MCDB courses (BIOL) below.

BIOL 111A, Immunology I  
BIOL 113, Mammalian Endocrinology  
BIOL 114, Cancer Cell Biology  
BIOL 115, Eukaryotic Molecular Biology  
BIOL 120, Developmental Biology  
BIOL 125, Introduction to Neuroscience  
BIOL 178, Stem Cell Biology  
BIOL 182, Genomes  
BIOL 130, Human Physiology  
BIOE 108, Marine Ecology  
BIOE 112/L, Ornithology  
BIOE 114/L, Herpetology  
BIOE 117/L, Systematic Botany  
BIOE 120/L, Marine Botany  
BIOE 122/L, Invertebrates  
BIOE 124/L, Mammology  
BIOE 127/L, Ichthyology  
BIOE 129/L, Marine Mammals  
BIOE 131, Animal Physiology  
BIOE 133/L, Exercise Physiology  
BIOE 134/L, Comparative Vertebrate Anatomy  
BIOE 135 /L, Plant Physiology  
BIOE 137/L, Molecular Ecology  
BIOE 140, Behavioral Ecology  
BIOE 145, Plant Ecology  
BIOE 147, Community Ecology  
BIOE 148, Quantitative Ecology  
BIOE 149, Disease Ecology  
BIOE 155, Freshwater Ecology  
BIOE 161, Kelp Forest Ecology  
BIOE 163/L, Ecology of Reefs, Mangroves, and Seagrasses  
BIOE 165, Marine Conservation Biology  
BIOE 172, Population Genetics  
Microbiology and Environmental Toxicology (METX)  
119, Microbiology

### Disciplinary Communication (DC) Requirement

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Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement for the biology bachelor of science degree is satisfied by completing courses BIOE 107, Ecology, or BIOE 108, Marine Ecology, and BIOE 109, Evolution, or BIOE 159A, Marine Ecology Field Quarter.

## Biology B.S. Sample Planners

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For freshmen:

<http://undergrad.pbsci.ucsc.edu/biology/biolbs/biolbs-frosh-plans.html>

For transfer students:

<http://undergrad.pbsci.ucsc.edu/mcdb/mcdbbs/mcdbbs-transfer-plans.html>

## Comprehensive Requirement

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All majors in the biological sciences require a comprehensive requirement. This requirement can be satisfied in one of the following ways:

- by receiving a passing grade in an internship, independent research laboratory, or field course:

BIOE 114L, Field Methods in Herpetological Research  
BIOE 112L Ornithology Laboratory  
BIOE 117L, Systematic Botany Laboratory  
BIOE 120L, Marine Botany Laboratory  
BIOE 122L, Invertebrates Laboratory  
BIOE 124L, Mammology Laboratory  
BIOE 127L, Ichthyology Laboratory  
BIOE 128L, Large Marine Vertebrates Field  
BIOE 131L, Animal Physiology Laboratory  
BIOE 133L, Exercise Physiology Laboratory  
BIOE 134L, Comparative Vertebrate Anatomy Laboratory  
BIOE 135L, Plant Physiology Laboratory  
BIOE 137L, Molecular Ecology  
BIOE 141L, Behavioral Ecology Field Course  
BIOE 145L, Field Methods in Plant Ecology  
BIOE 150L, Ecological Field Methods  
BIOE 151, Ecology and Conservation in Practice  
BIOE 158L, Marine Ecology Laboratory  
BIOE 159, Marine Ecology Field Quarter  
BIOE 161L, Kelp Forest Ecology Laboratory  
BIOE 163L, Ecology of Reefs, Mangroves, and Seagrasses Laboratory  
BIOE 172L, Population Genetics Laboratory  
BIOE 183, Undergraduate Research in EEB  
BIOL 100L, Biochemistry Laboratory  
BIOL 105L, Eukaryotic Genetics Laboratory  
BIOL 105M, Microbial Genetics Laboratory  
BIOL 109L, Yeast Molecular Genetics Laboratory  
BIOL 110L, Cell Biology Laboratory  
BIOL 111L, Immunology Laboratory  
BIOL 115L, Eukaryotic Molecular Biology Laboratory  
BIOL 120L, Developmental Biology Laboratory  
BIOL 121L, Environmental Phage Biology Laboratory  
BIOL 130L, Human Physiology Laboratory  
BIOL 178L, Protocols in Stem Cell Biology  
BIOL 186L, Undergraduate Research in MCD Biology  
BIOL 186R, Undergraduate Research in MCD Biology  
BIOL 187L, Molecular Biotechnology Laboratory

## Biology Bachelor of Science and Biology Minor

BIOL 189, Health Sciences Internship  
Biochemistry and Molecular Biology (BIOC) 110L,  
Advanced Biochemistry Laboratory  
METX 119L, Microbiology Laboratory

- by completing a senior thesis;
- by 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 biological sciences advising office before the last day of the graduating quarter;
- by 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 biological sciences advising office before the last day of the graduating quarter.

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### BIOLOGY MINOR REQUIREMENTS

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The biology minor is designed to incorporate elements of both EEB and MCD disciplines.

#### Lower-division requirements:

- Introductory biology: BIOL 20A, BIOE 20B, BIOE 20C
- Introductory chemistry: CHEM 1A, CHEM 1B, CHEM 1C

#### Upper-division requirements:

- CHEM 108A Organic Chemistry
- BIOL 100 Biochemistry
- BIOL 105 Genetics
- BIOE 107 Ecology
- BIOE 109 Evolution

There is no senior comprehensive for the biology minor. Please contact Physical and Biological Sciences Undergraduate Affairs Office for further information.

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### HONORS

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Honors in biology 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.

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### COURSE SUBSTITUTION/TRANSFER CREDIT POLICY

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At least half of the upper-division courses (numbered 100–190) required for each major must be taken through the biological sciences program at UCSC, not as transfer credits from another department or institution. Transfer students are advised to contact the Physical

and Biological Sciences Undergraduate Affairs Office before enrolling in numerous upper-division courses at other institutions. For more information on transferring courses to UCSC, please consult the undergraduate web site at <http://undergrad.pbsci.ucsc.edu>.

A maximum of one upper-division course requirement may be met with a research-based independent study or graduate-level UCSC biology course or a course offered by another UCSC department.

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### EDUCATION ABROAD OPPORTUNITIES

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The UC Education Abroad Program (EAP) offers qualified students unique opportunities to broaden their educational horizons. Both the Ecology and Evolutionary Biology and the Molecular, Cell and Developmental Biology departments encourage 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. Visit the EAP office as soon as possible to begin planning; you must seek advice about your EAP plan for major courses at UCSC from the biological sciences undergraduate adviser and/or faculty adviser and receive their approval for your plans.

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### MEDICAL AND PROFESSIONAL SCHOOL ADMISSION

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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.

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### ACADEMIC ADVISING

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Academic advising is available at the Physical and Biological Sciences Undergraduate Affairs Office. Students should take full advantage of this opportunity and should keep in frequent touch with the office to stay informed about late announcements of courses, changes in scheduling, and opportunities for special study.

The undergraduate web site (<http://undergrad.pbsci.ucsc.edu>) serves as the program handbook containing advice and information pertinent to students' most frequently voiced questions. Each student in the major should review the

Biology Bachelor of Science and Biology Minor

information posted on the web site; for further assistance, contact an academic adviser.

Revised 09/01/2015

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# BIOLOGY: ECOLOGY AND EVOLUTIONARY BIOLOGY

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Ecology and Evolutionary Biology Department  
A308 Earth and Marine Sciences  
(831) 459-5358  
<http://www.eeb.ucsc.edu>

Physical and Biological Sciences Undergraduate Affairs Office  
142 Jack Basking Engineering Bldg.  
(831) 459-4143  
<http://undergrad.pbsci.ucsc.edu>

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## PROGRAM DESCRIPTION

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### UNDERGRADUATE PROGRAM DESCRIPTION

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The Department of Ecology and Evolutionary Biology (EEB) is devoted to the study of ecological and evolutionary processes across marine, terrestrial, and freshwater environments. The past 30 years have seen several revolutions in our understanding of how the biological world works. Advances in both analytical and genetic methods have given us a far more sophisticated understanding of the complexities of ecological and evolutionary processes in the natural world. Biologists at UCSC 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 the Far East. This emphasis on field and laboratory studies is the hallmark of 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. UCSC 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. Students may choose from the following major options:

Biology B.A.  
Biology B.A. (Bioeducation concentration)  
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).

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 habitats, as well as ready access to Monterey Bay and the open Pacific. Terrestrial studies are supported by the UCSC 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 Long Marine Laboratory. Marine studies are supported by the Long Marine Laboratory 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. In addition to coursework, there is an array of opportunities for directed independent study that enables biological science majors to enhance their

## Biology: Ecology and Evolutionary Biology

upper-division programs to reflect and strengthen their own interests and goals in the sciences.

### PREREQUISITES

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The introductory biology sequence is prerequisite to virtually all upper-division biology courses. BIOL 20A has a prerequisite of Chemistry 1A and 1B. Therefore, it is essential for students considering a major in the biological sciences to start chemistry as soon as possible. Students who have not taken Chemistry 1A or 1B but are prepared to begin biology 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.

An online Mathematics Placement Examination is offered at various periods prior to enrollment for each quarter. Biological science majors are expected to take this examination. For more information see the Mathematics Placement Exam web site at <http://undergrad.pbsci.ucsc.edu/enrollment/math/math-placement/index.html>.

### LETTER GRADE POLICY

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For all students entering UCSC in fall 2001 and later, all courses used to satisfy any of the majors must be taken for a letter grade.

#### **Qualification Policy for all Majors in the Department of Ecology and Evolutionary Biology**

To qualify for any of the majors sponsored by the department of Ecology and Evolutionary Biology, except the combined major with Environmental Studies, students must complete the following courses, or their equivalents, with a grade of C or better:

CHEM 1A, General Chemistry (offered by the Chemistry Department)

CHEM 1B, General Chemistry (offered by the Chemistry Department)

BIOL 20A, Cell and Molecular Biology (offered by the Molecular, Cell, and Developmental Biology Department)

- BIOE 20B, Development and Physiology
- BIOE 20C, Ecology and Evolution,

One of the following calculus courses offered by the Mathematics Department

MATH 11A, Calculus with Applications

MATH 19A, Calculus for Science, Engineering, and Mathematics

Neither of these mathematics courses will be included in the calculation in the maximum number of C-, D+, D, D-, or F grades for admission to the major.

#### Determining qualification:

Students who complete all the qualification courses with a grade of C or better are allowed to declare a major.

Students who have received one grade of NP, C-, D+, D, D-, or F in one of the qualification courses will only be allowed to declare after successfully completing the same or an equivalent course with a grade of C or better.

Students with two or more grades of NP, C-, D+, D, D-, or F in the qualification courses are not allowed to declare.

Students with AP credit for any of the qualification course(s) are allowed to declare after successfully completing the remaining qualification courses.

Students with non-grades in any of the qualification courses will not be allowed to declare until a grade of C or better has been assigned.

Students who are not eligible to declare the major may appeal this decision by submitting a letter to the department chair within 15 days of the denial of the declaration. Within 15 days of receipt of the appeal, the department will notify the student, college, and Office of the Registrar of the decision. For more information about the appeal process see the Physical and Biological Sciences Undergraduate Affairs website at: <http://undergrad.pbsci.ucsc.edu/eeb/qualifying/appeal-process.html>.

### TRANSFER STUDENTS

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EEB encourages applications from transfer students in the biological sciences. In fall 2012 the department established a [Qualification Policy](#) that limits access to the program to those students who have completed a subset of foundational coursework. Transfer students are held to similar criteria for accessing the major.

To be considered for admission to UCSC as one of the EEB majors, transfer students must pass equivalents of the following courses with a C (2.0) or better in these preparatory courses:

- BIOL 20A, Cell and Molecular Biology
- One of the following courses offered by the Ecology and Evolutionary Biology Department:
  - BIOE 20C, Ecology and Evolution
  - BIOE 20B, Development and Physiology
- CHEM 1A, General Chemistry
- CHEM 1B, General Chemistry
- One of the following calculus courses
  - MATH 11A, Calculus with Applications
  - MATH 19A, Calculus for Science, Engineering, and Mathematics

## Biology: Ecology and Evolutionary Biology

For more information on qualifying for the major as a transfer applicant, visit: <http://undergrad.pbsci.ucsc.edu/eeb/transfer-students/transfer-admissions.html>.

In addition to the required coursework for admission, students should complete courses equivalent to the calculus, general chemistry, and introductory biology requirements for the major they wish to pursue. Students who transfer without having completed the prerequisite coursework may have difficulty enrolling in courses and may require more than two years to complete their EEB-sponsored degree.

Prospective transfer students should review the transfer information at: <http://undergrad.pbsci.ucsc.edu/eeb/transfer-students/index.html>.

### DECLARING A MAJOR

Students may submit a petition to declare after completing the qualification policy courses. Students who are enrolled in their final qualification policy course may submit the petition, but will not be declared until grades have been posted. For instructions on petitioning to declare go to the Physical and Biological Sciences Undergraduate Affairs web site at: <http://undergrad.pbsci.ucsc.edu/eeb/qualifying/petition-to-declare.html>.

### DOUBLE MAJOR IN THE BIOLOGICAL SCIENCES

Students interested in pursuing multiple majors within the biological sciences may not declare any combination of Biology (B.A., B.S., bioeducation concentration, or minor), Ecology and Evolution, Marine Biology, Plant Sciences, or Environmental Studies/Biology combined major.

### GENERAL BIOLOGY BACHELOR OF ARTS MAJOR

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 a biology faculty adviser whose interests reflect the student's interests.

### GENERAL BIOLOGY B.A. MAJOR REQUIREMENTS

#### **Introductory Requirements**

Introductory Biology: BIOL 20A, BIOE 20B and 20C

General Chemistry: Chemistry 1A and 1B

Calculus: Mathematics 11A

Statistics: Applied Mathematics and Statistics 5 or 7/L

Physics: Physics 6A/L

#### **Advanced Requirements**

A total of eight upper-division biology courses, as follows:

Three core courses:

Genetics: BIOL 105

Evolution: BIOE 109

Ecology: BIOE 107

One of the following anatomy or physiology courses:

BIOE 131/L, Animal Physiology/Laboratory

BIOE 133/L, Exercise Physiology/Laboratory

BIOE 134/L, Comparative Vertebrate

Physiology/Laboratory

BIOE 135/L, Plant Physiology/Laboratory

BIOL 130/L, Human Physiology/Laboratory

METX 135/L, Human Anatomy/Laboratory

#### **Electives**

Four additional electives chosen from the following:

BIOE 108, Marine Ecology

BIOE 112/L, Ornithology/Laboratory

BIOE 114/L, Herpetology/Laboratory

BIOE 117/L, Systematic Botany/Laboratory

BIOE 118, Plants and Society: The Biology of Food, Shelter, and Medicine

BIOE 120/L, Marine Botany/Laboratory

BIOE 122/L, Invertebrate Zoology/Laboratory

BIOE 124/L, Mammology/Laboratory

BIOE 127/L, Ichthyology/Laboratory

BIOE 128L, Large Marine Vertebrates Field Course

BIOE 129/L, Biology of Marine Mammals/Laboratory

BIOE 131/L, Animal Physiology/Laboratory

BIOE 133/L, Exercise Physiology/Laboratory

BIOE 134/L, Comparative Vertebrate

Physiology/Laboratory

BIOE 135/L, Plant Physiology/Laboratory

BIOE 137/L, Molecular Ecology/Laboratory

BIOE 140, Behavioral Ecology

BIOE 141L, Behavioral Ecology Field Course

BIOE 145, Plant Ecology

BIOE 145L, Field Methods in Plant Ecology

BIOE 147, Community Ecology

BIOE 148, Quantitative Ecology

BIOE 149, Disease Ecology

BIOE 150, Ecological Field Methods

BIOE 150L, Ecological Field Methods Laboratory

BIOE 151ABCD, Ecology and Conservation in Practice

BIOE 155, Freshwater Ecology

BIOE 155L, Freshwater Ecology Laboratory

BIOE 158L, Marine Ecology Laboratory

BIOE 159ABCD, Marine Ecology Field Quarter

BIOE 161, Kelp Forest Ecology

BIOE 161L, Kelp Forest Ecology Laboratory

## Biology: Ecology and Evolutionary Biology

BIOE 163/L, Ecology of Reefs, Mangroves, and Seagrasses/Laboratory  
BIOE 165, Marine Conservation Biology  
BIOE 172/L, Population Genetics/Laboratory  
BIOL 100, Biochemistry  
BIOL 101/L, Molecular Biology/Laboratory  
BIOL 110, Cell Biology  
BIOL 111, Immunology  
BIOL 113, Endocrinology  
BIOL 115, Eukaryotic Molecular Biology  
BIOL 120, Development  
BIOL 125, Introduction to Neuroscience  
Chemistry 108A, Organic Chemistry  
Chemistry 108B, Organic Chemistry  
Microbiology and Environmental Toxicology 119, Microbiology  
Microbiology and Environmental Toxicology 119L, Microbiology Laboratory

### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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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 courses BIOE 107, Ecology, and BIOE 109, Evolution.

### GENERAL BIOLOGY B.A. SAMPLE PLANNERS

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For freshmen:

<http://undergrad.pbsci.ucsc.edu/biology/biolba/biolba-frosh-plans.html>

For transfer students:

<http://undergrad.pbsci.ucsc.edu/biology/biolba/biolba-transfer-plans.html>

### GENERAL BIOLOGY, BIOEDUCATION CONCENTRATION, B.A.

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The General Biology, Bioeducation Concentration, B.A. major is designed to meet the needs of students who plan careers as K-12 science teachers. It provides students with a rigorous education in biology through science breadth courses to prepare them for the state credentialing examinations (CSET) in biology/life sciences, and courses covering education theory and practical teaching experience through internships in local schools.

General Biology, Bioeducation Concentration, B.A. Requirements

### INTRODUCTORY REQUIREMENTS

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Introductory Biology: BIOL 20A, BIOE 20B and 20C  
General Chemistry: Chemistry 1A, 1B and 1C/N  
Organic Chemistry: Chemistry 108A/L and 108B  
Calculus: Mathematics 11A-B or 19A-B

Statistics: Applied Mathematics and Statistics 5 or 7/L  
Physics: Physics 6A/L, and 6B or 6C  
Education: Education 50C  
Earth Sciences: Earth Sciences 20/L (optional\*)  
Astronomy: Astronomy 2 (optional\*)

\*These courses are recommended for students interested in pursuing a credential to teach general science.

### ADVANCED REQUIREMENTS

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A total of 10 upper-division biology and education courses, and associated laboratories, as follows:

BIOL 100, Biochemistry  
BIOL 105, Genetics  
BIOE 107, Ecology  
BIOE 109, Evolution  
Education 185C, Introduction to Teaching Science  
Education 185L, Introduction to Teaching: CalTeach 3  
Education 100C and one of the Issues of Diversity in Education course from the following:

EDUC 128, Immigrants and Education  
EDUC 141, Bilingualism and Schooling  
EDUC 164, Urban Education  
EDUC 181, Race, Class, and Culture in Education

Students must fulfill the major distribution requirement, which includes one course from each of the following groups:

#### Cell/developmental biology:

BIOL 110, Cell Biology  
BIOL 115, Eukaryotic Molecular Biology  
BIOL 120, Developmental Biology  
Microbiology and Environmental Toxicology 119, Microbiology

#### Physiology:

BIOE 131, Animal Physiology  
BIOE 135, Plant Physiology  
BIOL 113, Endocrinology  
BIOL 130, Human Physiology

#### Biology Laboratory:

One 5-credit, upper-division biology laboratory course, or

BIOE 131L, Animal Physiology Laboratory  
BIOE 135L, Plant Physiology Laboratory  
BIOL 130L, Human Physiology Laboratory

(BIOL/METX 135L cannot be used to satisfy the laboratory requirement in the bioeducation concentration.)

**For information on the general biology minor, see [Biology B.S. and Minor](#)**

## ECOLOGY AND EVOLUTION MAJOR

The ecology and evolution major provides students with interdisciplinary skills necessary for understanding and solving complex problems in ecology, evolution, behavior, and physiology. While some of these disciplines focus on molecular or chemical mechanisms, they all 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 (EAP) in Costa Rica (tropical biology) and Australia (marine sciences).

## ECOLOGY AND EVOLUTION B.S. MAJOR REQUIREMENTS

### Introductory Requirements

Introductory Biology: BIOL 20A, BIOE 20B and 20C  
General Chemistry: Chemistry 1A, 1B and 1C/N  
Calculus: Mathematics 11A-B or 19A-B  
Biostatistics: Applied Mathematics and Statistics 7/L  
Physics: Physics 6A/L, and 6B or 6C

### Advanced Requirements

A total of eleven upper-division courses; two must include laboratory or fieldwork.

Three upper-division core courses:

Genetics: BIOL 105  
Ecology: BIOE 107  
Evolution: BIOE 109

One of the following physiology courses:

BIOE 131/L, Animal Physiology/Laboratory  
BIOE 135/L, Plant Physiology/Laboratory

One of the following organism courses:

BIOE 112/L, Ornithology/Ornithology Field Studies  
BIOE 114/L, Herpetology/Field Methods in Herpetological Research  
BIOE 117/L, Systematic Botany of Flowering Plants/Laboratory

BIOE 120/L, Marine Botany/Laboratory  
BIOE 122/L, Invertebrate Zoology/Laboratory  
BIOE 124/L, Mammology/Laboratory  
BIOE 127/L, Ichthyology/Laboratory  
BIOE 129/L, Biology of Marine Mammals/Laboratory  
Microbiology and Environmental Toxicology 119/L,  
Microbiology/Laboratory

### **Elective list for Ecology and Evolution Major**

Three topical electives chosen from the following:

BIOE 108, Marine Ecology  
BIOE 112/L, Ornithology/Laboratory  
BIOE 114/L, Herpetology/Laboratory  
BIOE 117/L, Systematic Botany/Laboratory  
BIOE 118, Plant and Society: The Biology of Food, Shelter, and Medicine  
BIOE 120/L, Marine Botany/Laboratory  
BIOE 122/L, Invertebrate Zoology/Laboratory  
BIOE 124/L, Mammology/Laboratory  
BIOE 127/L, Ichthyology/Laboratory  
BIOE 128L, Large Marine Vertebrates Field Course  
BIOE 129/L, Biology of Marine Mammals/Laboratory  
BIOE 131/L, Animal Physiology/Laboratory  
BIOE 133/L, Exercise Physiology/Laboratory  
BIOE 134/L, Comparative Vertebrate Physiology/Laboratory  
BIOE 135/L, Plant Physiology/Laboratory  
BIOE 137/L, Molecular Ecology/Laboratory  
BIOE 140, Behavioral Ecology  
BIOE 141L, Behavioral Ecology Field Course  
BIOE 145, Plant Ecology  
BIOE 145L, Field Methods in Plant Ecology  
BIOE 147, Community Ecology  
BIOE 148, Quantitative Ecology  
BIOE 149, Disease Ecology  
BIOE 150, Ecological Field Methods  
BIOE 150L, Ecological Field Methods Laboratory  
BIOE 151ABCD, Ecology and Conservation in Practice  
BIOE 155, Freshwater Ecology  
BIOE 155L, Freshwater Ecology Laboratory  
BIOE 158L, Marine Ecology Laboratory  
BIOE 159ABCD, Marine Ecology Field Quarter  
BIOE 161, Kelp Forest Ecology  
BIOE 161L, Kelp Forest Ecology Laboratory  
BIOE 163/L, Ecology of Reefs, Mangroves, and Seagrasses/Laboratory  
BIOE 165, Marine Conservation Biology  
BIOE 172/L, Population Genetics/Laboratory  
BIOE 188, Introduction to Science Writing  
BIOL 100, Biochemistry  
BIOL 101/L, Molecular Biology/Laboratory  
BIOL 110, Cell Biology  
BIOL 115, Eukaryotic Molecular Biology  
BIOL 120, Development

## Biology: Ecology and Evolutionary Biology

Microbiology and Environmental Toxicology 119,  
Microbiology  
Microbiology and Environmental Toxicology 119L,  
Microbiology Laboratory

Ocean Sciences 118, Marine Microbial Ecology

Three general electives chosen from the following:

### **Biological Sciences-EEB**

any upper-division BIOE course

### **Biological Sciences-MCDB**

BIOL 100, Biochemistry

BIOL 101/L, Molecular Biology/Laboratory

BIOL 110, Cell Biology

BIOL 115, Eukaryotic Molecular Biology

BIOL 120, Development

### **Chemistry**

Chemistry 108A, Organic Chemistry

Chemistry 108B, Organic Chemistry

### **Earth Sciences**

Earth Sciences 100/L, Vertebrate Paleontology

Earth Sciences 101/L, Invertebrate

Paleobiology/Laboratory

Earth Sciences 102, Marine Geology

Earth Sciences 105, Coastal Geology

### **Economics**

Economics 166A, Game Theory and Applications I

Economics 166B, Game Theory and Applications II

### **Environmental Studies (enrollment by permission of instructor)**

Environmental Studies 104A, Introduction to  
Environmental Field Methods

Environmental Studies 107ABC, Natural History Field  
Quarter

Environmental Studies 108/L, General  
Entomology/Laboratory

Environmental Studies 115A/L, GIS and Environmental  
Applications/Exercises in GIS

Environmental Studies 120, Conservation Biology

Environmental Studies 122, Tropical Ecology and  
Conservation

Environmental Studies 123, Animal Ecology and  
Conservation

Environmental Studies 129, Integrated Pest  
Management

Environmental Studies 130A/L, Agroecology and  
Sustainable Agriculture/Laboratory

Environmental Studies 130B, Principles of Sustainable  
Agriculture

Environmental Studies 131/L, Insect  
Ecology/Laboratory

Environmental Studies 160, Restoration Ecology

Environmental Studies 161A/L, Soils and Plant  
Nutrition/Laboratory

Environmental Studies 162, Plant Physiological Ecology

Environmental Studies 163/L, Plant Disease

Ecology/Laboratory

Environmental Studies 167, Freshwater and Wetland  
Ecology

Environmental Studies 168, Biochemistry and the  
Global Environment

### **Microbiology and Environmental Toxicology**

Microbiology and Environmental Toxicology 119,  
Microbiology

Microbiology and Environmental Toxicology 119L,  
Microbiology Laboratory

### **Ocean Sciences**

Ocean Sciences 118, Marine Microbial Ecology

Ocean Sciences 130, Biological Oceanography

### **Psychology**

Psychology 123, Behavioral Neuroscience

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,  
183L, 193, 193F, or 195, or 198)

### **Environmental Studies**

Environmental Studies 183, Environmental Studies  
Internship

### **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 courses BIOE 107,  
Ecology, and BIOE 109, Evolution.

### **Ecology and Evolution B.S. Sample Planners**

For freshmen:

<http://undergrad.pbsci.ucsc.edu/eeb/ecevbs/ecev-frosh-plans.html>

For transfer students:

<http://undergrad.pbsci.ucsc.edu/eeb/ecevbs/ecev-transfer-plans.html>

### **Marine Biology Major**

UCSC is situated within five miles of Monterey Bay and its great diversity of coastal marine ecosystems; nature reserves; and state, federal, and private marine research institutions and resource management agencies. These resources, combined with on-campus computing and analytical facilities and the Long Marine Laboratory, make UCSC an exceptional campus for the study of marine biology and its application to coastal

## Biology: Ecology and Evolutionary Biology

conservation and management. Descriptions of nearby environments, institutions, and facilities are available through the Ecology and Evolutionary Biology Department web site at <http://www.eeb.ucsc.edu/>.

The marine biology major is designed to introduce students to marine organisms and the biological and physical processes that affect these organisms, their populations, and their coastal and oceanic ecosystems. The emphasis is on basic principles that help in understanding the processes that shape life in marine environments. The marine biology major is a demanding program that offers a B.S. degree and requires several more courses than the general biology B.A. major.

### MARINE BIOLOGY B.S. MAJOR REQUIREMENTS

#### Introductory Requirements

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Introductory Biology: BIOL 20A, BIOE 20B and 20C

General Chemistry: Chemistry 1A, 1B and 1C/N

Calculus: Mathematics 11A-B or 19A-B

Biostatistics: Applied Mathematics and Statistics 7/L

Physics: Physics 6A/L, and 6B or 6C

#### Advanced Requirements

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A total of 11 upper-division courses; two must include laboratory or fieldwork.

Two core courses:

Genetics: BIOL 105

Evolution: BIOE 109

One ecology course:

BIOE 107, Ecology

BIOE 108, Marine Ecology

One marine-environment course:

Ocean Sciences 101, Marine Environment

Ocean Sciences 130, Biological Oceanography

One marine course:

BIOE 120/L, Marine Botany/Laboratory

BIOE 122/L, Invertebrate Zoology/Laboratory

BIOE 127/L, Ichthyology/Laboratory

BIOE 129/L, Biology of Marine Mammals/Laboratory

Elective list for Marine Biology Major

Three topical electives chosen from the following:

BIOE 108, Marine Ecology

BIOE 120/L, Marine Botany/Laboratory

BIOE 122/L, Invertebrate Zoology/Laboratory

BIOE 127/L, Ichthyology/Laboratory

BIOE 128L, Large Marine Vertebrates Field Course

BIOE 129/L, Biology of Marine Mammals/Laboratory

BIOE 155, Freshwater Ecology

BIOE 155L, Freshwater Ecology Laboratory

BIOE 158L, Marine Ecology Laboratory

BIOE 159ABCD, Marine Ecology Field Quarter

BIOE 161, Kelp Forest Ecology

BIOE 161L, Kelp Forest Ecology Laboratory

BIOE 163/L, Ecology of Reefs, Mangroves, and Seagrasses/Laboratory

BIOE 165, Marine Conservation Biology

BIOE 188, Introduction to Science Writing

EART 102, Marine Geology

EART 105, Coastal Geology

EART 122, Paleoceanography

Ocean Sciences 118, Marine Microbial Ecology

Ocean Sciences 130, Biological Oceanography

Three general electives chosen from the following:

#### **Biological Sciences-EEB**

Any upper-division BIOE course

#### **Biological Sciences-MCDB**

BIOL 100, Biochemistry

BIOL 101/L, Molecular Biology/Laboratory

BIOL 110, Cell Biology

BIOL 115, Eukaryotic Molecular Biology

BIOL 120, Development

#### **Chemistry**

Chemistry 108A, Organic Chemistry

Chemistry 108B, Organic Chemistry

#### **Earth Sciences**

Earth Sciences 100/L, Vertebrate Paleontology

Earth Sciences 101/L, Invertebrate

Paleobiology/Laboratory

Earth Sciences 102, Marine Geology

Earth Sciences 105, Coastal Geology

#### **Economics**

Economics 166A, Game Theory and Applications I

Economics 166B, Game Theory and Applications II

#### **Environmental Studies (enrollment by permission of instructor)**

Environmental Studies 104A, Introduction to

Environmental Field Methods

Environmental Studies 107ABC, Natural History Field Quarter

Environmental Studies 108/L, General

Entomology/Laboratory

Environmental Studies 115A/L, GIS and Environmental Applications/Exercises in GIS

Environmental Studies 120, Conservation Biology

Environmental Studies 122, Tropical Ecology and Conservation

Environmental Studies 123, Animal Ecology and Conservation

Environmental Studies 129, Integrated Pest Management

## Biology: Ecology and Evolutionary Biology

Environmental Studies 130A/L, Agroecology and Sustainable Agriculture/Laboratory  
Environmental Studies 130B, Principles of Sustainable Agriculture  
Environmental Studies 131/L, Insect Ecology/Laboratory  
Environmental Studies 160, Restoration Ecology  
Environmental Studies 161A/L, Soils and Plant Nutrition/Laboratory  
Environmental Studies 162, Plant Physiological Ecology  
Environmental Studies 163/L, Plant Disease Ecology/Laboratory  
Environmental Studies 167, Freshwater and Wetland Ecology  
Environmental Studies 168, Biochemistry and the Global Environment

### **Microbiology and Environmental Toxicology**

Microbiology and Environmental Toxicology 119, Microbiology  
Microbiology and Environmental Toxicology 119L, Microbiology Laboratory

### **Ocean Sciences**

Ocean Sciences 118, Marine Microbial Ecology  
Ocean Sciences 130, Biological Oceanography

### **Psychology**

Psychology 123, Behavioral Neuroscience  
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, 183L, 193, 193F, or 195, or 198)

### **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 courses BIOE 107 Ecology, or BIOE 108 Marine Ecology, or BIOE 159A Marine Ecology Field Quarter: Marine Ecology with Laboratory, and BIOE 109 Evolution.

### **Marine Biology B.S. Sample Planners**

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For freshmen:

<http://undergrad.pbsci.ucsc.edu/eeb/mabibs/mabibs-frosh-plans.html>

For transfer students:

<http://undergrad.pbsci.ucsc.edu/eeb/mabibs/mabibs-transfer-plans.html>

### **PLANT SCIENCES MAJOR**

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UCSC has a strong program in the plant sciences (sometimes called botany). A fine natural environment,

the campus Arboretum, the facilities under the Center for Agroecology and Sustainable Food Systems (especially the Farm and Garden), and an excellent greenhouse collection all enhance the resources that support UCSC's botanical programs.

The plant sciences major is designed for students with an interest in plant biology and its associated curricular fields such as plant ecology, plant physiology, plant pathology, plant molecular biology, soils, and applied plant sciences. After completion of the core courses, students can proceed in one of several directions depending on their interest. For example, a more in-depth study of physiology and molecular biology courses can serve as preparation for work in the biotechnology field or for graduate school; further studies in plant ecology, tropical ecology, or restoration ecology can lead to careers such as resource ecologist or naturalist or to the pursuit of related fields in graduate school; upper-division training in agroecology can lead to careers in agriculture or food systems. There are many opportunities for internships both on the UCSC campus and in the community at large.

### **PLANT SCIENCES B.S. MAJOR REQUIREMENTS**

#### **Introductory Requirements**

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Introductory Biology: BIOL 20A, BIOE 20B and 20C  
General Chemistry: Chemistry 1A, 1B and 1C/N  
Calculus: Mathematics 11A-B or 19A-B  
Biostatistics: Applied Mathematics and Statistics 7/L  
Physics: Physics 6A/L, and 6B or 6C

#### **Advanced Requirements**

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A total of 11 upper-division courses; two of which must include laboratory or fieldwork.

Three core courses:

Genetics: BIOL 105  
Ecology: BIOE 107  
Evolution: BIOE 109

One plant physiology course from the following:

BIOE 135/L, Plant Physiology/Laboratory  
Environmental Studies 162, Plant Physiological Ecology

One botany course from the following:

BIOE 117/L, Systematic Botany/Laboratory  
BIOE 120/L, Marine Botany/Laboratory

Elective list for Plant Sciences Major

Three topical electives chosen from the following:

#### **Biological Sciences-EEB**

BIOE 117/L, Systematic Botany/Laboratory  
BIOE 118, Plant and Society: The Biology of Food, Shelter, and Medicine  
BIOE 120/L, Marine Botany/Laboratory

## Biology: Ecology and Evolutionary Biology

BIOE 135/L, Plant Physiology/Laboratory  
BIOE 137/L, Molecular Ecology/Laboratory  
BIOE 145, Plant Ecology  
BIOE 145L, Field Methods in Plant Ecology  
BIOE 148, Quantitative Ecology  
BIOE 149, Disease Ecology  
BIOE 151ABCD, Ecology and Conservation in Practice  
BIOE 188, Introduction to Science Writing

### **Biological Sciences-MCDB**

BIOL 100, Biochemistry  
BIOL 101/L, Molecular Biology/Laboratory  
BIOL 110, Cell Biology  
BIOL 115, Eukaryotic Molecular Biology

### **Environmental Studies (enrollment by permission of instructor)**

Environmental Studies 104A, Introduction to Environmental Field Methods  
Environmental Studies 129, Integrated Pest Management  
Environmental Studies 130A/L, Agroecology and Sustainable Agriculture/Laboratory  
Environmental Studies 130B, Principles of Sustainable Agriculture  
Environmental Studies 131/L, Insect Ecology/Laboratory  
Environmental Studies 160, Restoration Ecology  
Environmental Studies 161A/L, Soils and Plant Nutrition/Laboratory  
Environmental Studies 162, Plant Physiological Ecology  
Environmental Studies 163/L, Plant Disease Ecology/Laboratory

Three general electives chosen from the following:

### **Biological Sciences-EEB**

Any upper-division BIOE course

### **Biological Sciences-MCDB**

BIOL 100, Biochemistry  
BIOL 101/L, Molecular Biology/Laboratory  
BIOL 110, Cell Biology  
BIOL 115, Eukaryotic Molecular Biology  
BIOL 120, Development

### **Chemistry**

Chemistry 108A, Organic Chemistry  
Chemistry 108B, Organic Chemistry

### **Earth Sciences**

Earth Sciences 100/L, Vertebrate Paleontology  
Earth Sciences 101/L, Invertebrate Paleobiology/Laboratory  
Earth Sciences 102, Marine Geology  
Earth Sciences 105, Coastal Geology

### **Economics**

Economics 166A, Game Theory and Applications I  
Economics 166B, Game Theory and Applications II

### **Environmental Studies (enrollment by permission of instructor)**

Environmental Studies 104A, Introduction to Environmental Field Methods  
Environmental Studies 107ABC, Natural History Field Quarter  
Environmental Studies 108/L, General Entomology/Laboratory  
Environmental Studies 115A/L, GIS and Environmental Applications/Exercises in GIS  
Environmental Studies 120, Conservation Biology  
Environmental Studies 122, Tropical Ecology and Conservation  
Environmental Studies 123, Animal Ecology and Conservation  
Environmental Studies 129, Integrated Pest Management  
Environmental Studies 130A/L, Agroecology and Sustainable Agriculture/Laboratory  
Environmental Studies 130B, Principles of Sustainable Agriculture  
Environmental Studies 131/L, Insect Ecology/Laboratory  
Environmental Studies 160, Restoration Ecology  
Environmental Studies 161A/L, Soils and Plant Nutrition/Laboratory  
Environmental Studies 162, Plant Physiological Ecology  
Environmental Studies 163/L, Plant Disease Ecology/Laboratory  
Environmental Studies 167, Freshwater and Wetland Ecology  
Environmental Studies 168, Biochemistry and the Global Environment

### **Microbiology and Environmental Toxicology**

Microbiology and Environmental Toxicology 119, Microbiology  
Microbiology and Environmental Toxicology 119L, Microbiology Laboratory

### **Ocean Sciences**

Ocean Sciences 118, Marine Microbial Ecology  
Ocean Sciences 130, Biological Oceanography

### **Psychology**

Psychology 123, Behavioral Neuroscience

One of the following may also be used as an upper-division general elective:

## Biology: Ecology and Evolutionary Biology

### Biological Sciences-EEB

Any 5 credits of undergraduate research (BIOE 183W, 183L, 193, 193F, or 195, or 198)

### Environmental Studies

Environmental Studies 183, Environmental Studies Internship

### Disciplinary Communication (DC) Requirement

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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 courses BIOE 107, Ecology, and BIOE 109, Evolution.

### Plant Sciences B.S. Sample Planners

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For freshmen:

<http://undergrad.pbsci.ucsc.edu/eeb/plntbs/plntbs-frosh-plans.html>

For transfer students:

<http://undergrad.pbsci.ucsc.edu/eeb/plntbs/plntbs-transfer-plans.html>

### Comprehensive Requirement

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All majors in the biological sciences require a comprehensive requirement. This requirement can be satisfied in one of the following ways:

by passing course 190, Senior Seminar;

by receiving a passing grade in an internship, independent research laboratory, or field course:

BIOE 114L, Field Methods in Herpetological Research

BIOE 128L, Large Marine Vertebrates Field Course

BIOE 141L, Behavioral Ecology Field Course

BIOE 145L, Field Methods in Plant Ecology

BIOE 150L, Ecological Field Methods

BIOE 151, Ecology and Conservation in Practice

BIOE 155L, Freshwater Ecology Laboratory

BIOE 158L, Marine Ecology Laboratory

BIOE 159, Marine Ecology Field Quarter

BIOE 161L, Kelp Forest Ecology Laboratory

BIOE 183, Undergraduate Research in EEB

BIOE 188, Introduction to Science Writing

BIOL 100L, Biochemistry Laboratory

BIOL 105L, Eukaryotic Genetics Laboratory

BIOL 105M, Microbial Genetics Laboratory

BIOL 109L, Yeast Molecular Genetics Laboratory

BIOL 110L, Cell Biology Laboratory

BIOL 111L, Immunology Laboratory

BIOL 115L, Eukaryotic Molecular Biology Laboratory

BIOL 120L, Developmental Biology Laboratory

BIOL 121L, Environmental Phage Biology Laboratory

BIOL 178L, Protocols in Stem Cell Biology

BIOL 186L, Undergraduate Research in MCD Biology

BIOL 186R, Undergraduate Research in MCD Biology

BIOL 187L, Molecular Biotechnology Laboratory

BIOL 189, Health Sciences Internship

Biochemistry and Molecular Biology 110L, Advanced

Biochemistry Laboratory

Microbiology and Environmental Toxicology 119L,

Microbiology Laboratory

by completing a senior thesis;

by 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 biological sciences advising office before the last day of the graduating quarter;

by obtaining an 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 biological sciences advising office before the last day of the graduating quarter.

### HONORS

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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.

### COURSE SUBSTITUTION/TRANSFER CREDIT POLICY

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At least half of the upper-division courses (numbered 100–190) required for each major must be taken through the biological sciences program at UCSC, not as transfer credits from another department or institution. Transfer students are advised to contact the Physical and Biological Sciences Undergraduate Affairs office before enrolling in numerous upper-division courses at other institutions. For more information on transferring courses to UCSC, please consult the undergraduate web site at:

<http://undergrad.pbsci.ucsc.edu/biology/transfer-students/index.html>.

A maximum of one upper-division course requirement may be met with a research-based independent study or graduate-level UCSC biology course or a course offered by another UCSC department.

### ACADEMIC ADVISING

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Academic advising is available at the Physical and Biological Sciences Undergraduate Affairs office. Students should take full advantage of this opportunity and should keep in frequent touch with the office to stay informed about late announcements of courses,

## Biology: Ecology and Evolutionary Biology

changes in scheduling, and opportunities for special study.

The undergraduate web site

(<http://undergrad.pbsci.ucsc.edu/eeb/index.html>) serves as the program handbook containing advice and information pertinent to students' most frequently voiced questions. Each student in the major should review the information posted on the web site; for further assistance, contact an academic adviser.

### EDUCATION ABROAD OPPORTUNITIES

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The UC Education Abroad Program (EAP) offers qualified students unique opportunities to broaden their educational horizons. The EEB 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.

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, offers a homestay program, and carries credit for two upper-division biology courses. 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 basic science requirements, including chemistry, mathematics, and introductory biology and must declare their major prior to applying to go abroad. Visit the EAP office as soon as possible to begin planning; you must seek advice about your EAP plan for major courses at UCSC from the biological sciences undergraduate adviser and/or faculty advisor and receive their approval for your plans.

### Graduate Program Description

The Ecology and Evolutionary Biology (EEB, courses BIOE) Graduate Program at UCSC 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 small size of 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 Ecology and Evolutionary Biology (EEB) at UC Santa Cruz is one of the premier EEB programs in the country. EEB-UCSC graduate students regularly win prestigious awards for their presentations at international meetings and publish their work in the best journals of their fields. In addition to taking 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, and around the Pacific Rim.

Research in EEB comprises four core tracks

Ecology

Evolutionary biology

Physiology

Behavior

### DEGREE REQUIREMENTS

#### Core Courses:

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BIOE 200A, Scientific Skills

BIOE 200B, Advanced Organismal Biology

BIOE 279, Evolutionary Ecology

BIOE 293, Readings in Ecology and Evolution (orequivalent)

BIOE 294, Ecology, Evolutionary Biology Seminar (taken each quarter when in residence)

BIOE 295, Advanced Ecology and Evolutionary Biology Seminar (may substitute for BIOE 293)

#### Ph.D. Requirements

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Ph.D. students must take BIOE 200A and 200B in the fall of the first year, and BIOE 279 in the winter of the first year. Two quarters of BIOE 293 are taken in the winter and spring of the first year. In addition, two quarters of BIOE 295 or two additional quarters of BIOE 293 should be completed by the end of the year two. Biology 281, 294, and 297/299 (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, absentia or leave of absence status.

Each Ph.D. student should expect to complete at least two quarters as a teaching assistant during their graduate career.

## Biology: Ecology and Evolutionary Biology

During fall of the second year, students take a comprehensive examination. 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, physiology, behavior, organismal, and general biology.

Later in the second or third year, the student submits a dissertation research proposal to the proposal committee and must defend it in an oral examination, followed by a seminar on his/her proposed research. The student advances to candidacy only after having completed all coursework, the comprehensive examination, the proposal defense, and the proposal seminar.

No sooner than 30 days after submitting the dissertation to a dissertation reading committee, the student defends the dissertation to the committee, followed by a public seminar. At least one chapter of the dissertation must be submitted to a refereed journal for publication before receipt of the Ph.D.

### Master of Arts (M.A.) Requirements

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M.A. students must take BIOE 200A, BIOE 200B, BIOE 279, and two quarters of BIOE 293 (or one quarter of 293 and one quarter of 295) within their first two years. Biology 281, 294, and 297/299 (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, absentia or leave of absence status. The minimum number of credits for the master's degree is 35 of which no more than 15 credits from upper-division undergraduate courses may be used as part the student's coursework.

Thirty days after submitting the master's thesis to a thesis reading committee, the student defends the thesis to the committee, followed by a public seminar.

### REQUIREMENTS FOR THE ECOLOGY AND EVOLUTIONARY BIOLOGY DESIGNATED EMPHASIS

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To receive a parenthetical notation in Ecology and Evolutionary Biology (hereafter EEB), graduate

students must complete the following requirements, in addition to the degree requirements for the doctorate in their home department:

1. Take the following EEB core courses (required for all EEB graduate students):
2. BIOE 279 Evolutionary Ecology (5 credits), BIOE 200A Scientific Skills (5 credits), BIOE 200B Advanced Organismal Biology (5 credits)
3. 2. Attend EEB department seminars (enroll in BIOE 294, 2 credits) for one quarter
4. 3. Attend a lab group seminar course (enroll in BIOE 281, 2/5 credits) for one quarter
5. 4. Take at least two courses from any other graduate or appropriate upper-division courses in biology, for example:
6. BIOE 293 Readings in Ecology and Evolution (2 credits) BIOE 295 Special Advanced Topics in Ecology and Evolution (2 credits) BIOE 272 Exercise Physiology (5 credits) BIOE 233 Exercise Physiology (5 credits) BIOE 148 Quantitative Ecology for Conservation (5 credits) BIOE 252 Community Ecology (5 credits) BIOE 208 Marine Ecology (5 credits) BIOE 245 Plant Ecology (5 credits) BIOE 274 Evolutionary Game Theory (5 credits) BIOE 286 Experimental Design and Data Analysis (5 credits)
7. 5. In all, students will be expected to complete at least 20 credits of EEB coursework. Courses taken to fulfill graduate requirements within the home department will not count toward the Designated Emphasis requirements.
8. 6. Have a designated graduate adviser from among the faculty of the EEB department, who commits to serve on the qualifying exam committee and on the Ph.D. dissertation reading committee.

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## ECOLOGY AND EVOLUTIONARY BIOLOGY FACULTY AND PROFESSIONAL INTERESTS

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### **Suzanne Alonzo**

Sexual selection, social behavior and the evolution and ecology of reproduction

### **Giacomo Bernardi**

Fish biology, phylogenetics, evolution

### **Mark H. Carr**

Marine ecology, applied marine ecology

### **Daniel P. Costa**

Physiological ecology of marine mammals and birds

### **Donald Croll**

Ecology and conservation of islands and seabirds

**Jim Estes**

Marine sciences, community ecology, species interactions

**Laurel R. Fox**

Terrestrial population and community ecology, plant-animal interactions

**Kathleen M. Kay**

Plant evolutionary ecology

**A. Marm Kilpatrick**

Disease ecology, population biology

**Kristy Kroeker**

Global change biology, community ecology, applied marine ecology, climate change, ocean acidification, multiple stressors

**Bruce E. Lyon**

Behavioral ecology, evolutionary ecology, avian ecology

**Rita Mehta**

Comparative marine physiology

**Eric P. Palkovacs**

Freshwater ecology, eco-evolutionary dynamics, fisheries and fish ecology

**Ingrid M. Parker**

Plant ecology, plant-pathogen interactions, biological invasions

**Jarmila Pittermann**

Plant physiology

**Grant H. Pogson**

Molecular population genetics, ecological genetics, marine invertebrates and fishes

**Donald C. Potts**

Coral reef ecology, genetics, evolution, and geological history; marine biodiversity; tropical biology, global change, and remote sensing

**Peter T. Raimondi**

Marine ecology, evolutionary ecology, experimental design, applied ecology

**Beth Shapiro**

Evolutionary and molecular ecology, ancient DNA, genomics, pathogen evolution

**Barry Sinervo**

Animal behavior, evolution, physiological ecology

**John N. Thompson**

Coevolution, evolutionary ecology and genetics of species interactions, organization of biodiversity

**Terrie M. Williams**

Large mammal physiology, bioenergetics, exercise and environmental physiology

ECOLOGY AND EVOLUTIONARY BIOLOGY  
EMERITUS FACULTY

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**William Jackson Davis**

**William Doyle**

**Lynda J. Goff**

**Ralph Hinegardner**

**Jean Langenheim**

**Burney LeBoeuf**

**Charles (Leo) Ortiz**

**A. Todd Newberry**

**John Pearse**

**Ecology and Evolutionary Biology Lecturers**

**Robin Dunkin**

**Baldo Marinovic**



ADJUNCTS

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**Catherine Burns** (Environmental Studies)

Conservation biology, mammals, birds, population and community ecology

**Claudio Campagna** (Ecology and Evolutionary Biology)

Marine conservation; species conservation, philosophical aspects of nature conservation

**James Estes** (Ecology and Evolutionary Biology)

Marine sciences, community ecology, species interactions

**Samantha Forde** (Ecology and Evolutionary Biology;

Gordon and Betty Moore Foundation)

Experimental evolutionary ecology

**Winifred Frick** (Ecology and Evolutionary Biology)

Population ecology, conservation biology, ecology and behavior of bats

**Steven Haddock** (Ecology and Evolutionary Biology; MBARI)

Bioluminescence, biodiversity and molecular phylogenetics of deep-sea and open ocean gelatinous zooplankton

**Elliott Hazen** (NOAA/NMFS/SWFSC; Adjunct Faculty, Duke University Marine Lab)

Marine ecology, birds and mammals, conservation biology: focusing on predator-prey dynamics and their response to environmental variability and global change

**Joseph Merz** (Ecology and Evolutionary Biology; Cramer Fish Sciences)

Relationships between aquatic species and their environments and the effects of anthropogenic influences on those relationships.

## Biology: Ecology and Evolutionary Biology

**Stephan B. Munch** (NOAA Southwest Fisheries Science Center, Stony Brook University)

Population and ecosystem dynamics, contemporary evolution of life histories, transgenerational thermal plasticity

**Devon Pearse** (Ecology and Evolutionary Biology; NOAA Fisheries Service's; Southwest Fisheries Science Center)

Evolutionary and ecological genetics, conservation biology

**Luiz Rocha** (California Academy of Sciences)

Fish ecology, systematics and evolution

**Bernie Tershy** (Ecology and Evolutionary Biology)

Ecology and conservation of seabirds and island ecosystems

**M. Tim Tinker** (Ecology and Evolutionary Biology;

Western Ecological Research Center, USGS)

Foraging ecology and demography of the southern sea otter

**Kerstin Wasson** (Ecology and Evolutionary Biology;

Elkhorn Slough National Estuarine Research Reserve)

Evolutionary ecology, invasion biology, conservation science

### AFFILIATES

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**Greg Gilbert** (Environmental Studies)

Disease ecology, conservation biology, tropical forest ecology, microbial ecology

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**Karen D. Holl** (Environmental Studies)

Restoration ecology, conservation biology, landscape ecology

**Paul L. Koch** (Earth Sciences)

Isotope biogeochemistry, vertebrate paleontology

**Raphael Kudela** (Ocean Sciences)

Ecological modeling and remote sensing, satellite oceanography, phytoplankton ecology and harmful algal blooms

**Marc Mangel** (Applied Mathematics and Statistics)

Mathematical modeling of biological phenomena, especially the evolutionary ecology of growth, aging, and longevity; quantitative issues in fishery management; mathematical and computational aspects of disease

**Christopher Wilmers** (Environmental Studies)

Population and community ecology; wildlife conservation; predator-prey dynamics; climate change impacts on biodiversity.

**Jonathan Zehr** (Ocean Sciences)

Aquatic microbial ecology, biological oceanography

### DEPARTMENTAL AFFILIATED RESEARCHERS

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**Kristen Ruegg**

Evolutionary biology and conservation genetics

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## ECOLOGY AND EVOLUTIONARY BIOLOGY COURSES

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### LOWER-DIVISION COURSES

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#### **20B. Development and Physiology. F,W,S**

Topics in morphology, physiology, development, genetics, and endocrinology selected to exemplify current issues and perspectives in organismic biology. Prerequisite(s): BIOL 20A. R. Dunkin

#### **20C. Ecology and Evolution. F,W,S**

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. B. Marinovic

#### **75. Scientific Diving Certification (2 credits). F,S**

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. Enrollment limited to 16. S. Clabuesch

#### **80S. Lies, Damn Lies, and Statistics. \***

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

## Biology: Ecology and Evolutionary Biology

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. (General Education Code(s): SR.) P. Raimondi

### **82. Introduction to Field Research and Conservation (2 credits). F**

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. Enrollment limited to 28. G. Dayton, D. Croll

### **85. Natural History of the UCSC Natural Reserves. S**

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). (General Education Code(s): PE-E.) The Staff

### **95. Seymour Center Docent Training (2 credits). W**

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 by application and interview. (General Education Code(s): PR-S.) P. Raimondi

### **99. Tutorial. F,W,S**

Individual, directed study for undergraduates. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## UPPER-DIVISION COURSES

### **107. Ecology. W,S**

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(s): satisfaction of the Entry Level Writing and Composition requirements; BIOL 20A, BIOE 20B, and BIOE 20C. (W) B. Lyon, (S) J. Estes

### **108. Marine Ecology. W**

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 course 208. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; BIOL 20A, BIOE 20B, and BIOE 20C; BIOE 107 or 140 recommended. Enrollment restricted to juniors and seniors. P. Raimondi, K. Kroeker

### **109. Evolution. F,W,S**

An examination of the history and mechanisms of evolutionary change. Topics include molecular evolution, natural and sexual selection, adaptation, speciation, biogeography, and macroevolution. Prerequisite(s): satisfaction of the

Entry Level Writing and Composition requirements; BIOL 20A, BIOE 20B, BIOE 20C, and BIOL 105. (F) G. Bernardi, (W) S. Alonzo, (S) G. Pogson

### **112. Ornithology. F**

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(s): BIOE 107, BIOE 109, or BIOE 140. Concurrent enrollment in BIOE 112L is required. B. Lyon

### **112L. Ornithology Field Studies (2 credits). F**

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. Students are billed a materials fee. Some field trips may require students to provide their own transportation. Prerequisite(s): BIOE 107, BIOE 109, or BIOE 140. Concurrent enrollment in BIOE 112 is required. Offered in alternate academic years. B. Lyon

### **114. Herpetology. S**

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(s): BIOE 107, BIOE 109, BIOE 110, or BIOE 140. Concurrent enrollment in BIOE 114L required. Offered in alternate academic years. B. Sinervo

**114L. Field Methods in Herpetological Research (2 credits). S**

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(s): BIOE 107, 109, 110, or 140. Concurrent enrollment in BIOE 114 is required. Offered in alternate academic years. B. Sinervo

**117. Systematic Botany of Flowering Plants. W**

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(s): BIOL 20A, BIOE 20B, and BIOE 20C. Must be taken concurrently with BIOE 117L. K. Kay

**117L. Systematic Botany of Flowering Plants Laboratory (2 credits). W**

Weekly laboratory concerned primarily with California flora and plant families. Several field trips. Students are billed a materials fee. Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C. Must be taken concurrently with BIOE 117. K. Kay

**118. Plants and Society: the Biology of Food, Shelter, and Medicine. S**

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(s): BIOL 20A and BIOE 20B; and BIOE 20C or ENVS 23 and ENVS 24 J. Pittermann

**120. Marine Botany. S**

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(s): BIOL 20A, BIOE 20B, and BIOE 20C. Must be taken concurrently with BIOE 120L. The Staff

**120L. Marine Botany Laboratory (2 credits). S**

One laboratory weekly and several field trips. Focuses on marine algae, fungi, and angiosperms. Students are billed a materials fee. Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C. Must be taken concurrently with BIOE 120. The Staff

**122. Invertebrate Zoology. W**

An examination of invertebrates and their habitats. Lecture format. Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C. BIOE 122L must be taken concurrently. B. Marinovic

**122L. Invertebrate Zoology Laboratory (2 credits). W**

An examination of invertebrates and their habitats. Weekly laboratories or field trips. Students are billed a materials fee. Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C. BIOE 122 must be taken concurrently. B. Marinovic

**124. Mammalogy. F**

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(s): BIOL 20A; and BIOE 20B and 20C. Concurrent enrollment in course 124L is required. The Staff

**124L. Mammalogy Laboratory (2 credits). F**

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(s): BIOL 20A; and BIOE 20B and 20C. Concurrent enrollment in course 124 is required. The Staff

**127. Ichthyology. F**

An introduction to the biology of jawless, cartilaginous, and bony fishes—their classification, evolution, form, physiology, and ecology. Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C. BIOE 127L must be taken concurrently. Offered in alternate academic years. G. Bernardi

**127L. Ichthyology Laboratory (2 credits). F**

One laboratory session a week and several field trips to study the biology of fish. Students are billed a materials fee. Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C. BIOE 127 must be taken concurrently. Offered in alternate academic years. G. Bernardi

**128L. Large Marine Vertebrates Field Course. S**

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. Prerequisite(s): BIOL 20A and BIOE 20B and BIOE 20C. Students are billed a materials fee. Enrollment limited to 24. P. Robinson

**129. Biology of Marine Mammals. S**

A survey of cetaceans, pinnipeds, sirenians, and sea otters, including natural history, systematics, physiology, behavior, anatomy, and conservation. Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C; BIOL 110 is recommended. D. Costa

**129L. Biology of Marine Mammals Laboratory (2 credits). S**

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. Students are billed a materials fee. Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C. Must be taken concurrently with BIOE 129. D. Costa

**131. Animal Physiology. W**

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(s): BIOL

20A, BIOE 20B, and BIOE 20C. R. Mehta, T. Williams

**131L. Animal Physiology Laboratory (2 credits). W**

Experiments conducted with primary focus on quantitative physiological principles of organ systems and intact organisms. Students cannot receive credit for this course and course 130L. Students are billed a materials fee. Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C. Concurrent enrollment in BIOE 131 is required. R. Mehta, T. Williams

**133. Exercise Physiology. S**

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(s): BIOL 20A, BIOE 20B and 20C. BIOE 131 recommended. Concurrent enrollment in BIOE 133L required. Offered in alternate academic years. T. Williams

**133L. Exercise Physiology Laboratory (2 credits). S**

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. Students are billed a materials fee. Prerequisite(s): BIOL 20A, and BIOE 20B and 20C. BIOE 131 recommended. Concurrent enrollment in BIOE 133 is required. Offered in alternate academic years.

T. Williams

**134. Comparative Vertebrate Anatomy. F**

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(s): BIOL 20A and BIOE 20B and BIOE 20C. Concurrent enrollment in BIOE 134L is required. R. Mehta

**134L. Comparative Vertebrate Anatomy Laboratory (2 credits). F**

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. Students are billed for a materials fee. Prerequisite(s): BIOL 20A and BIOE 20B and BIOE 20C. Concurrent enrollment in BIOE 134 is required. R. Mehta

**135. Plant Physiology. W**

Cellular and organismal functions important in the life of green plants. Prerequisite(s): BIOL 20A and BIOE 20B and 20C; concurrent enrollment in course 135L is required. J. Pittermann

**135L. Plant Physiology Laboratory (2 credits). W**

Weekly laboratory concerning the cellular and organismal functions of green plants. Students are billed a

## Biology: Ecology and Evolutionary Biology

materials fee. Prerequisite(s): BIOL 20A and BIOE 20B and BIOE 20C; concurrent enrollment in course 135. J. Pittermann

### **137. Molecular Ecology. W**

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(s): courses 20B and 20C and BIOL 20A and BIOL105 Concurrent enrollment in course 137L is required. Enrollment limited to 24. B. Shapiro

### **137L. Molecular Ecology Laboratory (2 credits). W**

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(s): courses 20B and 20C and BIOL 20A and BIOL105. Concurrent enrollment in course 137 is required. Enrollment limited to 24. B. Shapiro

### **140. Behavioral Ecology. F**

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(s): BIOL 20A,

BIOE 20B, and BIOE 20C. B. Sinervo

### **141L. Behavioral Ecology Field Course. \***

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. Students are billed a materials fee. Prerequisite(s): BIOE 107 or BIOE 140 or BIOE 110; satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 25. Offered in alternate academic years. (General Education Code(s): W.) B. Sinervo, B. Lyon

### **145. Plant Ecology. F**

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 course 245. Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C. BIOE 107 is recommended. The Staff

### **145L. Field Methods in Plant Ecology. \***

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 course 245L. Students are billed a materials fee. Prerequisite(s):

satisfaction of the Entry Level Writing and Composition requirements; BIOL 20A, BIOE 20B, and BIOE 20C. Concurrent enrollment in BIOE 145 is required. BIOE 107 is recommended. (General Education Code(s): W.) I. Parker

### **147. Community Ecology. S**

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 course 247. Prerequisite(s): BIOE 107, 108, 145, 155 or 159A; or Environmental Studies 24 by permission of instructor. The Staff

### **148. Quantitative Ecology. F**

Quantitative treatment of the central concepts and applications of theoretical ecology. Emphasis on the mathematical modeling of single populations and species interactions, and the integration of models with data. Topics include stochastic and deterministic processes of extinction; discrete- and continuous-time models of growth and population viability analysis relevant to small and harvested populations; numeric and analytical investigations of dynamics and stability; introduction to model-fitting in information theoretic framework using R and/or MATLAB. Prerequisite(s): BIOE 107. A. Kilpatrick, M. Tinker

### **149. Disease Ecology. \***

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

## Biology: Ecology and Evolutionary Biology

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(s): BIOL 20A, and BIOE 20B and 20C and 107. A. Kilpatrick

**150. Ecological Field Methods. \*** 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 Environmental Studies 104A. Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C; concurrent enrollment in BIOE 150L is required. BIOE 107, 108, 140, or 147 recommended. Enrollment limited to 25. D. Croll

**150L. Ecological Field Methods Laboratory. \*** 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(s): BIOL 20A, BIOE 20B, and BIOE 20C; concurrent enrollment in BIOE 150 is required. BIOE 107, 108, 140, or 147 recommended. Enrollment limited to 25. (General Education Code(s): W.) D. Croll

**151A. Ecology and Conservation in Practice Supercourse: Ecological Field Methods. S** An intensive, on-site learning experience in terrestrial field ecology and conservation, using the University of California Natural Reserves. 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. Lectures, field experiments, and computer exercises familiarize students with research methods, study design, statistical approaches, and analytical tools for ecological research. Enrollment by application. Prerequisite(s): BIOL 20A, BIOE 20B, BIOE 20C or ENVS 23, 24, 100; and AMS 7 and 7L. Concurrent enrollment in BIOE 151B-C-D or ENVS 109B-C-D 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, 150L, ENVS 104A or 196A. (Also offered as Environmental Studies 109A. Students cannot receive credit for both courses.) D. Croll, G. Dayton

**151B. Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory. S** 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 by application. Prerequisite(s): Entry Level Writing and Composition requirements; BIOL 20A, BIOE 20B, BIOE 20C or ENVS 23, 24, 100; and AMS 7 and 7L. Concurrent enrollment in BIOE 151A-C-D or ENVS 109A-C-D 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, 150L, ENVS 104A or

196A. (Also offered as Environmental Studies 109B. Students cannot receive credit for both courses.) (General Education Code(s): W.) D. Croll, G. Dayton

**151C. Ecology and Conservation in Practice Supercourse: Functions and Processes of Terrestrial Ecosystems. S** 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 by application. Prerequisite(s): BIOL 20A, BIOE 20B, BIOE 20C or ENVS 23, 24, 100; and AMS 7 and 7L. Concurrent enrollment in BIOE 151A-B-D or ENVS 109A-B-D 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, 150L, ENVS 104A or 196A. (Also offered as Environmental Studies 109C. Students cannot receive credit for both courses.) D. Croll, G. Dayton

**151D. Ecology and Conservation in Practice Supercourse: Conservation in Practice. S** 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

## Biology: Ecology and Evolutionary Biology

and resource management.

Enrollment by application.

Prerequisite(s): BIOL 20A, BIOE 20B, BIOE 20C or ENVS 23, 24, 100; and AMS 7 and 7L. Concurrent enrollment in BIOE 151A-B-C or ENVS 109A-B-C 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, 150L, ENVS 104A or 196A. (Also offered as Environmental Studies 109D. Students cannot receive credit for both courses.) D. Croll, G. Dayton

### **155. Freshwater Ecology. F**

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(s): BIOL 20A, BIOE 20B, and BIOE 20C. E. Palkovacs

### **155L. Freshwater Ecology Laboratory. S**

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(s): BIOL 20A, BIOE 20B, BIOE 20C and BIOE 155.

Enrollment limited to 24. E. Palkovacs

### **158L. Marine Ecology Laboratory. S**

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. Students are billed a materials fee.

Prerequisite(s): BIOE 108; satisfaction of the Entry Level Writing and Composition requirements. Offered in alternate academic years. (General Education Code(s): W.) P. Raimondi, K. Kroeker

### **159A. Marine Ecology Field Quarter: Marine Ecology with Laboratory. \***

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.

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, 159B, 159C, and 159D are equivalent to BIOE 127, 127L, 108, and 158L for major requirements. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; BIOE 159A, 159B, 159C, and 159D must be taken concurrently. Enrollment limited to 26. Offered in alternate academic years. (General Education Code(s): W.) P. Raimondi, G. Bernardi

### **159B. Marine Ecology Field Quarter: Ichthyology with Laboratory. \***

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, 159B, 159C, and 159D are equivalent to BIOE 127, 127L, 108, and 158L for major requirements. BIOE 159A, 159B, 159C, and 159D must be taken concurrently. Enrollment limited to 26. Offered in alternate academic years. P. Raimondi, G. Bernardi

### **159C. Marine Ecology Field Quarter: Methods in Field Ecology. \***

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 course 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, 159B, 159C, and 159D are equivalent to BIOE 127, 127L, 108, and 158L for major requirements. BIOE 159A, 159B, 159C, and 159D must be taken

concurrently. Enrollment limited to 26. Offered in alternate academic years. P. Raimondi, G. Bernardi

**159D. Marine Ecology Field Quarter: Methods in Field Ecology Laboratory. \***

This is laboratory portion of course 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 course 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, 159B, 159C, and 159D are equivalent to BIOE 127, 127L, 108, and 158L for major requirements. BIOE 159A, 159B, 159C, and 159D must be taken concurrently. Enrollment limited to 26. Offered in alternate academic years. P. Raimondi, G. Bernardi

**161. Kelp Forest Ecology. F**

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 restricted to seniors. BIOE 161L must be taken concurrently; BIOE 107, 120/L, 122/L are recommended. Enrollment limited to 24. Offered in alternate academic years. M. Carr, P. Raimondi

**161L. Kelp Forest Ecology Laboratory. F**

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). Enrollment limited to 24. Offered in alternate academic years. (General Education Code(s): W.) M. Carr, P. Raimondi

**163. Ecology of Reefs, Mangroves, and Seagrasses. \***

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(s): BIOL 20A, BIOE 20B, and BIOE 20C. Concurrent enrollment in BIOE 163L is required. D. Potts

**163L. Ecology of Reefs, Mangroves, and Seagrasses Laboratory (2 credits). \***

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(s): BIOL 20A, BIOE 20B, and BIOE 20C. Concurrent enrollment in BIOE 163 is required. D. Potts

**165. Marine Conservation Biology. F**

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 Environmental Studies 120. Prerequisite(s): BIOL 20A, BIOE 20B, and BIOE 20C; OCEA 101 recommended. The Staff

**172. Population Genetics. \***

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(s): BIOL 20A, BIOE 20B, BIOE 20C, and BIOL 105. Concurrent enrollment in BIOE 172L is required. Offered in alternate academic years. G. Pogson

**172L. Population Genetics Laboratory (2 credits). \***

A companion course to 172, Population Genetics, that applies the theory developed in that course to related disciplines including conservation biology, ecology, agriculture, and population biology. Original scientific literature relating to the theory developed in BIOE 172

## Biology: Ecology and Evolutionary Biology

is read, and applied problem sets are solved by the students. Students cannot receive credit for this course and BIOE 272L. Prerequisite(s): BIOL 20A, BIOE 20B, BIOE 20C, and BIOL 105. Concurrent enrollment in BIOE 172 is required. Offered in alternate academic years. G. Pogson

### **182F. Exploring Research in EEB (2 credits). F,W,S**

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. The Staff

### **183L. Undergraduate Research in EEB (3 credits). F,W,S**

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 and presentation skills. Prerequisite(s): concurrent enrollment in course 183W and an Undergraduate Research Contract on file with the department. The Staff

### **183W. Undergraduate Research in EEB--Writing (2 credits). F,W,S**

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(s): satisfaction of the Entry Level Writing and Composition requirements; and course 107, 108, or 109; and an undergraduate research contract on file with the department. The Staff

### **188. Introduction to Science Writing. S**

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. (Also offered as Science Communication 160. Students cannot receive credit for both courses.) Prerequisite(s): satisfaction of the Entry Level Writing and C1, C2 requirements. Enrollment restricted to junior and senior biological sciences majors. Enrollment limited to 18. (General Education Code(s): W.) R. Irion

### **193. Independent Research in EEB. F,W,S**

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. May be repeated for credit. The Staff

### **193F. Independent Research in EEB (2 credits). F,W,S**

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. May be repeated for credit. The Staff

### **195. Senior Thesis. F,W,S**

An individually supervised course, with emphasis on independent research. Students required to submit a senior thesis. Enrollment 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. The Staff

### **198. Independent Field Study. F,W,S**

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. May be repeated for credit. The Staff

### **198F. Independent Field Study (2 credits). F,W,S**

Provides for two units 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. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

Reading, discussion, written reports, and laboratory research on

## Biology: Ecology and Evolutionary Biology

selected biological topics, using facilities normally available on campus. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

Two-unit Tutorial. Reading, discussion, written reports, and laboratory research on selected biological topics, using facilities normally available on campus. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## GRADUATE COURSES

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### **200A. Scientific Skills. F**

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. Enrollment restricted to graduate students. M. Carr

### **200B. Advanced Organismal Biology. F**

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. Enrollment restricted to graduate students. B. Lyon, J. Estes, D. Costa

### **208. Marine Ecology. W**

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 course 108. Enrollment restricted to graduate students. P. Raimondi, K. Kroeker

### **245. Plant Ecology. F**

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 course 145. Prerequisite(s): BIOE 107 or ENVS 24 or permission of instructor. Concurrent enrollment in BIOE 245L is required except by permission of instructor. Enrollment restricted to graduate students. The Staff

### **245L. Field Methods in Plant Ecology Laboratory. F**

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 course 145L. Concurrent enrollment in BIOE 245 is required. Enrollment restricted to graduate students. Enrollment limited to 2. The Staff

### **247. Community Ecology. S**

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 course

147. Enrollment restricted to graduate students. The Staff

### **258L. Experimental Marine Ecology. \***

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. Enrollment limited to 20. Offered in alternate academic years. P. Raimondi, K. Kroeker

### **272. Population Genetics. F**

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 Biology 172. Concurrent enrollment in BIOE 272L is required. Enrollment restricted to graduate students. Offered in alternate academic years. G. Pogson

### **272L. Population Genetics Laboratory (2 credits). F**

A companion course to 272, Population Genetics, that applies the theory developed in that course to related disciplines including conservation biology, ecology, agriculture, and population biology. Original scientific literature relating to the theory developed in course 272 is read, and applied problem sets are solved by the students. Students cannot receive credit for this course and course 172L. Must be taken concurrently with BIOE 272. Enrollment restricted to

graduate students. Offered in alternate academic years. G. Pogson

**274. Evolutionary Game Theory.**

**W**

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 Economics 166B or Computer Science 166B. (Also offered as Computer Science 272. Students cannot receive credit for both courses.) B. Sinervo, The Staff

**279. Evolutionary Ecology. W**

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. Enrollment restricted to graduate students. The Staff

**281A. Topics in Basic and Applied Marine Ecology. F,W,S**

Seminar focusing on concepts in basic and applied ecology. Structure rotates quarterly between graduate student research and readings of journal articles and textbooks. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. M. Carr

**281B. Topics in Molecular Evolution (2 credits). F,W,S**

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. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. May be repeated for credit. G. Bernardi

**281C. Topics in Physiological Ecology. F,W,S**

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. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. May be repeated for credit. D. Costa

**281E. Topics in Freshwater Ecology. F,W,S**

Current topics in freshwater ecology, eco-evolutionary dynamics, fisheries, and fish ecology. Enrollment restricted to graduate students. Qualified undergraduates may enroll with permission from instructor. Enrollment limited to 18. May be repeated for credit. E. Palkovacs

**281F. Ecological Research Topics. F,W,S**

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. Enrollment restricted to graduate students;

qualified undergraduates may enroll with permission of instructor. Enrollment limited to 10. May be repeated for credit. L. Fox

**281H. Topics in Comparative Marine Physiology. F,W,S**

Intensive seminar on selected topics in marine physiology. Students present results from their own research and discuss recent advances from the literature. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. May be repeated for credit. R. Mehta

**281I. Topics in Disease Ecology, Population Biology, and Conservation. F,W,S**

Selected topics in population biology and disease ecology. Students present results from their own research and discuss recent advances from the literature. (Formerly "Topics in Plant Population and Disease Ecology") Enrollment restricted to graduate students; qualified undergraduates may enroll by permission of instructor. Enrollment limited to 18. May be repeated for credit. A. Kilpatrick

**281J. Topics in Research on Biochemical Ecology. \***

Seminar in which students give critically evaluated presentations regarding current research on selected topics in plant ecology with an emphasis on biochemical ecology. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. Enrollment limited to 12. May be repeated for credit. J. Langenheim

**281K. Topics in Plant Evolution. F,W,S**

Intensive seminar on selected topics in plant evolution. Students

present results from their own research and discuss recent advances from the literature. Enrollment restricted to graduate students; qualified undergraduates may enroll by permission of instructor. Enrollment limited to 18. May be repeated for credit. K. Kay

**281L. Topics in Behavioral and Evolutionary Ecology. F,W,S**

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. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. Enrollment limited to 10. B. Lyon

**281N. Topics in Marine Vertebrate Ecology. F,W,S**

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. Enrollment restricted to graduate students. Enrollment limited to 12. May be repeated for credit. D. Croll

**281O. Topics in Plant-Water Relations. F,W,S**

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. Enrollment restricted to graduate students; qualified undergraduates may enroll by permission of instructor. Enrollment limited to 18. May be repeated for credit. J. Pittermann

**281P. Topics in Plant Population Ecology. F,W,S**

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. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission from instructor. Enrollment limited to 12. May be repeated for credit. I. Parker

**281Q. Topics in Molecular Evolutionary Genetics. F,W,S**

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. Enrollment restricted to graduate students; qualified undergraduate students may enroll with permission of instructor. Enrollment limited to 10. May be repeated for credit. G. Pogson

**281R. Topics in Marine Ecology and Evolutionary Biology. F,W,S**

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. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. May be repeated for credit. P. Raimondi

**281S. Topics in Ancient DNA and Paleogenomics. F,W,S**

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. Enrollment restricted to graduate students. Qualified undergraduates may enroll with permission from instructor. May be repeated for credit. B. Shapiro

**281T. Species Interactions and Coevolution. F,W,S**

The genetics and ecological structure of species interactions, and the role of coevolution between species in shaping biodiversity. Enrollment restricted to graduate students. Enrollment limited to 15. May be repeated for credit. J. Thompson

**281U. Topics in Invertebrate Biology. F,W,S**

An intensive study about concepts, theory, and techniques for graduate students conducting research on the ecology, genetics, evolution, systematics, or biodiversity of marine invertebrates. Enrollment restricted to graduate students; advanced undergraduates may enroll with permission of instructor. Enrollment limited to 15. May be repeated for credit. D. Potts

**281V. Topics in Behavioral Ecology. F,W,S**

A discussion of current topics and methods in behavioral ecology and life history evolution. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. May be repeated for credit. B. Sinervo

**281W. Topics in Exercise and Environmental Physiology. F,W,S**

A weekly seminar discussion on current research and techniques in mammalian exercise and

## Biology: Ecology and Evolutionary Biology

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. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. May be repeated for credit. T. Williams

### **286. Experimental Design and Data Analysis. W**

Focuses on problems and designs in ecology and population biology. Topics include basic experimental design; exploratory data analysis—from a graphical perspective; hands-on statistics; and graphical theory. Structured around a statistical analysis and graphics computer program to teach students to design their own surveys and experiments and analyze their data correctly. Students cannot receive credit for this course and course 186. Prerequisite(s): one course in statistics or by permission of instructor. Enrollment restricted to

graduate students. P. Raimondi

### **286L. Experimental Design and Data Analysis Lab (2 credits). W**

Required lab that accompanies Biology 286. Lab will focus on hands-on statistical problem solving, graphical presentations and experimental design issues. Concurrent enrollment in course 286 is required. Enrollment restricted to graduate students. P. Raimondi

### **293. Readings in Ecology and Evolution (2 credits). W,S**

Weekly readings and discussions of recent research papers in ecology, evolution, and related topics from organismal biology. Enrollment restricted to graduate students. May be repeated for credit. A. Kilpatrick, L. Fox

### **294. Ecology, Evolutionary Biology Seminar (no credit). F,W,S**

Selected topics of current interest to ecologists and evolutionary biologists presented by weekly guest speakers. Enrollment restricted to graduate students. T.

Williams, B. Shapiro, D. Croll

### **295. Advanced Ecology and Evolutionary Biology Seminar (no credit). F,W,S**

Course consists of extended weekly meetings organized around an advanced theme in theoretical or applied evolutionary biology, ecology, physiology, behavior, or other aspect of organismal biology. Course is targeted at students who already have reached a professional level of expertise in their field and advanced master students. Enrollment restricted to graduate students. Enrollment limited to 24. The Staff

### **297. Independent Study. F,W,S**

Independent study for graduate students who have not yet settled on a research area for their thesis. Students submit petition to sponsoring agency. The Staff

### **299. Thesis Research. F,W,S**

Students submit petition to sponsoring agency. The Staff

\* Not offered in 2015-16

Revised 09/01/2015

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# BIOLOGY: MOLECULAR, CELL, AND DEVELOPMENTAL BIOLOGY

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2015-16 General Catalog

Molecular, Cell, and Developmental Biology Department

225 Sinsheimer Laboratories

(831) 459-2385

<http://www.mcd.ucsc.edu>

Physical and Biological Sciences Undergraduate Affairs Office

142 Jack Basking Engineering Bldg.

(831) 459-4143

<http://undergrad.pbsci.ucsc.edu>

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## PROGRAM DESCRIPTION

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### UNDERGRADUATE PROGRAM DESCRIPTION

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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.

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:

Human biology B.S.

Molecular, cell, and developmental biology B.S.

Neuroscience B.S.

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.

### PREREQUISITES

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Due to the demanding nature of the majors, students must begin their science coursework as early as possible. CHEM 1A, 1B and 1C, and BIOL 20A and BIOE 20B must be taken during the first and second years in order for students to qualify for admission to MCD biology-sponsored majors (see below). Students are strongly encouraged to take AMS 5 or AMS 7/L and begin, if not complete, other requirements including math, calculus, and statistics.

An online Mathematics Placement Examination is offered at various periods prior to enrollment for each quarter. Biological science majors are expected to take this examination. For more information see the Physical and Biological Sciences Undergraduate Affairs web site at <http://undergrad.pbsci.ucsc.edu>.

Students intending to major in human biology should take the Spanish placement examination, offered by the language program, to determine with which course they should begin the Spanish sequence. They should also complete the laboratory course 20L.

### MAJOR REQUIREMENTS QUALIFICATIONS POLICY

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The Department of Molecular Cell and Developmental Biology has a qualification policy that applies to the molecular, cell and developmental biology B.S. and neuroscience B.S. majors.

## Biology: Molecular, Cell, and Developmental Biology

To qualify for any of the majors, students must pass (with a grade of C or better) the following courses or their equivalents:

- Chemistry and Biochemistry 1A, General Chemistry;
- Chemistry and Biochemistry 1B, General Chemistry;
- Chemistry and Biochemistry 1C, General Chemistry;
- Biology: Molecular, Cell, and Developmental Biology (BIOL) 20A, Cell and Molecular Biology;
- Biology: Ecology and Evolutionary Biology (BIOE) 20B, Development and Physiology.

Students who want to declare the human biology B.S. are strongly encouraged to complete BIOL 20L prior to declaring.

Students with two or more grades of NP, C-, D+, D, D-, or F in the policy courses are not qualified to declare.

When assessing qualification:

- All courses must be taken for a letter grade, see [Letter Grade Policy](#).
- Students with AP credit for Biology: Molecular, Cell, and Developmental Biology (BIOL) 20A and Biology: Ecology and Evolutionary Biology (BIOE) 20B, need only pass Chemistry and Biochemistry 1B and 1C.
- Students with non-grades (I, IP, etc.) in any of the policy courses will not be eligible to declare until a grade has been assigned.
- Every student who satisfies the major qualification requirements and who petitions to declare the major by the campus major declaration deadline (i.e., before enrolling in their 3rd year or the equivalent) will be admitted to the major. Students enrolled in their final qualification policy course at the major declaration deadline may submit the petition, but will not be declared until satisfactory grades have been posted. Students who satisfy the major admission requirements, but who petition to declare the major after the campus major declaration deadline will be considered on a case-by-case basis for admission to the major; admission is not guaranteed.

The Department of Molecular Cell and Developmental Biology has a 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):

- Chemistry and Biochemistry 1A, General Chemistry
- Chemistry and Biochemistry 1B, General Chemistry
- Chemistry and Biochemistry 1C, General Chemistry
- Biology: Molecular, Cell, and Developmental Biology (BIOL) 20A, Cell and Molecular Biology

- Biology: Ecology and Evolutionary Biology (BIOE) 20B, Development and Physiology

All qualification courses must be completed by the campus major declaration deadline.

Students who want to declare the human biology B.S. are strongly encouraged to complete BIOL 20L prior to declaring.

Students with two or more grades of NP, D, or F in the policy courses are not qualified to declare.

When assessing qualification:

- All courses must be taken for a letter grade, see Letter Grade Policy.
- Students with AP credit for Biology: Molecular, Cell, and Developmental Biology (BIOL) 20A and Biology: Ecology and Evolutionary Biology (BIOE) 20B, need only pass Chemistry and Biochemistry 1B and 1C.
- Students with non-grades (I, IP, DG, etc.) in any of the policy courses will not be eligible to declare until a grade has been assigned.
- Every student who satisfies the major qualification requirements and who petitions to declare the major by the campus major declaration deadline (i.e. before enrolling in their 3rd year or the equivalent) will be admitted to the major. Students enrolled in their final qualification policy course at the major declaration deadline may submit the petition, but will not be declared until satisfactory grades have been posted. Students who satisfy the major admission requirements, but who petition to declare the major after the campus major declaration deadline will be considered on a case-by-case basis for admission to the major; admission is not guaranteed.

Students who are informed that they are not eligible to declare the major may appeal this decision by submitting a letter to the Molecular Cell and Developmental Biology Faculty Adviser 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. For more information about the appeal process see the Physical and Biological Sciences Undergraduate Affairs web site at <http://undergrad.pbsci.ucsc.edu/mcdb/qualifying/appeal-process.html>.

## TRANSFER STUDENTS

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Applications from transfer students in the biological sciences are encouraged. Prior to transfer, students must satisfy major qualification requirements: CHEM 1A, General Chemistry; CHEM 1B, General Chemistry;

## Biology: Molecular, Cell, and Developmental Biology

CHEM 1C, General Chemistry; BIOL 20A, Cell and Molecular Biology; BIOE 20B, Development and Physiology. Junior-level transfer students are also strongly encouraged to complete courses equivalent to MATH 11A, MATH 11B, and AMS 5 or AMS 7L prior to transfer. Intended human biology majors are strongly encouraged to learn Spanish to proficiency prior to transfer. Prospective transfer students should review the transfer information at <http://undergrad.pbsci.ucsc.edu/mcdb/transfer-students/index.html>.

### DOUBLE MAJOR IN THE BIOLOGICAL SCIENCES

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Students interested in pursuing multiple majors within the biological sciences may not declare any combination of biology (B.A., B.S., bioeducation concentration, or minor), molecular, cell and developmental biology, neuroscience, and biochemistry and molecular biology.

### HUMAN BIOLOGY MAJOR

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The B.S. major in human biology is designed for students interested in careers in medicine 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, cell biology, human physiology with laboratory and one additional course directly relevant to human health. Students in this program must also fulfill Spanish-language and health-care internship requirements.

### PROGRAM LEARNING OUTCOMES

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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; and
- Present advanced knowledge in the specialized field of human physiology.

### HUMAN BIOLOGY B.S. MAJOR REQUIREMENTS\*

#### Introductory Requirements

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Introductory Biology: BIOL 20A, BIOE 20B, and BIOL 20L

General Chemistry: Chemistry 1A, 1B/M and 1C/N

Organic Chemistry: Chemistry 108A/L and 108B/M

(**Note:** 109 is also recommended for pre-med students)

Calculus: Mathematics 11A-B or 19A-B

Statistics: Applied Mathematics and Statistics 5 or 7/L

Physics: Physics 6A/L, and 6C/N (**Note:** some medical schools require one full year of Physics/Labpratory)

#### Advanced Requirements

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Five core courses:

Biochemistry: BIOL 100 or BIOC 100A, 100B, 100C

Molecular Biology: BIOL 101

Genetics: BIOL 105

Cell Biology: BIOL 110

Human Physiology with Laboratory: BIOL 130/L

One of the following electives:

BIOL 111A, Immunology I

BIOL 111B, Immunology II

BIOL 113, Mammalian Endocrinology

BIOL 114, Cancer Cell Biology

BIOL 115, Eukaryotic Molecular Biology

BIOL 117, Neglected Tropical Diseases (3 credits)

BIOL 120, Development

BIOL 125, Neuroscience

BIOL 126, Advanced Neural Development

BIOL 127, Neurodegenerative Disease

BIOL 140, Biophysics

BIOL 178, Stem Cell Biology

Biomolecular Engineering 155, Biotechnology and Drug Development

Biomolecular Engineering 130, Genomes

Microbiology and Environmental Toxicology 119,

Microbiology

Microbiology and Environmental Toxicology, 135/L,

Anatomy of the Human Body/Laboratory

Internship Requirement: BIOL 189 and 189W, Health Sciences Internship. The student must participate in a community health-care service activity approved by the health sciences internship coordinator. Credit may be earned over multiple quarters.

Language Requirement: Spanish 1–4 or the equivalent and one quarter of Spanish for health-care workers (Spanish 5M).

## Biology: Molecular, Cell, and Developmental Biology

### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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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 courses BIOL 130L, Human Physiology Laboratory, and BIOL 189, Health Sciences Internship and BIOL 189W, Disciplinary Communication: Human Biology.

### HUMAN BIOLOGY B.S. SAMPLE PLANNERS

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For freshmen:

<http://undergrad.pbsci.ucsc.edu/mcdb/hbiobs/hbiobs-frosh-plans.html>

For transfer students:

<http://undergrad.pbsci.ucsc.edu/mcdb/hbiobs/hbiobs-transfer-plans.html>

[\[Return to top\]](#)

### MOLECULAR, CELL, AND DEVELOPMENTAL BIOLOGY MAJOR

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The molecular, cell, and developmental (MCD) biology major is designed for students interested in medical or other professional graduate programs and those preparing for careers in biotechnology industries. 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.

### 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.

### MOLECULAR, CELL, AND DEVELOPMENTAL BIOLOGY B.S. MAJOR REQUIREMENTS

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#### Introductory Requirements

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Introductory Biology: BIOL 20A, BIOE 20B, and 20C

General Chemistry: Chemistry 1A, 1B and 1C/N

Organic Chemistry: Chemistry 108A/L and 108B

Calculus: Mathematics 11A-B or 19A-B

Biostatistics: Applied Mathematics and Statistics 5 or 7/L

Physics: Physics 6A/L and 6B or 6C

#### Advanced Requirements

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Five core courses:

Biochemistry\*: BIOL 100; or the series Advanced Biochemistry and Molecular Biology 100A, 100B, 100C. (Upon completion of the series, Biochemistry and Molecular Biology 100C may be used to satisfy one lecture elective.)

Molecular Biology\*: BIOL 101

\*Instead of Biochemistry (BIOL 100) and Molecular Biology (BIOL 101), students may complete the series in Biochemistry and Molecular Biology 100A, 100B, 100C. (Upon completion of the series, Biochemistry and Molecular Biology 100C may be used to satisfy one lecture elective.)

Molecular Biology Laboratory: BIOL 101L

Genetics: BIOL 105

Cell Biology: BIOL 110

Three of the following electives:

(Only one of which may be a 3-credit course: BIOL 116 or BIOL 117)

Biochemistry and Molecular Biology 100C, Advanced Biochemistry

BIOL 111A, Immunology

BIOL 111B, Immunology II

BIOL 113, Mammalian Endocrinology

BIOL 114, Cancer Cell Biology

BIOL 115, Eukaryotic Molecular Biology

BIOL 116, Advanced Topics in Cell Biology (3 credits)

BIOL 117, Neglected Tropical Diseases (3 credits)

BIOL 118, Biology of Disease

BIOL 120, Development

BIOL 125, Neuroscience

BIOL 126, Advanced Neural Development

BIOL 127, Neurodegenerative Disease

BIOL 130/L, Human Physiology/Laboratory

BIOL 178L, Protocols in Stem Cell Biology

BIOE 109, Evolution

BIOE 135/L, Plant Physiology/Laboratory

Biomolecular Engineering 110, Computational Biology Tools

Biomolecular Engineering 130, Genomes

## Biology: Molecular, Cell, and Developmental Biology

Biomolecular Engineering 155, Biotechnology and Drug Development

Biomolecular Engineering 160/L, Research Programming for Biologists and Biochemists/Laboratory

Biomolecular Engineering 178, Stem Cell Biology Microbiology and Environmental Toxicology 119, Microbiology

Physics 180, Biophysics

One of the following laboratory courses:

BIOL 100L, Biochemistry Laboratory

BIOL 105L, Eukaryotic Genetics Laboratory

BIOL 105M, Microbial Genetics Laboratory

BIOL 109L Yeast Genetics Laboratory

BIOL 110L, Cell Biology Laboratory

BIOL 115L, Eukaryotic Molecular Biology Laboratory

BIOL 120L, Development Laboratory

BIOL 121L, Environmental Phage Biology Laboratory

BIOL 186L, Undergraduate Research in MCD

Biochemistry and Molecular Biology 110L, Advanced Biochemistry Laboratory

Microbiology and Environmental Toxicology 119L, Microbiology Laboratory

### Disciplinary Communication (DC) Requirement

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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: Biochemistry and Molecular Biology 110L; BIOL 100L, 105L, 105M, 109L, 110L, 115L, 120L, 121L, 186L, 187L; or Microbiology and Environmental Toxicology 119L.

### Molecular, Cell, and Developmental Biology B.S. Sample Planners

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For freshmen:

<http://undergrad.pbsci.ucsc.edu/mcdb/mcdbbs/mcdbbs-frosh-plans.html>

For transfer students:

<http://undergrad.pbsci.ucsc.edu/mcdb/mcdbbs/mcdbbs-transfer-plans.html>

### NEUROSCIENCE MAJOR

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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. Rigorous course work is supplemented by opportunities for hands-on research.

### Program Learning Outcomes

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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.

### NEUROSCIENCE B.S. MAJOR REQUIREMENTS

#### Introductory Requirements

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Introductory Biology: BIOL 20A, BIOE 20B and 20C

General Chemistry: Chemistry 1A, 1B and 1C/N

Organic Chemistry: Chemistry 108A/L and 108B

Calculus: Mathematics 11A-B

Biostatistics: Applied Mathematics and Statistics 5 or 7/L

Physics: Physics 6A/L and 6C

#### Advanced Requirements

---

Seven core courses:

Biochemistry: BIOL 100

Molecular Biology: BIOL 101

Molecular Biology Laboratory: BIOL 101L

Genetics: BIOL 105

Cell Biology: BIOL 110

Neuroscience: BIOL 125

Advanced Neuroscience: BIOL 126

Two of the following electives (only one of which may be a 3-credit course: BIOL 116 or BIOL 117):

BIOE 131/L, Animal Physiology/Laboratory

BIOE 140, Behavioral Ecology

BIOL 111A, Immunology I

BIOL 111B, Immunology II

BIOL 113, Mammalian Endocrinology

BIOL 114, Cancer Cell Biology

BIOL 115, Eukaryotic Molecular Biology

BIOL 116, Advanced Topics in Cell Biology (3 credits)

BIOL 117, Neglected Tropical Diseases (3 credits)

BIOL 118, Biology of Disease

## Biology: Molecular, Cell, and Developmental Biology

BIOL 120, Development  
BIOL 127, Neurodegenerative Disease  
BIOL 130/L, Human Physiology/Laboratory  
BIOL 178L, Protocols in Stem Cell Laboratory  
Biomolecular Engineering 110, Computational Biology Tools  
Biomolecular Engineering 130, Genomes  
Biomolecular Engineering 155, Biotechnology and Drug Development  
Biomolecular Engineering 160/L, Research Programming for Biologists and Biochemists/Laboratory  
Biomolecular Engineering 178, Stem Cell Biology  
Physics 180, Biophysics  
Psychology 121, Perception  
Psychology 123, Behavioral Neuroscience

One of the following laboratory electives:

BIOE 141L, Behavioral Ecology Field Course  
BIOL 100L, Biochemistry Laboratory  
BIOL 105L, Eukaryotic Genetics Laboratory  
BIOL 109L Yeast Genetics Laboratory  
BIOL 110L, Cell Biology Laboratory  
BIOL 115L, Eukaryotic Molecular Genetics Laboratory  
BIOL 120L, Development Laboratory  
BIOL 121L, Environmental Phage Biology Laboratory  
BIOL 186L, Undergraduate Research in MCD  
BIOL 187L, Molecular Biotechnology Laboratory

### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) Requirement. The DC Requirement in neuroscience is satisfied by completing one of the following: BIOE 141L, BIOL 100L, 105L, 109L, 110L, 115L, 120L, 121L, 186L, 187L.

### NEUROSCIENCE B.S. SAMPLE PLANNERS

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For freshmen:

<http://undergrad.pbsci.ucsc.edu/mcdb/nbiobs/nbiobs-frosh-plans.html>

For transfer students:

<http://undergrad.pbsci.ucsc.edu/mcdb/nbiobs/nbiobs-transfer-plans.html>

[\[Return to top\]](#)

### COMPREHENSIVE REQUIREMENT

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All majors require a comprehensive requirement. This requirement can be satisfied in one of the following ways:

- by passing course 190, Senior Seminar;
- by receiving a passing grade in an internship, independent research laboratory, or field course:

BIOE 114L, Field Methods in Herpetological Research  
BIOE 141L, Behavioral Ecology Field Course  
BIOE 145L, Field Methods in Plant Ecology  
BIOE 150L, Ecological Field Methods  
BIOE 151, Ecology and Conservation in Practice  
BIOE 155L, Freshwater Ecology Laboratory  
BIOE 158L, Marine Ecology Laboratory  
BIOE 159, Marine Ecology Field Quarter  
BIOE 161L, Kelp Forest Ecology Laboratory  
BIOE 183, Undergraduate Research in EEB  
BIOL 100L, Biochemistry Laboratory  
BIOL 105L, Eukaryotic Genetics Laboratory  
BIOL 105M, Microbial Genetics Laboratory  
BIOL 109L Yeast Genetics Laboratory  
BIOL 110L, Cell Biology Laboratory  
BIOL 111L, Immunology Laboratory  
BIOL 115L, Eukaryotic Molecular Biology Laboratory  
BIOL 120L, Developmental Biology Laboratory  
BIOL 121L, Environmental Phage Biology Laboratory  
BIOL 178L, Protocols in Stem Cell Biology  
BIOL 186L, Undergraduate Research in MCD Biology  
BIOL 186R, Undergraduate Research in MCD Biology  
BIOL 187L, Molecular Biotechnology Laboratory  
BIOL 189, Health Sciences Internship  
Biochemistry and Molecular Biology 110L, Advanced Biochemistry Laboratory  
Microbiology and Environmental Toxicology 119L, Microbiology Laboratory

- by completing a senior thesis;
- by 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 biological sciences adviser before the last day of the graduating quarter;
- by obtaining an 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 biological sciences adviser before the last day of the graduating quarter.

### Honors

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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.

### Letter Grade Policy

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For all students entering UCSC in fall 2001 and later, all courses used to satisfy any of the majors must be taken for a letter grade.

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## MEDICAL AND PROFESSIONAL SCHOOL ADMISSION

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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.

## COURSE SUBSTITUTION/TRANSFER CREDIT POLICY

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At least half of the upper-division courses (numbered 100–190) required for each major must be taken through the biological sciences program at UCSC, not as transfer credits from another department or institution. Transfer students are advised to contact the Physical and Biological Sciences Undergraduate Affairs office before enrolling in numerous upper-division courses at other institutions. For more information on transferring courses to UCSC, please consult the [undergraduate web site](#).

Students who wish to receive credit toward the major for different courses taken either at UCSC or at another institution should contact the Physical and Biological Sciences Undergraduate Affairs office.

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## EDUCATION ABROAD OPPORTUNITIES

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The UC Education Abroad Program (EAP) offers qualified students unique opportunities to broaden their educational horizons. The MCDB 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. Visit the EAP office as soon as possible to begin planning; you must seek advice about your EAP plan for major courses at UCSC from the biological sciences undergraduate adviser and/or faculty adviser and receive their approval for your plans.

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## ACADEMIC ADVISING

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Academic advising is available at the Physical and Biological Sciences Undergraduate Affairs office. Students should take full advantage of this opportunity and should keep in frequent touch with the office to stay informed about late announcements of courses, changes in scheduling, and opportunities for special study. For additional advice and information please see the [undergraduate web site](#).

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## GRADUATE PROGRAM DESCRIPTION

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The program in molecular, cell, and developmental (MCD) biology (courses BIOL) leads to either the doctor of philosophy (Ph.D.) or the master of arts (M.A.) 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, signaling, cell division, development, nerve cell function, and stem cell biology.

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### PH.D. PROGRAM

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Ph.D. students complete the graduate core courses, BIOL 200A, 200B, and 200C, and 200D in the first year. Students are required to participate in laboratory research meetings and departmental seminar series (BIOL 291/292) every quarter. First-year 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.

Second-year Ph.D. students are required to submit two proposals—one on their proposed thesis work and a second on an unrelated MCDB research topic. The Ph.D. qualifying examination, taken in spring quarter of the second year, is an oral examination on the two proposals. The examining committee is comprised of three internal reviewers and one external reviewer.

Once the qualifying examination is passed and prior to her/his department seminar, a student, with her/his faculty adviser, 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.

A student is advanced to candidacy following presentation of her/his research to the department in a seminar. 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.

This presentation takes place no later than spring of the third year. Ph.D. students must take two approved

## Biology: Molecular, Cell, and Developmental Biology

advanced graduate electives, in addition to the core courses.

### PH.D. REQUIREMENTS

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Complete the graduate core courses:

- BIOL 200A, Critical Analysis of Scientific Literature
- BIOL 200B, Advanced Molecular Biology
- BIOL 200C, Advanced Cell Biology
- BIOL 200D, Advanced Developmental Biology

Complete BIOL 289, Practice of Science

Enroll in the seminar series each quarter, Biology 291 and 292

Complete an oral qualifying examination

Present an advancement to candidacy seminar

Complete two advanced, graduate elective courses (see list below)

Meet yearly with a thesis committee after the qualifying examination

Complete two quarters of service as a teaching assistant

Complete thesis research resulting in peer-reviewed publications and a dissertation on original and significant work

Present the thesis defense in a departmental seminar

### M.A. PROGRAM

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Students apply to the master's degree program through the same portal as for the Ph.D. degree program. While the M.A. is research intensive, master's students do not do research rotations; they must identify a research adviser at the outset of the training period. Students are required to participate in laboratory research meetings and departmental seminar series every quarter.

#### M.A. Requirements

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Complete the graduate core course:

BIOL 200A, Critical Analysis of Scientific Literature (to be completed in the first year)

Complete BIOL 289, Practice of Science

Enroll in the seminar series each quarter, Biology 291 and 292

Complete two (2) approved advanced electives (list below). The two electives may be completed in either the first or second year

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.).

Approved Graduate Electives (Ph.D. and M.A. students complete two)

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BIOL 200B, Advanced Molecular Biology or,

BIOL 200C, Advanced Cell Biology or,

BIOL 200D, Advanced Developmental

BIOL 201, RNA Processing

BIOL 203, Ribosomes and Translation

BIOL 204, Chromatin and Transcription

BIOL 205, Epigenetics

BIOL 206, Introduction to Stem Cell Biology

BIOL 206L, Current Protocols in Stem Cell Biology

BIOL 207, Population Genetics

BIOL 208, Cellular Signaling Mechanisms

BIOL 214, Advances in Cancer Biology

BIOL 226, Advanced Neuroscience

BIOL 228, Developmental Neurobiology (new class)

AMS156, Linear Regression\*

AMS202, Linear Models\*

AMS205B, Intermediate Classical Interference\*

AMS256, Linear Statistical Models\*

BME110, Computational Biology Tools

BME130, Genomes

BME210, Applications and Analysis of Microarrays

BME220, Bioinformatics

BME230, Computational Genomics

BME237, Applied RNA Bioinformatics

Chem200A, Advanced Biochem: Biophysical Methods

Chem200B, Advanced Biochem: Protein Structure and Function

Chem200C, Advanced Biochem: Structure and Function of Nucleic Acids

Chem238, Topics in Biophysical Chemistry/Grant Writing

EE215, Micro-Electro-Mechanical Systems (MEMS) Design

METX202, Cellular and Molecular Toxicology

METX206A, Advanced Microbiology

METX210, Bacterial Pathogenesis

\*Students who have had no or very little statistics should audit or take AMS 7 (5 credits) and perhaps also AMS 7L (2 credits) to learn the basics, before taking one of the graduate-level courses.

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## BIOLOGY: MOLECULAR, CELL, AND DEVELOPMENTAL BIOLOGY FACULTY AND PROFESSIONAL INTERESTS

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**James Ackman**

Brain circuit structure and function

**Manuel Ares Jr.**

Regulation of RNA processing; structure, function and evolution of RNA-based systems

**Needhi Bhalla**

Meiotic chromosome dynamics

**Hinrich Boeger**

Chromatin dynamics and transcriptional regulation

**Barry Bowman**

Membrane biochemistry and genetics, biochemistry and molecular biology of membrane proteins

**Susan Carpenter**

Long noncoding RNA and innate immunity

**Bin Chen**

Mammalian brain development

**David Feldheim**

Developmental neuroscience

**Grant Hartzog**

Biochemistry, genetics, chromatin and transcriptional regulation

**Lindsay Hinck**

Breast development and cancer, cell biology, development

**Melissa Jurica**

Structure and function of human splicing machinery

**Rohinton T. Kamakaka**

Nuclear organization, chromatin domains, epigenetic gene regulation and insulators

**Douglas R. Kellogg**

Control of cell growth and size

**Jeremy Lee**

Molecular biology education and curriculum development; *Drosophila* models of neurodegeneration

**Robert A. Ludwig**

Plant microbe interactions, photorespiration, genetic recombination in plants

**Amy Ralston**

Origins and regulation of mammalian stem cells

**Michael Rexach**

Structure and function of nuclear pore complex, nuclear transport

**Jeremy Sanford**

Genomic analysis of protein-RNA interactions

**William M. Saxton**

Cytoskeletal motors and active transport processes

**Susan Strome**

Chromatin and RNA regulation in *C. elegans*

**William T. Sullivan**

Cell cycle, cytoskeleton, and host-pathogen interactions

**John W. Tamkun**

Transcriptional regulation, molecular genetics of *Drosophila* development, regulation of gene expression

**Zhu Wang**

Prostate development and cancer, tissue stem cells

**Alan M. Zahler**

Alternative pre-mRNA splicing and small RNA function

**Martha C. Zúñiga**

Negative selection of autoreactive T cells in the thymus and in peripheral lymphoid organs, immunological tolerance to epithelial antigens, MHC transfer between keratinocytes and dendritic cells

**Yi Zuo**

Synaptic plasticity in learning and memory

RESEARCH FACULTY

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**Harry Noller**

Ribosome structure and function; mechanisms of protein synthesis

MOLECULAR, CELL, AND DEVELOPMENTAL  
BIOLOGY EMERITUS FACULTY

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**Charles Daniel**

**Robert Edgar**

**Jerry F. Feldman**

**Kivie Moldave**

**Clifton A. Poodry**

**Lincoln Taiz**

**Frank J. Talamantes**

**Howard H. Wang**

MOLECULAR, CELL, AND DEVELOPMENTAL  
BIOLOGY LECTURERS

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**Linda Ogren**

**Giulia Ruben**

**Mary Zavanelli**



**Victoria Auerbach-Stone (Microbiology and  
Environmental Toxicology)**

The interaction between the gut pathogen *Yersinia* pseudotuberculosis and the mammalian immune system

**Rebecca Dubois (Biomolecular Engineering)**

Protein engineering; structural virology and biomedical applications

**Camilla Forsberg (Biomolecular Engineering)**

Hematopoietic stem cells; transcriptional regulation; chromatin; blood cell development; cell surface receptors; genomics

**Richard "Ed" Green (Biomolecular Engineering)**

Genomics, computational molecular biology, genome assembly, human evolutionary genetics, ancient DNA, high-throughput sequencing, mRNA-processing and alternative splicing

**David Haussler (Biomolecular Engineering)**

Bioinformatics, genomics, computational genomic data analysis, molecular evolution and comparative genomics, genomic and clinical data sharing and standards, cancer genomics, neurodevelopment, stem cell research, immunogenomics, information theory, pattern recognition, machine learning, artificial intelligence, information theory, theoretical computer science

**Scott Lokey (Chemistry and Biochemistry)**

Organic chemistry; combinatorial synthesis, biotechnology, molecular cell biology

**Todd M. Lowe (Biomolecular Engineering)**

Experimental and computation genomics, ncRNA gene finders, DNA microarrays to study the biology of Archaea

**Karen Ottemann (Microbiology and Environmental Toxicology)**

Environmental responses of pathogenic bacteria

**Carrie Partch (Chemistry and Biochemistry)**

Biochemistry and biophysics, nuclear magnetic resonance spectroscopy; molecular mechanism of circadian rhythmicity

**Seth Rubin (Chemistry and Biochemistry)**

Biomolecular mechanisms of cell-cycle regulation and cancer; structural biology and biochemistry; macromolecular x-ray crystallography; nuclear magnetic resonance

**William G. Scott (Chemistry and Biochemistry)**

Structure and function of RNA, proteins, and their complexes

**Beth Shapiro (Ecology and Evolutionary Biology)**

Evolutionary and molecular ecology, ancient DNA, genomics, pathogen evolution

**Alexander Sher (Physics)**

Development of experimental techniques for the study of neural function

**Michael Stone (Chemistry and Biochemistry)**

Single-molecule Biophysics and Enzymology; Structure, function, and assembly of the telomerase ribonucleoprotein, Fluorescence Resonance Energy Transfer (FRET), optical/magnetic trapping, sub-diffraction optical imaging of telomeres and the nucleus

**Fitnat Yildiz (Microbiology and Environmental Toxicology)**

Microbiology, molecular genetics, genomics; the mechanism of persistence of survival of *Vibrio cholerae*

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## BIOLOGY: MOLECULAR, CELL, AND DEVELOPMENTAL BIOLOGY COURSES

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### LOWER-DIVISION COURSES

**15. Undergraduate Research Reports (1 credit). F,W**

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. May be repeated for credit. M. Jurica, A. Zahler

**20A. Cell and Molecular Biology. F,W,S**

Introduction to molecular biology, cell physiology, and genetics. Prerequisite(s): Chemistry 1A and 1B; students with a chemistry AP score of 4 or higher who wish to start their biology coursework prior to completing the Chemistry 1A and 1B prerequisites, may enroll by permission of the instructor. (General Education Code(s): IN.) J. Tamkun, M. Rexach, B. Bowman

**20L. Experimental Biology Laboratory (2 credits). F,W,S**

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. Students are billed a materials fee. Prerequisite(s): BIOL 20A and previous or concurrent enrollment in BIOE 20B. Enrollment restricted to human biology and health sciences majors; other majors by

## Biology: Molecular, Cell, and Developmental Biology

permission. Enrollment limited to 20. The Staff

### **80A. Female Physiology and Gynecology. S**

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. (General Education Code(s): SI, T-2 Natural Sciences.) M. Zavanelli

### **80E. Evolution. \***

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. (General Education Code(s): SI, T-2 Natural Sciences.) M. Zavanelli

### **80J. Biology of AIDS. W**

An overview of the biology of the acquired immunodeficiency syndrome (AIDS) and the social and legal issues that surround it are explored in a series of lectures by biology faculty and experts in the field. (General Education Code(s): SI, T-2 Natural Sciences.) M. Zavanelli

## UPPER-DIVISION COURSES

### **100. Biochemistry. F,W**

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, 100B, and 100C sequence. Prerequisite(s): BIOL 20A and BIOE 20B; and CHEM 108A or 112A. J. Sanford, D. Kellogg

### **100L. Biochemistry Laboratory. F,W,S**

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. Students are billed a materials fee. Enrollment restricted to biological sciences and affiliated majors; biology minors; non-majors by instructor permission. (Formerly Advanced Biochemistry Laboratory.) Prerequisite(s): BIOL 100 or BIOC 100A, and BIOL 100K or BIOL 20L or BIOL 101L; satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 20. (General Education Code(s): W.) The Staff

### **101. Molecular Biology (3 credits). W,S**

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 course 20L, they are strongly encouraged to enroll in course 101L. Prerequisite(s):

course 100 or Biochemistry and molecular biology 100A. C. Vollmers, M. Jurica

### **101L. Molecular Biology Laboratory (2 credits). F,W,S**

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. Students are billed a materials fee. (Formerly Biochemistry Laboratory.) Previous or concurrent enrollment in BIOL 100, 101, or BIOC 100A is required. Students cannot receive credit for this course and BIOL 20L. J. Lee

### **105. Genetics. F,W,S**

Mendelian and molecular genetics; mechanisms of heredity, mutation, recombination, and gene action. Prerequisite(s): BIOL 20A and BIOE 20B. S. Strome, N. Bhalla, J. Lee

### **105L. Eukaryotic Genetics Laboratory. F,W,S**

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, bio-informatic and database analysis, genetic enhancers, and population genetics. Students are billed a materials fee. Enrollment restricted to biological sciences and affiliated majors; biology minors; non-majors by instructor permission. Prerequisite(s): BIOL 100 or BIOC 100A; BIOL 100K or BIOL 20L or BIOL 101L; BIOL 105; satisfaction of Entry Level Writing and Composition Requirements.

(General Education Code(s): W.)  
The Staff

### **105M. Microbial Genetics**

#### **Laboratory. \***

Exploration of basic genetics processes such as replication, mutation, DNA repair, recombination, gene exchange, population genetics, and evolution using microbial model organisms; classic techniques in microbial genetics and contemporary molecular techniques presented. Students are billed a materials fee. Enrollment restricted to biological sciences and affiliated majors; biology minors. Non-majors enroll by instructor permission. Prerequisite(s): BIOL 100 or BIOC 100A; and BIOL 100K or BIOL 20L or BIOL 101L, and BIOL 105. Satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 16. (General Education Code(s): W.)  
The Staff

### **109L. Yeast Molecular Genetics**

#### **Laboratory. F,W,S**

The powerful genetic and molecular techniques available for yeast combined with the complete genomic DNA sequence offers opportunity for discovery of fundamental aspects of eukaryotic life. Lab providing practical experience in using yeast as an experimental system. Students are billed a materials fee. Enrollment restricted to biological sciences and affiliated majors; biology minors. Non-majors enroll by instructor permission. Prerequisite(s): BIOL 100 or BIOC 100A; and BIOL 100K or BIOL 20L or BIOL 101L, and BIOL 105. Satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 15. (General Education Code(s): W.)  
G. Ruben

### **110. Cell Biology. F,S**

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(s): BIOL 100 or CHEM 103 or BIOC 100A, and BIOL 105. M. Rexach, L. Hinch

#### **110L. Cell Biology Laboratory. \***

Fundamental aspects of cell biology explored through experimentation in a modern laboratory setting. Research topics include the structure and function of biological membranes; intracellular transport and organelle biogenesis; the cell cycle; and the cytoskeleton. Students are billed a materials fee. Enrollment restricted to biological sciences and affiliated majors; biology minors. Non-majors enroll by instructor permission. Prerequisite(s): BIOL 100 or BIOC 100A, and BIOL 100K or BIOL 20L or BIOL 101L, and previous or concurrent enrollment in BIOL 110. Satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 16. (General Education Code(s): W.)  
The Staff

#### **111. Immunology. \***

Immune systems--their manifestations and mechanisms of action. Prerequisite(s): BIOL 20A, BIOE 20B, BIOL 105, and BIOL 110.  
G. Ruben

#### **111A. Immunology I. W**

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(s): courses BIOE 20B, and BIOL 20A, 105, and 110. M. Zuniga

#### **111B. Immunology II. S**

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(s): course 111A. M. Zuniga

#### **113. Mammalian Endocrinology. \***

Introduction to the major endocrine organs, their hormones, and their receptors. Emphasis is on the following topics: structural analysis of the hormones and receptors at the protein and molecular level, regulation of expression of hormones and their receptors, and the biological functions of hormones. Prerequisite(s): BIOL 20A, and BIOE 20B; and BIOL 100 or CHEM 103 or BIOC 100A; and BIOL 101L or BIOL 20L or BIOL 100K. The Staff

#### **114. Cancer Cell Biology. W**

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(s): BIOL 110 or 115. (General Education Code(s): TA.) A. Zahler

#### **115. Eukaryotic Molecular Biology. W**

Covers eukaryotic gene and genome organization; DNA, RNA, and protein synthesis; regulation of

## Biology: Molecular, Cell, and Developmental Biology

gene expression; chromosome structure and organization; and the application of recombinant DNA technology to the study of these topics. Prerequisite(s): BIOL 101 or BIOC 100A; and BIOL 105; and BIOL 101L or 100K. Enrollment restricted to biological sciences and affiliated majors, non-majors by permission of instructor. H. Boeger

### **115L. Eukaryotic Molecular Biology Laboratory. F,W,S**

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 course 187L or 287L. Students are billed a materials fee. Restricted to biological sciences/affiliated majors; biology minors; other majors by permission. Prerequisite(s): BIOL 100 or BIOC 100A or CHEM 103, and BIOL 100K or BIOL 20L or BIOL 101L, and previous or concurrent enrollment in BIOL 101 or 115. Satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 20. (General Education Code(s): W.) The Staff

### **116. Advanced Topics in Cell Biology (3 credits). S**

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(s): course 110. Enrollment restricted to senior human biology, molecular, cell, and developmental biology, and neuroscience majors. Other majors

by permission of instructor. Enrollment limited to 30. M. Rexach

### **117. Global Health and Neglected Diseases (3 credits). F**

Neglected tropical diseases afflict more than 1 billion of the poorest individuals on the planet. This course covers the molecular basis and pathology of the most prevalent neglected diseases and emerging strategies to combat these diseases. (Formerly Neglected Tropical Diseases.) Prerequisite(s): course 110. Enrollment restricted to senior human biology, molecular, cell, and developmental biology, and neuroscience majors. Other majors by permission of instructor. Enrollment limited to 30. W. Sullivan

### **118. Pathogenesis: Molecular Mechanisms of Disease. \***

Overview of the pathogenic mechanisms underlying human disease at the physiological and molecular levels, with their implications for epidemiology, diagnosis, and treatment. Includes discussion of clinical cases and of emerging areas of research. Geared toward students interested in future research or clinical careers in the area of human or animal health. Students cannot receive credit for this course and Microbiology and Environmental Toxicology 238. (Also offered as Microbiol & Environ Toxicology 138. Students cannot receive credit for both courses.) Prerequisite(s): Biology 130. Enrollment restricted to students majoring in biology; human biology; molecular, cell and developmental biology; biochemistry and molecular biology; or neuroscience. Offered in alternate academic years. M. Camps

### **120. Developmental Biology. W**

A description and analysis of selected developmental events in

the life cycle of animals. Experimental approaches to understanding mechanisms are emphasized. (Formerly Development.) Prerequisite(s): course 110. Z. Wang

### **120L. Development Laboratory. W**

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. Students are billed a materials fee. Enrollment restricted to biological sciences and affiliated majors; biology minors; other majors by permission. Prerequisite(s): BIOL 100 or BIOC 100A; and BIOL 100K or BIOL 20L or BIOL 101L; satisfaction of the Entry Level Writing and Composition requirements. Previous or concurrent enrollment in BIOL 120 is required. J. Lee

### **121L. Environmental Phage Biology Laboratory. \***

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 required. Students are billed a materials fee. Prerequisite(s): BIOL 100 or BIOC 100A; and BIOL 100K; satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to biological sciences and affiliated majors with sophomore standing or higher. Enrollment by application and permission of instructor. Enrollment limited to 20. G. Hartzog

### **125. Introduction to Neuroscience. W**

The structure and function of the nervous system. Topics include

## Biology: Molecular, Cell, and Developmental Biology

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(s): BIOL 20A, BIOE 20B; and BIOL 100 or BIOE 100A or CHEM 103; BIOL 110 is highly recommended. J. Ackman, D. Feldheim

### **126. Advanced Molecular Neuroscience. S**

Explores in detail cellular and molecular events that underlay the function of the nervous system. Topics include neural development, axon guidance and regeneration, advanced electrical principles (synaptic transmission through a variety of receptors), synaptic plasticity, learning and memory, as well as several neural disorders. Prerequisite(s): BIOL 125. (General Education Code(s): TA.) Y. Zuo

### **127. Mechanisms of Neurodegenerative Disease. \***

Focuses on cellular and molecular processes that underlie neurodegenerative diseases. Includes lectures, student oral presentations, discussions, a term paper, and exams. Prerequisite(s): course 110. (General Education Code(s): TA.) W. Saxton

### **130. Human Physiology. F,W**

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 course 131. Prerequisite(s): BIOL 110. G. Ruben

### **130L. Human Physiology Laboratory (2 credits). F,W**

Examines fundamental principles of

systemic physiology focusing on the human. Students cannot receive credit for this course and BIOE 131L. Students are billed a materials fee. Enrollment is restricted to biological sciences and affiliated majors; biology minors; other majors by permission. Prerequisite(s): Satisfaction of Entry Level Writing and Composition requirements; BIOL 110; previous or concurrent enrollment in BIOL130 is required. G. Ruben

### **178L. Protocols in Stem Cell Biology. \***

Provides hands-on experience in embryonic stem cell culture methods and techniques. Students grow and passage mouse embryonic stem (mES) cells and perform established protocols that differentiate mES cells into cardiac muscle cells and neurons. Enrollment restricted to biological sciences and affiliated majors; biology minors; non-majors by permission. Prerequisite(s): BIOL 100 or BIOE 100A; and BIOL 100K; satisfaction of the Entry Level Writing and Composition requirements; previous or concurrent enrollment in course 178. Enrollment limited to 16. The Staff

### **186F. Undergraduate Research in MCD Biology (2 credits). F,W,S**

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, is also

discussed. Prerequisite(s): BIOL 100 or BIOE 100A; and BIOL 100K or BIOL 20L or BIOL 101L. Each enrolled student must have a committed MCD faculty sponsor by the first class meeting. Enrollment restricted to biology and affiliated majors. May be repeated for credit. M. Rexach, Y. Zuo, H. Boeger

### **186L. Undergraduate Research in MCD Biology. F,W,S**

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 BIOE 100A; and BIOL 100K or BIOL 20L or BIOL 101L. Each enrolled student must have a committed MCD faculty sponsor by the first class meeting. Enrollment restricted to biology and affiliated majors. (General Education Code(s): W.) M. Rexach, Y. Zuo, H. Boeger

### **186R. Undergraduate Research in MCD Biology. F,W,S**

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

## Biology: Molecular, Cell, and Developmental Biology

professional schools, are discussed. Students cannot receive credit for this course and course 186L.

Prerequisite(s): BIOL 100 or BIOC 100A; and BIOL 100K or BIOL 20L or BIOL 101L; previous completion of the Disciplinary Communication requirement. Each enrolled student must have a committed MCD faculty sponsor by the first class.

Enrollment restricted to majors.

May be repeated for credit. M.

Rexach, Y. Zuo, H. Boeger

### **187L. Molecular Biotechnology Laboratory. \***

An intensive molecular biology laboratory that presents procedures used in molecular and biotechnology research. Topics and procedures include DNA/RNA isolation, cloning and library construction, southern and northern hybridization, DNA fingerprinting, PCR, manual and automated sequencing, and computer methods for analyzing molecular data. New procedures currently being developed in biotechnology industries are presented by industry representatives. Students cannot receive credit for this course and BIOL 115L or BIOL 287L. Students are billed a materials fee.

Prerequisite(s): BIOL 100 or BIOC 100A; and BIOL 100K and BIOL 110; satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 20. The Staff

### **188. Life in Healthcare (3 credits). S**

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.

Enrollment restricted to junior and senior human biology majors, and

others by permission of instructor. Enrollment limited to 30. (General Education Code(s): PR-E.) The Staff

### **189. Health Sciences Internship (3 credits). F,W,S**

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 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; concurrent enrollment in course 189W is required. Enrollment restricted to human biology majors. L. Hinck, M. Rexach, M. Zuniga

### **189W. Disciplinary Communication: Human Biology (2 credits). F,W,S**

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 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 restricted to human biology majors. L. Hinck, M. Rexach, M. Zuniga

### **191. ACE Program Service Learning (2 credits). F**

Students participate in training and development to co-facilitate collaborative learning in ACE chemistry discussion sections and midterm/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 restricted to sophomores, juniors, and seniors. (Formerly course 182.) Enrollment limited to 10. (General Education Code(s): PR-S.) The Staff

### **195. Senior Thesis Research. F,W,S**

An individually supervised course, with emphasis on independent research, to culminate in a senior thesis. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **198. Independent Field Study. F,W,S**

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. May be repeated for credit. The Staff

### **198F. Independent Field Study (2 credits). F,W,S**

Provides for two units of independent field study (a) by means other than the usual

## Biology: Molecular, Cell, and Developmental Biology

supervision in person, or (b) when the student is doing all or most of the coursework off campus. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

Reading, discussion, written reports, and laboratory research on selected biological topics, using facilities normally available on campus. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

Two-unit Tutorial. Reading, discussion, written reports, and laboratory research on selected biological topics, using facilities normally available on campus. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## GRADUATE COURSES

### **200A. Critical Analysis of Scientific Literature. F**

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. Enrollment restricted to graduate students in MCD biology, or by permission of instructor. Enrollment limited to 20. J. Sanford, J. Tamkun

### **200B. Advanced Molecular Biology. F**

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(s): Enrollment restricted to graduate students. A. Zahler, H. Boeger, M. Jurica

### **200C. Advanced Cell Biology. W**

An in-depth coverage of topics in cellular and subcellular organization, structure, and function in plants and animals. Emphasis on current research problems. Prerequisite(s): BIOL 200B. Enrollment restricted to graduate students. D. Kellogg, N. Bhalla, W. Saxton

### **200D. Developmental Biology. S**

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. Enrollment restricted to graduate students in MCD biology, or by permission of instructor. Enrollment limited to 20. S. Strome, Z. Wang, B. Chen

### **201. RNA Processing.**

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(s): BIOL 200B or permission of instructor. Enrollment restricted to graduate students. Enrollment limited to 15. M. Jurica, M. Ares

### **203. Ribosomes and Translation.**

\* 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(s): BIOC 100A, BIOL 200B or permission of instructor. Enrollment restricted to graduate students. The Staff

### **204. Chromatin. \***

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(s): BIOL 105 and BIOL 115; undergrads by permission of instructor. Enrollment restricted to graduate students. Enrollment limited to 15. Offered in alternate academic years. J. Tamkun, G. Hartzog

### **205. Epigenetics. \***

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(s): BIOL 105 and BIOL 115, or permission of instructor. Enrollment restricted to graduate students. Enrollment limited to 20. S. Strome, J. Tamkun

### **206. Introduction to Stem Cell Biology. F**

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;

## Biology: Molecular, Cell, and Developmental Biology

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. Enrollment restricted to graduate students. Enrollment limited to 15. W. Sullivan

### **206L. Current Protocols in Stem Cell Biology. \***

Provides students with hands-on experience in embryonic stem cell culture methods. Enrollment restricted to graduate students; qualified undergraduates may enroll by permission of instructor. Enrollment limited to 10. Y. Zuo, D. Feldheim

### **208. Cellular Signaling Mechanisms. \***

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(s): BIOL 105, BIOL 110, and BIOL 115. Enrollment restricted to seniors and graduate students. Enrollment limited to 15. Offered in alternate academic years. D. Kellogg

### **214. Advances in Cancer Biology. \***

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(s): course 200B or by permission of instructor. Enrollment restricted to graduate students. Enrollment limited to 15. L. Hinck

### **215. Applied Statistics for Molecular, Cell, and Developmental Biology. \***

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. Enrollment restricted to graduate students in molecular, cellular, and developmental biology. Enrollment limited to 20. The Staff

### **226. Advanced Molecular Neuroscience. S**

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. Enrollment restricted to graduate students. Y. Zuo

### **280A. Topics in Research on Molecular Genetics of Yeast (2 credits). F,W,S**

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. Enrollment restricted to graduate students; qualified undergraduates may enroll with approval of instructor. May be repeated for credit. M. Ares

### **280B. Chromatin Structure and Transcriptional Regulation (2 credits). F,W,S**

Weekly seminar on structure and gene regulatory function of

chromatin. Discusses research of participants and relevant scientific literature. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. Enrollment limited to 10. May be repeated for credit. H. Boeger

### **280C. Mammalian Brain Development (2 credits). F,W,S**

Seminar covers research into the development of the mammalian brain. Enrollment restricted to graduate students; undergraduates may enroll with permission of instructor. Enrollment limited to 10. May be repeated for credit. B. Chen

### **280D. RNA Processing (2 credits). F,W,S**

A discussion of current research and literature concerning the regulation of precursor messenger RNA processing. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. Enrollment limited to 10. May be repeated for credit. A. Zahler

### **280E. Meiotic Chromosome Dynamics (2 credits). F,W,S**

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. Enrollment restricted to graduate students; undergraduates may enroll with permission of instructor. May be repeated for credit. N. Bhalla

### **280F. Development of Vertebrate Neural Connections (2 credits). F,W,S**

Intensive research seminar on molecular mechanisms by which neural connections are established during mouse development. Special

## Biology: Molecular, Cell, and Developmental Biology

focus on topographic maps and role of Eph receptors and ephrins in this process. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. May be repeated for credit. D. Feldheim

### **280H. Topics on Research into Chromatin and Transcription (2 credits). F,W,S**

Seminar covering research into the effects of chromatin on transcription in yeast. Enrollment restricted to graduate students; undergraduates may enroll with permission of instructor. Enrollment limited to 10. May be repeated for credit. G. Hartzog

### **280I. Epigenetic Gene Silencing and Insulators (2 credits). F,W,S**

Intensive course on molecular mechanisms by which insulator elements regulate epigenetic gene silencing. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. May be repeated for credit. R. Kamakaka

### **280J. Structures of Macromolecular Complexes (2 credits). F,W,S**

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. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. Enrollment limited to 20. May be repeated for credit. M. Jurica

### **280K. Topics in Cell Cycle Research (2 credits). F,W,S**

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. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. D. Kellogg

### **280L. Development (2 credits). F,W,S**

Seminar covering research into breast development and cancer. (Formerly Topics on Neural Development.) Enrollment restricted to graduate students. Enrollment limited to 12. May be repeated for credit. L. Hinck

### **280M. Post-Transcriptional Control of Mammalian Gene Expression (2 credits). F,W,S**

Intensive course on the molecular mechanisms by which RNA binding proteins regulate gene expression. Enrollment restricted to graduate students; qualified undergraduates may enroll with the permission of the instructor. Enrollment limited to 8. May be repeated for credit. J. Sanford

### **280N. Structure and Function of Ribosomes (2 credits). F,W,S**

An intensive and advanced course focusing on the structure and function of ribosomes. Participants present research findings in an organized, critical fashion, in the context of current research literature in the ribosome field. Enrollment restricted to graduate students; qualified undergraduate students may enroll with permission of the instructor. Enrollment limited to 20. May be repeated for credit. H. Noller

### **280O. Topics in Bacterial Pathogenesis (2 credits). F,W,S**

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. (Also offered as Microbiol & Environ Toxicology 2810. Students cannot receive credit for both courses.) Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. Enrollment limited to 20. May be repeated for credit. K. Ottemann

### **280Q. Cell Biology of Oocytes, Embryos, and Neurons (2 credits). F,W,S**

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. Enrollment restricted to graduate students; undergraduates may enroll with permission of instructor. Enrollment limited to 10. May be repeated for credit. W. Saxton

### **280R. Structure and Function of the Nuclear Pore Complex (2 credits). F,W,S**

Intensive and advanced course focusing on structure and function of the nuclear pore complex. Participants present research findings in an organized critical fashion in the context of current research literature in the nucleocytoplasmic transport field. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. Enrollment limited to 10. May be repeated for credit. M. Rexach

**280S. Chromatin and RNA Regulation in *C. elegans* (2 credits). F,W,S**

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. Enrollment restricted to graduate students; undergraduates may enroll with permission of instructor. Enrollment limited to 10. May be repeated for credit. S. Strome

**280T. Molecular Biology of *Drosophila* Development (2 credits). F,W,S**

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. Enrollment restricted to graduate students. Qualified undergraduates may enroll with permission of instructor. Enrollment limited to 10. May be repeated for credit. J. Tamkun

**280U. Discussions on the Development of the *Drosophila* Embryo (2 credits). F,W,S**

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. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. May be repeated for credit. W. Sullivan

**280W. Membrane Proteins (2 credits). F**

Seminar on recent research on membrane proteins, with an emphasis on ion-pumping ATPase. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. Enrollment limited to 20. May be repeated for credit. B. Bowman

**280Y. Activity-Dependent Synaptic Plasticity (2 credits). F,W,S**

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. Enrollment restricted to graduate students; undergraduates may enroll with permission of instructor. Enrollment limited to 10. May be repeated for credit. Y. Zuo

**280Z. Prostate Development and Cancer Biology (2 credits). F,W,S**

Weekly research seminar covering gene regulation, cellular interactions, and stem cell behaviors in mammalian prostate development and prostate cancer progression. Enrollment is restricted to graduate students; undergraduates may enroll by the permission of the instructor. Enrollment limited to 10. May be repeated for credit. Z. Wang

**289. Practice of Science. W**

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(s): BIOL 200A, BIOL 200B, and BIOL 200C or permission of instructor. Enrollment restricted to graduate students; undergraduates may enroll with permission of the instructor. Enrollment limited to 20. D. Feldheim

**291. Molecular, Cellular, and Developmental Biology Seminar (2 credits). F,W,S**

Topics of current interest in molecular, cellular, and developmental biology are presented weekly by graduate students, faculty, and guest speakers. Enrollment restricted to graduate students. Enrollment limited to 60. May be repeated for credit. A. Zahler

**292. MCD Seminar (no credit). F,W,S**

Various topics by weekly guest speakers. Enrollment restricted to graduate students. A. Zahler

**296. Laboratory Research in Molecular, Cell, and Developmental Biology. F,W,S**

Independent laboratory research in molecular, cellular, and developmental biology. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**297. Independent Study. F,W,S**

Independent study for graduate students who have not yet settled on a research area for their thesis. Students submit petition to sponsoring agency. The Staff

**299. Thesis Research. F,W,S**

Students submit petition to sponsoring agency. The Staff

\* Not offered in 2015-16

Revised 09/01/15

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## CHEMISTRY AND BIOCHEMISTRY PROGRAM

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Chemistry and Biochemistry Department

230 Physical Sciences Building

(831) 459-4125

<http://chemistry.ucsc.edu>

Physical and Biological Sciences Undergraduate Affairs

142 Jack Baskin Engineering Building

(831) 459-4143

<http://undergrad/pbsci.ucsc.edu/index.html>

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### PROGRAM DESCRIPTION

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Chemistry is central to modern science and, ultimately, most phenomena in biology, medicine, 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, UCSC offers many lower-division courses, 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, analytical, and biochemistry. The curriculum is designed to meet the needs of students who plan to end their formal education with a bachelor of arts (B.A.) or bachelor of science (B.S.) degree, as well as those who wish to go on for an advanced degree. The UCSC chemistry B.A. or B.S. graduate is well prepared to pursue a career in chemistry or an allied field.

Research in chemistry at UCSC is closely interwoven with graduate and undergraduate education. The chemistry and biochemistry research program is active at the graduate level, and faculty also encourage undergraduates to become involved in research. Research is done for academic credit in Chemistry 195A-B-C, Senior Research; or in Chemistry 199, Tutorial. There are also opportunities for interdisciplinary research combining chemistry with a wide range of sciences, for example, physics, geology, oceanography, biology, computer science, microbiology and environmental toxicology. At UCSC, it is not uncommon for students to see their own original work published in research journals.

Chemistry and biochemistry faculty and approximately 90 graduate students and 30 postdoctoral fellows are housed in the Physical Sciences Building near the Science Library. Standard and specialized

spectrophotometric equipment, a number of instruments devoted to structural studies, instrumentation for specialized analytical purposes, and computer facilities used in studies of structure and reactivity are all available. The Science Library has an excellent collection of current journals, in print and electronic form, and reference works, as well as earlier volumes of all the major journals. Additional source material can be readily and rapidly obtained on interlibrary loan.

A degree in chemistry opens the door to a wide variety of academic careers. Some UCSC graduates are working as researchers in industry in areas such as electronic materials, biotechnology, medicinal chemistry, or laser technology. Others have entered government service as research chemists in the Food and Drug Administration, the Environmental Protection Agency, 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 research, teaching, or a combination of the two. 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

## Chemistry and Biochemistry Program

interdisciplinary area. Examples might be chemical oceanography, geochemistry, chemical physics, environmental chemistry, and health sciences. The B.A. might also be a good choice for students who wish to become high school teachers. However, 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 course of study.

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### PROGRAM LEARNING OUTCOMES

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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. or B.A. in chemistry or a B.S. in biochemistry and molecular biology should be able to:

1. 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);
2. 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, test the correctness of the solution, and interpret their results;
3. use modern library search tools to locate and retrieve scientific information about a topic, chemical, chemical technique, or an issue relating to chemistry, going beyond textbooks, common handbooks and general online resources, such as Wikipedia;
4. know and follow the proper procedures and regulations for safe handling and use of chemicals;
5. understand the objective of their chemical experiments, properly carry out the experiments, and appropriately record and analyze the results;
6. use computers in data acquisition and processing, and use available software as a tool in data analysis;

7. use standard laboratory equipment, modern instrumentation, and classical techniques to carry out experiments;
8. 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
9. 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.

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### HIGH SCHOOL PREPARATION

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Prospective chemistry majors are encouraged to get a solid foundation in high school mathematics; familiarity with algebra, logarithms, trigonometry, and analytic geometry is particularly recommended. Students who take chemistry at UCSC begin with Chemistry 1A or 1B, both of which require a strong background in high school chemistry. To assess your level of preparation in chemistry, please see the Chemistry Self-Assessment examination on the Undergraduate Affairs web site at <http://undergrad.pbsci.ucsc.edu/>. Students with a weak chemistry background should check this web site for recommended preparatory programs.

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### PREREQUISITES

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Prior to enrollment in the general chemistry sequence, CHEM 1ABC, students are encouraged to take the Chemistry Assessment Examination. For information about the assessment, visit the Physical and Biological Sciences Undergraduate Affairs web site at <http://undergrad.pbsci.ucsc.edu/>.

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### LETTER GRADE POLICY

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For all students entering UCSC in fall 2014 and later, all courses used to satisfy any of the majors requirements must be taken for a letter grade

Independent Study Course CHEM 199 may not be taken more than once per quarter and may be repeated no more than three times during an undergraduate career.

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### MAJOR QUALIFICATION POLICY

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The Department of Chemistry & Biochemistry has a qualification policy that applies to the following majors:

Chemistry BS

Chemistry BS with Biochemistry concentration

Chemistry BS with Environmental Chemistry concentration

Chemistry BA

## Chemistry and Biochemistry Program

To qualify to declare any of the above majors, students must achieve a cumulative grade point average (GPA) of 2.50 or greater in the following courses, or their equivalents:

CHEM 1A, General Chemistry

CHEM 1B, General Chemistry

CHEM 1C, General Chemistry

MATH 22, Introduction to Calculus of Several Variables

And one of the following calculus sequences:

MATH 11A and 11B, Calculus with Applications

MATH 19A and 19B, Calculus for Science, Engineering, and Mathematics

When determining qualification to declare the major:

- All courses must be taken for a letter grade.
- For policy courses that have been satisfied with AP credit based on an AP examination score of 5 (for Chemistry 1A), and an AP Calculus BC examination score of 4 or 5 (for Mathematics 11A or 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 the policy courses are not eligible to declare.

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 students, the college, and the Office of the Registrar of the decision. For more information about the appeal process see the Physical & Biological Sciences Undergraduate Affairs web site at <http://undergrad.pbsci.ucsc.edu/>.

### Transfer Students

The Chemistry and Biochemistry Department welcomes applications from community college students who are prepared to enter as junior-level chemistry majors. Prior to transfer, students must complete equivalents to the major qualification policy courses; a full year of both general chemistry and calculus. Transfer students are also strongly encouraged to complete a year of organic chemistry and a year of calculus-based physics. Transfer students are held to similar criteria for accessing the major and must complete the equivalents of the following courses to declare the major:

- CHEM 1A, General Chemistry
- CHEM 1B, General Chemistry
- CHEM 1C, General Chemistry
- MATH 11A, Calculus with Applications

- MATH 11B, Calculus with Applications
- MATH 22, Introduction to Calculus of Several Variables

Students planning to transfer to UCSC as a chemistry major from a California community college should reference [assist.org](http://assist.org) to determine which courses are equivalent to these required courses.

In addition to the required [transfer admissions](#) courses, we recommend that all transfer students complete equivalents of the following preparatory courses prior to transfer:

- CHEM 108A/L, Organic Chemistry with Lab
- CHEM 108B/M, Organic Chemistry with Lab
- PHYS 6A/L, Introductory Physics I
- PHYS 6B/ML, Introductory Physics II
- PHYS 6C/N, Introductory Physics III

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## REQUIREMENTS FOR THE CHEMISTRY B.A. DEGREE

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The requirements for the bachelor of arts 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 study areas of the humanities or social sciences, to complete major requirements late in their college career, or to concentrate on a study in 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 adviser.

### LOWER-DIVISION REQUIREMENTS

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General Chemistry: Chemistry 1A, 1B/M, and 1C/N

Calculus: Mathematics 11A, 11B, and 22; or Mathematics 19A, 19B, and 22

Physics: Physics 5A/L, 5B/M, and 5C/N; or Physics 6A/L, 6B/M, and 6C/N

### UPPER-DIVISION REQUIREMENTS

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Organic Chemistry: Chemistry 108A/L, 108B/M

Inorganic Chemistry: Chemistry 151A/L

Physical Chemistry: Chemistry 163A, 163B, and 164

One of the following laboratory courses:

Chemistry 146A, Advanced Laboratory in Organic Chemistry

## Chemistry and Biochemistry Program

Chemistry 146B, Advanced Laboratory in Inorganic Chemistry

Chemistry 146C, Advanced Laboratory in Physical Chemistry

Students currently conducting senior thesis research are required to choose an advanced laboratory in the Chemistry 146-series that is outside their research area.

### Elective(s)

At least two from the following:

Chemistry 103, Biochemistry

Chemistry 109, Organic Intermediate Chemistry

Chemistry 110/L, Intermediate Organic Chemistry with Emphasis on Synthesis and Analytical Methods/Intermediate Organic Chemistry Laboratory

Chemistry 143, Organic Chemical Structure and Reactions

Chemistry 151B, Chemistry of Main Element Groups

Chemistry 156C, Advanced Topics in Inorganic Chemistry

Chemistry 163C, Kinetic Theory and Reaction Kinetics, Statistical Mechanics, Spectroscopic Applications

Chemistry 167, Modern Chemical Biology

Chemistry 169, Chemistry and Biology of Drug Design and Discovery

Biochemistry and Molecular Biology 100A, Biochemistry and Molecular Biology

Biochemistry and Molecular Biology 100B, Biochemistry and Molecular Biology

Biochemistry and Molecular Biology 100C, Biochemistry and Molecular Biology

Microbiology and Environmental Toxicology 101, Sources and Fates of Pollutants

Microbiology and Environmental Toxicology 102, Cellular and Organismal Toxicology

Ocean Sciences 120, Aquatic Chemistry: Principles and Applications

Ocean Sciences 220, Chemical Oceanography

Physics 116A, Mathematical Methods in Physics

Physics 116B, Mathematical Methods in Physics

Physics 180, Biophysics

### 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

Chemistry 151L, Inorganic Chemistry Laboratory, and either Chemistry 146A, 146B, or 146C.

## CHEMISTRY MAJOR B.A. PLANNER

This is the ideal academic plan for chemistry B.A. majors. If needed, the plan can be arranged differently.

	Fall	Winter	Spring
<b>1st Year</b>	MATH 19A or 11A CHEM 1A	MATH 19B or 11B CHEM 1B/M	MATH 22 CHEM 1C/N
<b>2nd Year</b>	CHEM 108A/L PHYS 6A/L	CHEM 108B/M PHYS 6B/M	PHYS 6C/N
<b>3rd Year</b>	CHEM 163A	CHEM 163B CHEM 164	CHEM 146
<b>4th Year</b>	CHEM Elective	CHEM 103 CHEM 151A/L	CHEM Elective

## REQUIREMENTS FOR THE CHEMISTRY B.S. DEGREE

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. 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 REQUIREMENTS

General Chemistry: Chemistry 1A, 1B/M, and 1C/N

Calculus: Mathematics 11A, 11B, and 22; or Mathematics 19A, 19B, and 22

Advanced Mathematics: Applied Mathematics and Statistics 10, or Mathematics 21, or Mathematics 24

Physics: Physics 5A/L, 5B/M, and 5C/N; or Physics 6A/L, 6B/M, and 6C/N

### UPPER-DIVISION REQUIREMENTS

Organic Chemistry: Chemistry 108A/L, 108B/M, and 110/L

Inorganic Chemistry: Chemistry 151A/L

Biochemistry: Chemistry 103

Physical Chemistry: Chemistry 163A, 163B, 163C, and 164

One of the following laboratory courses:

## Chemistry and Biochemistry Program

Chemistry 146A, Advanced Laboratory in Organic Chemistry

Chemistry 146B, Advanced Laboratory in Inorganic Chemistry

Chemistry 146C, Advanced Laboratory in Physical Chemistry

Students currently conducting senior thesis research are required to choose an advanced laboratory in the Chemistry 146-series that is outside their research area.

### ELECTIVE(S)

At least two from the following list:

Chemistry 122, Principles of Instrument Analysis\*

Chemistry 143, Organic Chemical Structure and Reactions

Chemistry 151B, Chemistry of the Main Element Groups

Chemistry 156C, Advanced Topics in Inorganic Chemistry

Chemistry 167, Modern Chemical Biology

Chemistry 169, Chemistry and Biology of Drug Design and Discovery

Biochemistry and Molecular Biology 100A, Biochemistry and Molecular Biology

Biochemistry and Molecular Biology 100B, Biochemistry and Molecular Biology

Biochemistry and Molecular Biology 100C, Biochemistry and Molecular Biology

Microbiology and Environmental Toxicology 101, Sources and Fates of Pollutants

Microbiology and Environmental Toxicology 102, Cellular and Organismal Toxicology

Ocean Sciences 120, Aquatic Chemistry: Principles and Applications

Ocean Sciences 220, Chemical Oceanography

Physics 116A, Mathematical Methods in Physics

Physics 116B, Mathematical Methods in Physics

Physics 180, Biophysics

\*To receive certification from the American Chemical Society, you must complete Chemistry 122; see additional information below.

### 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 degree in chemistry is satisfied by completing

Chemistry 151L, Inorganic Chemistry Laboratory, and either Chemistry 146A, 146B, or 146C.

### CHEMISTRY MAJOR B.S. PLANNER

This is the ideal academic plan for those pursuing the chemistry B.S. major. If needed, this plan can be arranged differently.

	Fall	Winter	Spring
1st Year	MATH 11 or 19A CHEM 1A	MATH 11B or 19B CHEM 1B/M	MATH 22 CHEM 1C/N
2nd Year	CHEM 108A/L PHYS 6A/L	CHEM 108B/M PHYS 6B/M	CHEM 110/L PHYS 6C/N
3rd Year	CHEM 163A	CHEM 163B CHEM 164	CHEM 163C
4th Year	CHEM Elective	CHEM 103 CHEM 151A/L	CHEM Elective CHEM 146

### CHEMISTRY B.S. DEGREE WITH 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.

#### LOWER-DIVISION REQUIREMENTS

General Chemistry: Chemistry 1A, 1B/M, 1C/N

Calculus: Mathematics 11A, 11B, and 22; or Mathematics 19A, 19B, and 22

Advanced Mathematics: Applied Mathematics and Statistics 10, or Mathematics 21, or Mathematics 24

Introductory Biology: Molecular, Cellular and Developmental Biology (BIOL) 20A, and Ecology and Evolutionary Biology (BIOE) 20B

Physics: Physics 5A/L, 5B/M, and 5C/N; or Physics 6A/L, 6B/M, and 6C/N

#### UPPER-DIVISION REQUIREMENTS

Organic Chemistry: Chemistry 108A/L, 108B/M, and 110/L

Inorganic Chemistry: Chemistry 151A/L

Biochemistry: Biochemistry and Molecular Biology 100A-B-C and 110L

Physical Chemistry: Chemistry 163A, 163B, and 163C

## Chemistry and Biochemistry Program

### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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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 Chemistry 151L, Inorganic Chemistry Laboratory, and Biochemistry and Molecular Biology 110L, Advanced Biochemistry Laboratory.

### CHEMISTRY MAJOR B.S. WITH BIOCHEMISTRY CONCENTRATION PLANNER

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This is the most general academic plan for this major. If needed, the plan can be rearranged.

	Fall	Winter	Spring
<b>1st Year</b>	MATH 11 or 19A CHEM 1A	MATH 11B or 19B CHEM 1B/M	BIOE 20A MATH 22 CHEM 1C/N
<b>2nd Year</b>	CHEM 108A/L PHYS 6A/L BIOE 20B	CHEM 108B/M PHYS 6B/M	CHEM 110/L PHYS 6C/N
<b>3rd Year</b>	BIOC 100A	BIOC 100B	BIOC 100C BIOC 110L
<b>4th Year</b>	CHEM 163A	CHEM 163B CHEM 151A/L	CHEM 163C

### BIOCHEMISTRY AND MOLECULAR BIOLOGY B.S.

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See the biochemistry and molecular biology program description and major requirements.

### CHEMISTRY B.S. DEGREE WITH ENVIRONMENTAL CHEMISTRY CONCENTRATION

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A concentration within the biology, chemistry and biochemistry, and Earth sciences disciplines, collectively identified as the environmental sciences program, is offered. Students will develop a core competence suitable for pursuing graduate work in the environmental chemistry area or in graduate environmental sciences programs.

#### Lower-Division Requirements

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General Chemistry: Chemistry 1A, 1B/M, and 1C/N  
Introductory Biology: Molecular, Cell, and Developmental Biology (BIOL) 20A, and Ecology and Evolutionary Biology (BIOE) 20B

Geology: Earth Sciences 20/L, 10/L, or 5/L

Environmental Policy and Economics: Environmental Studies 25

Calculus: Mathematics 11A, 11B and 22; or 19A, 19B and 22

Physics: Physics 5A/L, 5B/M, and 5C/N; or Physics 6A/L, 6B/M, and 6C/N

#### Upper-Division Requirements

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Environmental Toxicology: Microbiology and Environmental Toxicology 101 or 102

Biochemistry: Chemistry 103

Organic Chemistry: Chemistry 108A/L, 108B/M and 110

Instrumental Analysis: Chemistry 122

Inorganic Chemistry: Chemistry 151A/L

Physical Chemistry: Chemistry 163A, 163B, and 164

Earth Sciences: Earth Sciences 110B/M

Ocean Sciences: Ocean Sciences 120 or 220 (Ocean Sciences 220 must be taken for a letter grade)

One of the following laboratory courses:

Chemistry 146A, Advanced Laboratory in Organic Chemistry

Chemistry 146B, Advanced Laboratory in Inorganic Chemistry

Chemistry 146C, Advanced Laboratory in Physical Chemistry

Students currently conducting senior thesis research are required to choose an advanced laboratory in the Chemistry 146-series that is outside their research area.

#### Disciplinary Communication (DC) Requirement

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Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) Requirement. The DC Requirement in chemistry with an environmental chemistry concentration is satisfied by completing Chemistry 151L, Inorganic Chemistry Laboratory, and either Chemistry 146A, 146B, or 146C.

## Chemistry and Biochemistry Program

### Chemistry Major B.S. with Environmental Chemistry Planner

This is the most general academic plan for this major. If needed, this plan can be rearranged.

	Fall	Winter	Spring
1st Year	MATH 11 or 19A CHEM 1A	MATH 11B or 19B CHEM 1B/M	MATH 22 CHEM 1C/N BIOL 20A
2nd Year	CHEM 108A/L PHYS 6A/L BIOE 20B	CHEM 108B/M PHYS 6B/M ENVS 25	EART 10/L CHEM 110/L PHYS 6C/N
3rd Year	BIOC 163A CHEM 122	CHEM 163B EART 110B/M CHEM 151A/L	
4th Year	METX 101	CHEM 164 OCEA 220	CHEM 103 CHEM 146B or 146C

#### REQUIREMENTS FOR THE MINOR

The course requirements for the minor, including electives, are the same as for the B.A. degree, with the exclusion of Chemistry 146A, 146B, 146C, 151A/151L, and 164. The minor has no senior comprehensive requirement.

#### COMPREHENSIVE REQUIREMENT

The comprehensive requirement is a part of all UCSC degrees. In the Department of Chemistry and Biochemistry, there are two options for satisfying this requirement:

**Senior thesis:** A senior research project based on original experimental or theoretical research (Chemistry 195A-B-C, Senior Research). At the conclusion of the project, the student submits a satisfactory formal research paper to the faculty sponsor. Students arrange for a faculty sponsor by consulting with a relevant faculty member within the chemistry and biochemistry or the biochemistry and molecular biology major programs. In some cases, faculty outside these major programs (for example, in biology, ocean sciences, microbiology and environmental toxicology, or Earth sciences) may be an appropriate sponsor. Students who select a sponsor outside the chemistry or the biochemistry and

molecular biology major programs should have the title and description of the proposed thesis reviewed by the Chemistry and Biochemistry Department undergraduate faculty adviser. Students, usually working in the laboratory of the faculty sponsor, acquire experimental and/or theoretical research experience and skills in the laboratory as well as instruction in the writing of a research paper. Students are expected to make satisfactory academic progress and be in good academic standing while they take Chemistry 195 courses. Students who achieve excellence in both research and thesis may be awarded honors in the thesis upon graduation.

**Senior essay:** An essay based on literature research (Chemistry 194, Senior Essay). After agreeing in advance on an appropriate topic of interest and a format, the student submits a satisfactory essay on the topic. Students arrange for a faculty sponsor by consulting with a relevant faculty member within the chemistry and biochemistry major program. In some cases, faculty outside these major programs (for example, in biology, ocean sciences, microbiology and environmental toxicology, or Earth sciences) may be an appropriate sponsor. Students who select a sponsor outside the chemistry and biochemistry major program should have the title and description of the proposed essay reviewed by the Chemistry and Biochemistry Department undergraduate faculty adviser. Students acquire experience and skills in scientific literature research as well as in the writing of a research paper.

#### ADVISING

The chemistry and biochemistry adviser provides counsel to undergraduate majors. Students are encouraged to seek out advising and assistance in planning their academic career to ensure completion of their major in a timely manner. For assistance with advising, please refer to the Physical and Biological Sciences Undergraduate Affairs web site at <http://undergrad.pbsci.ucsc.edu/>.

#### 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 \$15 to \$50 per course. Students may incur additional expense purchasing individual supplies.

#### PROGRAM FOR STUDENTS OF THE HEALTH SCIENCES

Students intending to enter medical, dental, or another health science professional school can satisfy entrance

## Chemistry and Biochemistry Program

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

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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 a B.S. major in chemistry (not including the biochemistry concentration) at UCSC, including Chemistry 122 as an elective. A year of study in a major modern foreign language (preferably German) is recommended. More information is available from the Chemistry and Biochemistry undergraduate adviser.

### HONORS IN THE MAJOR

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Honors in the Chemistry major requires a 3.5 or higher GPA 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.

### GRADUATE PROGRAMS

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The Chemistry and Biochemistry Department 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 teachers and others wishing to update or broaden their chemical expertise. Approximately 90 graduate students are currently enrolled in the graduate program.

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, organic chemistry, and bio-organic chemistry. Collaborative research efforts are encouraged, both intra- and inter-departmentally. The interdisciplinary Center for Biomolecular Science and Engineering emphasizes bioinformatics, nanotechnology, and computational approaches to chemistry. Biochemists join geneticists, computer scientists, and biologists in the Center for the Molecular Biology of RNA. Productive interactions have developed between the Chemistry and Biochemistry Department, the Department of Microbiology and Environmental Toxicology, the Department of Molecular, Cell and Developmental Biology, and the School of Engineering. Several Chemistry and Biochemistry faculty members also participate in the new graduate Program in Biomedical Sciences and Engineering.

Before beginning coursework, Ph.D. students take attainment examinations to confirm their level of preparation in four areas: organic, inorganic, physical, and biochemistry. First-year students take Chemistry 292 and 296 and enroll in core courses and electives related to their specialization. Core courses are Chemistry 200A, B, and C for biochemistry and biophysical chemistry; Chemistry 151B, 234 and either one of the 256 series or 268 for inorganic and bioinorganic chemistry; Chemistry 242A, 242B, 242C for organic chemistry; and Chemistry 261, 262, and 263 for physical chemistry. Organic studies students must pass four cumulative examinations based on assigned reading in current research journals within the first two years. Students select a research adviser and research committee by May 1 of the first year. The Ph.D. candidate's research committee meets formally with the student to evaluate research progress at least once a year. Students are expected to finish all Ph.D. requirements in five to six years.

M.S. students and Ph.D. students who have not advanced to candidacy enroll in a weekly seminar (Chemistry 291). Speakers from UCSC, other universities, and research labs expose students to advances at the frontiers of chemical research, offering the opportunity for personal contact with leading scientists.

Teaching assistantships provide both financial support and the opportunity to put into practice the required pedagogical training offered in Chemistry 296 (presentation techniques, discussion strategies, laboratory teaching skills, laboratory safety procedures,

## Chemistry and Biochemistry Program

and time management). Doctoral students are also supported as graduate-student researchers.

### Ph.D. Requirements

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- Pass three out of four attainment examinations and meet any deficiencies as directed by spring of the first year.
- Take Chemistry 292 and 296 in fall of the first year.
- Take Chemistry 291, Research Seminar, every quarter until advanced to candidacy.
- Organic studies students must pass four out of 12 "cumulative examinations" based on reading lists of current published organic research.
- Select an adviser and nominate members of the research committee by May 1 of the first year.
- Present a second-year seminar on a topic of current interest in published research outside the candidate's own research area.
- Serve as a teaching assistant (TA) during at least three quarters in the first two years, before attempting the Ph.D. oral qualifying examination.
- Pass five lecture courses (25 credits): at least four at the graduate (200) level, and at least four in chemistry and biochemistry (with departmental approval, up to two courses may be at upper-division undergraduate level).
- In 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 possible future direction, and (b) an original research proposal on a chemistry or biochemistry topic either related or unrelated to the candidate's current thesis research.
- Nominate members of the Dissertation Reading Committee (DRC).
- After advancing to candidacy, submit a research prospectus (outline of dissertation chapters) and meet with the DRC to review research progress annually.

- Submit an updated research prospectus (outline of dissertation chapters) to the DRC in the winter of the fifth year.
- Submit written dissertation based on original research.
- Present dissertation seminar.

The average time to degree is five and one-quarter years. 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.

For both Ph.D. and M.S. students, the standard course load is three courses per quarter, or a total of 15 credits per quarter.

### M.S. REQUIREMENTS: RESEARCH THESIS PATH

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- Pass three out of four attainment examinations in the first year.
- Take Chemistry 292.
- Take Chemistry 296 if working as teaching assistant (TA) at any time.
- Take Chemistry 291 each quarter.
- Select an adviser and nominate members of the research committee in the first year.
- Pass at least five Chemistry and Biochemistry lecture courses, of which at least three must be graduate (200) level.
- Conduct original laboratory research.
- Capstone requirement: write a thesis based on original research.

### M.S. REQUIREMENTS: COURSEWORK PATH

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- Pass three out of four attainment examinations in the first year.
- Take Chemistry 296 if enrolled as teaching assistant (TA) at any time.
- Take Chemistry 291 each quarter.
- Pass seven chemistry lecture courses (at least four at the graduate (200) level) from three of the four sub-disciplines: organic, inorganic, physical chemistry, and biochemistry.
- Capstone requirement: present a seminar on a topic of current interest in published research.

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## CHEMISTRY AND BIOCHEMISTRY FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**Ilan Benjamin**

Theoretical chemistry, molecular dynamics of chemical reactions in liquids and at interfaces

**Roberto A. Bogomolni**

Biophysical chemistry, photobiology, light energy conversion and signal transduction in biological systems

**Rebecca Braslau**

Synthetic organic chemistry: new synthetic methodologies using free radicals; nitroxides, nitroxide mediated "living" polymerizations: design and functionalization of tailored polymers for biomedical applications and nanotechnology, profluorescent nitroxides as sensors, synthetically modified polymers, development of non-migratory plasticizers

**Shaowei Chen**

Synthesis, characterization, and manipulation of novel functional nanomaterials (metals and semiconductors); surface engineering of nanoparticles; nanoscale electron transfer; applications in fuel cells, photocatalysis, photovoltaics, and nano optoelectronics

**Ólöf Einarsdóttir**

Time-resolved spectroscopy; biophysics and bioenergetics; heme-copper oxidases; electron transfer and ligand binding; application of photolabile NO and O<sub>2</sub> donors; molecular dynamics simulations of ligand access channels in heme-copper oxidases

**Theodore R. Holman**

Biochemistry and bioinorganic chemistry; lipoxygenase enzymology, protein engineering, inhibitor discovery, computer inhibitor design, mass spectroscopy, electron paramagnetic resonance

**Joseph P. Konopelski**

Synthetic organic chemistry; heterocyclic chemistry, bioorganic chemistry

**R.Scott Lokey**

Organic chemistry; combinatorial synthesis, biotechnology, molecular cell biology

**Pradip Mascharak**

Bioinorganic chemistry, design of antitumor drugs, modeling of active sites of metalloenzymes, design of catalysts for hydrocarbon oxidation, studies on intermediates in non-heme oxygenase chemistry, design of NO-donors for photodynamic therapy

**Glenn L. Millhauser**

Electron paramagnetic resonance; nuclear magnetic

resonance, protein structure and function, peptide synthesis, prions, melanocortin signaling

**Scott R. Oliver**

Materials chemistry: nanoporous inorganic and metal-organic materials for environmental cleanup of water, desulfurization of fuel and biomaterials

**William G. Scott**

Structure and function of RNA, proteins, and their complexes, origin of life

**Bakthan Singaram**

Organic synthesis, organoborane chemistry, heterocyclic chemistry, organometallic chemistry, asymmetric synthesis, biosensors, and natural products chemistry

**Jin Z. Zhang**

Design, synthesis, characterization, and application of nanomaterials, including semiconductors, metals, and metal oxides; ultrafast dynamics and laser spectroscopy; cancer diagnosis and therapy; solar energy conversion; surface-enhanced Raman spectroscopy (SERS)

### ASSOCIATE PROFESSOR

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**Yat Li**

Experimental physical chemistry, nanomaterials, energy conversion and storage, microbial fuel cell technology

**Roger G. Linington**

Marine natural products; drugs for neglected diseases; chemical biology; chemical probes

**Seth M. Rubin**

Biomolecular mechanisms of cell-cycle regulation and cancer; structural biology and biochemistry; macromolecular x-ray crystallography; nuclear magnetic resonance

**Michael Stone**

Molecular basis of telomere length and telomerase-related diseases; biophysical characterization of nucleic acid-associated molecular motors; development of novel approaches for imaging enzymes in cells

### ASSISTANT PROFESSOR

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**Alexander Ayzner**

Experimental physical chemistry; organic semiconductors; molecular spectroscopy; electron transfer dynamics; X-ray scattering and spectroscopy

**Carrie Partch**

Biochemistry and biophysics, nuclear magnetic

## Chemistry and Biochemistry Program

resonance spectroscopy; molecular mechanism of circadian rhythmicity

### **Jevgenij Raskatov**

Chemical biology, organic chemistry, molecular modeling, chemotherapy, inflammation

### **Nikolaos Sgourakis**

Modeling protein complexes from sparse NMR data; hybrid methods in structural biology; antigen processing and presentation; viral immune regulation mechanisms

## CHEMISTRY AND BIOCHEMISTRY RESEARCH PROFESSORS

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### **Philip O. Crews**

Marine natural products chemistry, bioorganic chemistry, organic structural analysis by NMR, natural products of marine macro- and microorganisms

### **David S. Kliger**

Time-resolved laser spectroscopy, biophysics, studies of visual transduction, protein function, and protein folding

## CHEMISTRY AND BIOCHEMISTRY EMERITUS FACULTY

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### **Roger W. Anderson**

Design of anti-reflection graded refractive index coatings for solar energy collection, achromatic focusing of molecules with external electric fields, discrete orthogonal polynomials in molecular collision theory, and semiclassical asymptotic analysis of Racah and Hahn polynomials

### **Frank C. Andrews**

### **Claude F. Bernasconi**

Kinetic studies of fast reactions, organic reaction mechanisms, acid-base catalysis, proton transfers, nucleophilic reactions, organometallic reactions, ab initio molecular orbital calculations

### **Joseph F. Bunnett**

Physical organic chemistry, with special attention to mechanisms of aromatic nucleophilic substitution

### **Thomas W. Schleich**

Biomedical magnetic resonance spectroscopy, magnetic resonance imaging, nuclear magnetic resonance spectroscopy, biophysical chemistry

### **Eugene Switkes**

Quantum theory applied to problems in chemistry and biochemistry; visual information processing, spatial vision, color vision

### **Stanley M. Williamson**

### **W. Todd Wipke**

Molecular engineering for drug discovery;

computational chemistry in improving cancer chemotherapy, solar energy conversion, and continuous glucose monitoring

## Chemistry and Biochemistry Lecturers

### **Caitlin Binder**

### **Randa Roland**



## ADJUNCTS

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### **Christopher H. Becker (Protein Metrics Inc.)**

Biological mass spectrometry, therapeutic protein development, biomarker development, chemical physics

### **William L. Fitch (Stanford, Roche Palo Alto)**

Organic mass spectrometry, drug metabolism, metabolomics, bioanalytical chemistry

### **Jinghua Guo (Lawrence Berkeley National Laboratory)**

Nanostructured materials, interfacial structure and chemistry in energy conversion, energy storage, and catalysis; electronic structure and synchrotron radiation based soft X-ray spectroscopy

### **Greg L. Hura (Lawrence Berkeley National Laboratory)**

Mechanisms of biological macromolecules inspire nanoscale engineering strategies and provide insights into disease; biochemistry and biophysics

## AFFILIATES

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### **Phillip Berman (Biomolecular Engineering)**

Drug development vaccines, AIDS, monoclonal antibody therapeutics, immunology, molecular cell/biology, recombinant protein production (commercial scale)

### **Manel Camps (Microbiology and Environmental Toxicology)**

Molecular mechanisms of reactive DNA methylation toxicity

### **A. Russell Flegal (Microbiology and Environmental Toxicology)**

Anthropogenic perturbations of biogeochemical cycles, applications of isotopic tracers in anthropology and archaeology

### **Donald R. Smith (Microbiology and Environmental Toxicology)**

Neurotoxicity, cellular and organismal responses to environmental toxins

### **Phillip Berman (Biomolecular Engineering)**

Drug development vaccines, AIDS, monoclonal antibody therapeutics, immunology, molecular cell/biology, recombinant protein production (commercial scale)

**Holger Schmidt (Electrical Engineering)**

Optofluidics, atom photonics, hollow-core photonics for biomedicine and quantum optics, nanomagnetism,

nanomagneto-optics, single-particle spectroscopy, ultrafast optics

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## CHEMISTRY AND BIOCHEMISTRY PROGRAM COURSES

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### LOWER-DIVISION COURSES

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**1A. General Chemistry. F,W,S**

First quarter of 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 expected to use algebra to solve problems. Prerequisite(s): Previous or concurrent enrollment in MATH 3 (or equivalent), or a mathematics placement score of 300 or higher; taking the online chemistry self-assessment exam is strongly recommended. (General Education Code(s): SI, IN, Q.) R. Roland, S. Rubin, G. Millhauser

**1B. General Chemistry. F,W,S**

Second quarter of 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 course 1M is recommended. (General Education Code(s): IN, Q.) J. Zhang, G. Millhauser, R. Bogomolni

**1C. General Chemistry. F,W,S**

Third quarter of 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. Prerequisite(s): course 1A. Concurrent enrollment in course 1N is required. (General Education Code(s): IN, Q.) P. Weiss

**1M. General Chemistry Laboratory (2 credits). F,W,S**

Laboratory sequence illustrating topics covered in courses 1B and 1C and important experimental techniques. Students are billed a materials fee. Prerequisite(s): Previous or concurrent enrollment in course 1B is required. R. Roland, P. Weiss

**1N. General Chemistry Laboratory (2 credits). F,W,S**

Laboratory sequence illustrating topics covered in courses 1B-1C, respectively, and important experimental techniques. Students are billed a materials fee. Prerequisite(s): Concurrent enrollment in course 1C is required. R. Roland

**99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**99F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

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### UPPER-DIVISION COURSES

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**103. Biochemistry. W**

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, 100B, and 100C sequence. Prerequisite(s): course 108B. M. Stone

**108A. Organic Chemistry. F,W**

Introduction to organic chemistry, with an emphasis on bonding and reactivity or organic compounds. Prerequisite(s): courses 1B and 1C. R. Lokey, J. Konopelski

**108B. Organic Chemistry. W,S**

Introduction to organic chemistry, with an emphasis on reactivity and synthesis of organic compounds. Prerequisite(s): course 108A. C. Binder, B. Singaram

**108L. Organic Chemistry Laboratory (2 credits). F,W**

Laboratory experience in organic chemistry associated with course 108A. 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. Students are billed a materials fee. Prerequisite(s): courses 1C and 1N and previous or concurrent enrollment in 108A is required. C. Binder

**108M. Organic Chemistry Laboratory (2 credits). W,S**

Laboratory experience in organic chemistry associated with course 108B. Designed to introduce the student to the many techniques associated with organic chemistry

## Chemistry and Biochemistry Program

while affording an opportunity to explore the concepts discussed in the lecture material. Laboratory: 4 hours, lecture: 1-1/4 hours. Students are billed a materials fee. Prerequisite(s): courses 108A and 108L and previous or concurrent enrollment in 108B is required. C. Binder

### **109. Intermediate Organic Chemistry and Applications to Biology (3 credits). S**

Integrated study of fundamental organic chemistry, with emphasis on materials especially relevant to biological sciences. Prerequisite(s): course 108B or equivalent. C. Binder

### **110. Intermediate Organic Chemistry with Emphasis on Synthesis and Analytical Methods. S**

An intermediate study of organic chemistry, including synthetic methods, reaction mechanisms, and application of synthetic chemistry techniques. Prerequisite(s): course 108B. Enrollment restricted to chemistry majors, minors and proposed majors. J. Raskatov

### **110L. Intermediate Organic Chemistry Laboratory (2 credits). S**

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. Students are billed a materials fee. Prerequisite(s): course 108M and previous or concurrent enrollment in course 110. Enrollment restricted to chemistry majors and minors. C. Binder

### **122. Principles of Instrumental Analysis. F**

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. Students are billed a materials fee. Prerequisite(s): course 110 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior chemistry (B.S.) majors. (General Education Code(s): W.) P. Mascharak

### **143. Organic Chemical Structure and Reactions. F**

Advanced topics such as the chemistry of terpenes, steroids, synthetic polymers, alkaloids, reactive intermediates, and reaction mechanisms are treated. Lecture: 4 hours. Prerequisite(s): course 110. B. Singaram

### **146A. Advanced Laboratory in Organic Chemistry (3 credits). F**

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. Students billed

a materials fee. Prerequisite(s): courses 110/L; satisfaction of Entry Level Writing and Composition requirements. Enrollment restricted to chemistry majors. Minors by permission of instructor. Enrollment limited to 16. C. Binder

### **146B. Advanced Laboratory in Inorganic Chemistry (3 credits). S**

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(s): courses 151A/L; 163A; satisfaction of Entry Level Writing and Composition requirements. Enrollment restricted to chemistry majors. Minors by permission of instructor. T. Holman

### **146C. Advanced Laboratory in Physical Chemistry (3 credits). S**

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. Students are billed a materials fee. Prerequisite(s): courses 163B and 164; satisfaction of Entry Level Writing and Composition requirements. Enrollment restricted to chemistry majors. Minors by permission of instructor. Enrollment limited to 20. Y. Li

### **151A. Chemistry of Metals.**

Fundamental topics of inorganic chemistry are presented at the level of the standard texts of field. Special

## Chemistry and Biochemistry Program

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(s): courses 108B/M and 163A. Concurrent enrollment in course 151L required. Enrollment restricted to chemistry majors and minors; other majors by permission of instructor. T. Holman

### **151B. Chemistry of the Main Group Elements. S**

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(s): courses 110, 110L, and 163A. Recommended for chemistry majors. P. Mascharak

### **151L. Inorganic Chemistry Laboratory (2 credits). W**

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 course 151A. Laboratory: 4 hours per week. Laboratory lecture: 1 1/4 hours per week. Students are billed a materials fee. Prerequisite(s): courses 108B/M and 163A. Concurrent enrollment in course 151A required. Enrollment restricted to chemistry majors and minors; other majors by permission of instructor. T. Holman

### **156C. Advanced Topics in Inorganic Chemistry. \***

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 course 256C. Prerequisite(s): course 151A. Enrollment restricted to seniors. S. Oliver

### **163A. Quantum Mechanics and Basic Spectroscopy. F**

A detailed introduction to quantum theory and the application of wave mechanics to problems of atomic structure, bonding in molecules, and fundamentals of spectroscopy. Prerequisite(s): courses 1B and 1C, Physics 5A-B-C or 6A-B-C and Mathematics 22 or 23B. Physics 6C can be taken concurrently. Y. Li

### **163B. Chemical Thermodynamics. W**

Fundamentals of thermodynamics and applications to chemical and biochemical equilibria. (Formerly Thermodynamics and Kinetic Theory.) Prerequisite(s): courses 1B and 1C, Physics 6A or 5A, and Math 22 or 23B. S. Chen

### **163C. Kinetic Theory and Reaction Kinetics, Statistical Mechanics, Spectroscopic Applications. S**

Introduction to statistical mechanics, kinetic theory, and reaction kinetics and topics in spectroscopy. Prerequisite(s): courses 163A and 163B. A. Ayzner

### **164. Physical Chemistry Laboratory. W**

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. Students are billed a materials fee.

Prerequisite(s): courses 1B and 1C; and Physics 5A and Physics 5B and Physics 5C, or Physics 6A and Physics 6B and Physics 6C; and Mathematics 22 or Mathematics 23B. Course 163A is recommended. A. Ayzner

### **169. Chemistry and Biology of Drug Design and Discovery. S**

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(s): course 103 or Biochemistry 100A. R. Lokey

### **170. Drug Action and Development. \***

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 270. (Formerly Frontiers in Drug Action and Discovery.) (Also offered as Biomolecular Engineering 170. Students cannot receive credit for both courses.) Prerequisite(s): Biology 100 or Chemistry 103 or Biochemistry 100A. Biology 110 and 130/L or 131/L are recommended. Enrollment restricted to juniors and seniors. D. Smith, T. Holman, M. Camps, R. Linington, P. Berman

### **182. ACE Program Service Learning (2 credits). F**

Students participate in training and development to co-facilitate collaborative learning in ACE chemistry discussion sections and midterm/exam review sessions.

## Chemistry and Biochemistry Program

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 restricted to sophomores, juniors, and seniors. Enrollment limited to 10. (General Education Code(s): PR-S.) N. Cox-Konopelski

### **194. Senior Essay. F,W,S**

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. The Staff

### **195A. Senior Research. F,W,S**

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. The Staff

### **195B. Senior Research. F,W,S**

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. The Staff

### **195C. Senior Thesis. F,W,S**

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. (Formerly Senior Research.) The Staff

### **199. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## **GRADUATE COURSES**

### **200A. Advanced Biochemistry: Biophysical Methods. F**

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. S. Rubin

### **200B. Advanced Biochemistry: Macromolecular Structure and Function. W**

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. (Formerly Advanced Biochemistry: Protein Structure and Function.) N. Sgourakis

### **200C. Advanced Biochemistry: Enzyme Mechanisms and Kinetics. \***

A study of enzyme kinetics, mechanisms, and factors involved in enzymic catalysis. Lecture: 3-1/2 hours. (Formerly course 231, Enzyme Mechanisms and Kinetics.)

W. Scott

### **230. Grant Writing in Biomedical Research. S**

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. Enrollment is restricted to graduate students. Enrollment limited to 16. C. Partch

### **234. Bioinorganic Chemistry. \***

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(s): courses 151A/L, 163A; and Biochemistry and Molecular Biology 100A. P. Mascharak

### **238. Topics in Biophysical Chemistry. \***

A discussion of the application of selected topics in biophysical chemistry to contemporary problems in biochemistry and molecular biology. Lecture: 3-1/2 hours. Offered in alternate academic years. C. Partch

### **242A. Modern Physical Organic Chemistry. W**

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.

## Chemistry and Biochemistry Program

Enrollment restricted to seniors who have taken course 143, and graduate students. J. Raskatov

### **242B. Modern Synthetic Methods in Organic Chemistry. F**

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. Enrollment restricted to seniors who have taken course 143, and graduate students. R. Braslau

### **242C. Spectroscopy and Applied Analytical Methods. \***

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. Enrollment restricted to seniors who have taken course 143, and graduate students. The Staff

### **246. Advanced Topics in Organic Chemistry. \***

A graduate course covering advanced topics in organic chemistry. Topics vary from year to year. The Staff

### **255. Biotechnology and Drug Development. W**

Recommended for students interested in careers in the biopharmaceutical industry. Focuses on recombinant DNA technology and the drug-development process, including discovery research; preclinical testing; clinical trials; and regulatory review, as well as manufacturing and production considerations. Students may not receive credit for this course and Biomolecular Engineering 155 and

Biology 179. (Also offered as Biomolecular Engineering 255. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. Enrollment limited to 15. P. Berman

### **256A. Advanced Topics in Inorganic Chemistry. \***

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(s): courses 151A/L and 146B or graduate standing. The Staff

### **256B. Advanced Topics in Inorganic Chemistry. \***

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(s): courses 151A/L and 146B or graduate standing. T. Holman

### **256C. Advanced Topics in Inorganic Chemistry. \***

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(s): courses 151A/L and 146B or graduate standing. S. Oliver

### **256D. X-ray Crystallography. \***

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. Enrollment restricted to graduate students and seniors who have taken courses 151A, 151L, and 163A. The Staff

### **261. Foundations of Spectroscopy. \***

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(s): course 163A. Offered in alternate academic years. J. Zhang

### **262. Statistical Mechanics. S**

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(s): course 160B or 163A. Offered in alternate academic years. I. Benjamin

### **263. Quantum Mechanics. \***

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(s): courses 163A and Physics 114A-B. Offered in alternate academic years. The Staff

### **265. Computer Simulation in Statistical Mechanics. \***

A detailed introduction of the use of computer simulation methods in

## Chemistry and Biochemistry Program

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. Offered in alternate academic years. I. Benjamin

### **266. Advanced Topics in Physical Chemistry. \***

A graduate course covering advanced topics in physical chemistry. Topics vary from year to year. The Staff

### **266A. Lasers and Their Chemical Applications. \***

Introduces the basic theoretical principles of lasers and laser light. Various types of lasers and selected applications to chemistry are discussed. The use of lasers in photochemistry, spectroscopy, chemical kinetics, and chemical analysis is considered. Lecture: 3-1/2 hours. Prerequisite(s): course 163A and Physics 114A-B. Offered in alternate academic years. May be repeated for credit. The Staff

### **268. Solid State and Materials Chemistry. \***

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(s): courses 163A and 163B. Enrollment restricted to senior and graduate chemistry majors. Y. Li

### **269. Electrochemistry. S**

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. Enrollment restricted to seniors and graduate students. R. Lokey

### **270. Drug Action and Development. \***

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.) (Also offered as Biomolecular Engineering 270. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. D. Smith, T. Holman, M. Camps, R. Linington, P. Berman

### **274. Proseminar in Synthetic and Polymer Chemistry. F,W,S**

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. May be repeated for credit. R. Braslau

### **275. Proseminar in Biological Inorganic Chemistry. F,W,S**

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. May be repeated for credit. T. Holman

### **280. Proseminar in Materials Chemistry. F,W,S**

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. May be repeated for credit. S. Oliver

### **282. Proseminar: Synthetic Methods. F,W,S**

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. May be repeated for credit. B. Singaram

### **284. Proseminar in Synthetic Organic Chemistry. F,W,S**

Weekly meetings devoted to the study of synthetic organic chemistry. Topics drawn from the current literature and the research interests of the participants. May be repeated for credit. J. Konopelski

### **285. Proseminar: Photobiochemistry and Photobiology. F,W,S**

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. Enrollment limited to 8. May be repeated for credit. R. Bogomolni

### **286. Proseminar in Natural Products Chemistry. F,W,S**

Weekly meetings devoted to the study of natural products. Topics drawn from the current literature and research interests of the

## Chemistry and Biochemistry Program

participants. May be repeated for credit. P. Crews

### **288. Proseminar in Bioinorganic Chemistry. F,W,S**

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. May be repeated for credit. P. Mascharak

### **291. Chemistry and Biochemistry Research Seminar. F,W,S**

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. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **292. Seminar (2 credits). F**

Enrollment restrictions: graduate standing or approval of the graduate adviser. J. Raskatov

### **296. Teaching Chemistry (2 credits). F**

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. R. Roland

### **297. Independent Study. F,W,S**

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. May be repeated for credit. The Staff

### **299. Thesis Research. F,W,S**

Students submit petition to sponsoring agency. The Staff

\* Not offered in 2015-16

Revised 09/01/2015

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# CHINESE

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2015-16 General Catalog

Department of Languages and Applied Linguistics

218 Cowell College

(831) 459-2054

<http://language.ucsc.edu>

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## PROGRAM DESCRIPTION

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Students interested in learning Chinese may enroll in language courses from beginning to advanced levels and should do so early in their careers at UCSC. Only those with **no** prior experience with the language may enroll in Chinese 1, which is only offered fall quarter. Heritage learners and those with prior instruction are required to take a placement exam. The Chinese 4H-5H sequence is designed to accommodate most heritage learners of Chinese. Students interested in combining their language study with their major focus may choose from a major or minor 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, or a global economics major.

The sequence of lower-division courses 1-6 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 Chinese 103, Language and Society in Taiwan

and the PRC; Chinese 104, Readings in Chinese Literature; Chinese 105, Readings in Chinese History; Chinese 107, Introduction to Classical Chinese Prose; and Chinese 108, Introduction to Classical Poetry.

### CAMPUS LANGUAGE LABORATORIES AND PLACEMENT EXAMS

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Information about these topics can be found under [Department of Languages and Applied Linguistics](#).

### STUDY ABROAD

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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 Office of International Education (OIE). Courses taken abroad can, with approval of an adviser, be applied to major requirements. For a list of current programs and requirements, visit their web site, <http://oie.ucsc.edu>. For information on credit applied to a major, please contact the appropriate department.

## CHINESE FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**Christopher L. Connery (Chinese Literature)**

World literature and cultural studies, globalism and geographical thought, the 1960s, Marxism, pre-modern and modern Chinese cultural studies, cultural revolution

### LECTURER

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**David L. Keenan**

Chinese language, fiction, and history

**Ting-Ting Wu**

Sociolinguistics, Chinese novels, learning styles and teaching methodology for non-heritage speakers

## CHINESE COURSES

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### LOWER-DIVISION COURSES

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**1. First-Year Chinese. F**

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. (Formerly Instruction in the Chinese (Mandarin) Language.)

The Staff

**2. First-Year Chinese. W**

Continuation of Chinese 1, which assumes that students are familiar both with the pinyin romanization system and approximately 150 basic characters. (Formerly Instruction in the Chinese

## Chinese

(Mandarin) Language.)

Prerequisite(s): course 1 or by consent of instructor. The Staff

### **3. First-Year Chinese. S**

Continuation of Chinese 2, which assumes that students are familiar both with the pinyin romanization system and approximately 300 basic characters. (Formerly Instruction in the Chinese (Mandarin) Language.)

Prerequisite(s): course 2 or by consent of instructor. The Staff

### **4. Second-Year Chinese. F**

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. (Formerly Intermediate Chinese (Mandarin).) Prerequisite(s): course 3 or by consent of instructor. (General Education Code(s): IH.) The Staff

### **4H. Accelerated Chinese for Heritage Speakers. F**

Intensive instruction in spoken and written Chinese for heritage students whose limited proficiency in Mandarin or limited familiarity with characters requires an accelerated review of the sounds, sentence patterns, and basic vocabulary before joining the Chinese sequence above the elementary level. Students who successfully complete Chinese 4H proceed to Chinese 5. Enrollment by instructor consent. The Staff

### **5. Second-Year Chinese. W**

Continuation of Chinese 4. Conversation, composition, and the reading of modern texts. (Formerly Intermediate Chinese (Mandarin).) Prerequisite(s): course 4 or 4H or by consent of instructor. (General Education Code(s): IH.) The Staff

### **5H. Accelerated Chinese for Heritage Speakers. W**

Intensive instruction in spoken and written Chinese for heritage students whose limited proficiency in Mandarin or limited familiarity with characters requires an accelerated review of the sounds, sentence patterns, and basic vocabulary before joining the Chinese sequence above the elementary level. Students who successfully complete Chinese 5H proceed to Chinese 6.

Prerequisite(s): Course 4H or by consent of instructor. The Staff

### **6. Second-Year Chinese. S**

Continuation of Chinese 5. Conversation, composition, and the reading of modern texts. (Formerly Intermediate Chinese (Mandarin).) Prerequisite(s): course 5 of 5H or by consent of instructor. (General Education Code(s): CC, IH.) The Staff

### **94. Group Tutorial. F,W,S**

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. May be repeated for credit. The Staff

### **99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **99F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## **UPPER-DIVISION COURSES**

### **103. Advanced Chinese. F**

Designed to enhance the students' ability to understand, analyze, and discuss authentic Chinese reading materials. Chinese linguistic and cultural aspects are introduced. (Formerly Advanced Chinese: Readings in Economics and Trade.)

Prerequisite(s): course 6 or by consent of instructor. (General Education Code(s): TA.) The Staff

### **104. Advanced Chinese: Readings in Literature. W**

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(s): course 103 or 105 or 107 or 108; or by consent of instructor. (General Education Code(s): TA.) The Staff

### **105. Advanced Chinese: Readings in History. S**

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(s): course 103 or 104 or 107 or 108; or by consent of instructor. (General Education Code(s): TA.) The Staff

### **107. Introduction to Classical Chinese Prose. \***

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. (Formerly Introduction to Classical Chinese.) Prerequisite(s): course 103 or 104 or 105 or 108; or by consent of instructor. Enrollment limited to 25. (General Education Code(s): TA, IH.) The Staff

### **108. Introduction to Classical Chinese Poetry. \***

Introduces the grammar and

## Chinese

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(s): course 103 or 104 or 105 or 107; or by consent of instructor. (General Education Code(s): TA, IH.) The Staff

**194. Group Tutorial. F,W,S**  
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. May be repeated for credit. The Staff

**199. Tutorial. F,W,S**  
Students submit petition to sponsoring agency. May be

repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S**  
Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised 09/01/2015

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# CLASSICAL STUDIES

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2015-16 General Catalog

Department of History

201 Humanities

(831) 459-2982

<http://classicalstudies.ucsc.edu/>

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## PROGRAM DESCRIPTION

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“Classics” is a traditional designation for the study of the literature, history, and culture of ancient Greece and Rome. Classical studies at UCSC combines features of traditional programs, such as solid grounding in ancient Greek and/or Latin, with innovative, interdisciplinary approaches (literary theory, gender studies, performance, and film).

Classical studies is an interdisciplinary field. While the core of the program is focused on courses in the ancient Greek and Latin languages it also includes courses in history, history of art and visual culture, linguistics, literature, philosophy, politics, religious studies, and theater arts. 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 offers an opportunity to work in small classes with a dedicated teaching faculty and excellent fellow students. Classical studies is an excellent preparation for further study in a wide variety of graduate and professional programs including comparative literature, English, philosophy, law, and publishing.

The basic requirements for the classical studies major allow a variety of emphases and concentrations. 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 administered by the Department of History. For additional information on curriculum and advising, go to <http://classicalstudies.ucsc.edu>.

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## PROGRAM LEARNING OUTCOMES

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Students who complete the classics major should graduate with the following knowledge and skills:

### LANGUAGE

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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

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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

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Provide constructive and effective critiques of each other's work.

Complete a shared research project.

### RESEARCH, CRITICAL READING, WRITING

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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.

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## SCOPE AND THEMATICS

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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

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## REQUIREMENTS FOR THE MAJOR

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A prerequisite for the classical studies major is the lower-division sequence in elementary Greek or Latin language (Greek 1 and 2 or Latin 1 and 2). A minimum of 40 upper-division units must be completed within the classical studies major course requirements. The major requires a total of 10 courses plus a senior comprehensive examination and must include the following:

- one lower-division survey of ancient history or literature in translation;
- three upper-division courses in Greek or Latin literature;
- six additional approved upper-division courses (which may include additional courses in Greek or Latin literature);
- enrollment in a 2-credit comprehensive examination preparatory course, Classical Studies (CLST) 197F or 199F, 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.

**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 web site for a more detailed description of this requirement at <http://classicalstudies.ucsc.edu>

### **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 102, 103, 104, and 105; or Latin Literature 102, 103, and 104.

**Honors in the Classical Studies Major.** 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.

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## REQUIREMENTS FOR THE MINOR

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A minor in classical studies requires the lower-division sequence in elementary Greek or Latin language (Greek 1 and 2 or Latin 1 and 2) and Greek or Latin Literature 100 plus any four of the upper-division courses listed as satisfying the classical studies major requirements.

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## CLASSICAL STUDIES FACULTY AND PROFESSIONAL INTERESTS

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### **Karen Bassi, Professor of Literature**

Greek and Latin literatures; gender; literary and cultural theory; pre- and early modern studies; historiography; visual and performance studies

### **John Bowin, Associate Professor of Philosophy**

Ancient philosophy, especially ancient science and metaphysics, and contemporary analytic metaphysics

### **Martin Devecka, Assistant Professor of Literature**

Greek and Latin languages and literatures; cultural history; Arabic language and literature; animal studies; history of technology; Renaissance studies

### **Maria Evangelatou, Associate Professor, History of Art and Visual Culture**

Medieval visual culture, with emphasis on Byzantium and its periphery; manuscript illumination, Marian cult and iconography; ancient Greek and Roman visual culture; Islamic visual culture; gender studies

### **Mary-Kay Gamel, Professor of Literature, Emerita**

### **Gildas Hamel, Security of Employment Lecturer of History, Emeritus**

**Charles W. Hedrick Jr., Professor of History**  
Greek and Roman history

**Jennifer K. Lynn, Continuing Lecturer in History and Literature**

Later Roman Republic and Principate; Homeric epic; Hellenistic and Augustan poetry; the lives of women in the ancient world

**John P. Lynch, Professor of Literature, Emeritus**

**Dean Mathiowetz, Associate Professor of Politics**  
Ancient political thought, philosophies of language and affect, early-modern and late-modern political economy

**Gary B. Miles, Professor of History, Emeritus**

**Daniel L. Selden, Professor of Literature**  
Afroasiatic languages and literatures, Greek and Latin, Hellenistic culture, the classical tradition, history of criticism, literary theory

**Elaine Sullivan, Assistant Professor of History**  
Pharaonic Period Egypt; Greek and Roman Egypt; women and gender; material culture; ritual landscape; 3D modeling; Digital Humanities and the use of emerging technologies in studying the ancient world

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PROGRAM FACULTY ADVISERS

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**Karen Bassi, Professor of Literature**

**Charles W. Hedrick Jr., Professor of History**

**Jennifer Lynn, Continuing Lecturer in History and Literature**

**Daniel L. Selden, Professor of Literature**

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CLASSICAL STUDIES COURSES

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LOWER-DIVISION COURSES

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**99. Tutorial. F**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

UPPER-DIVISION COURSES

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**197F. Senior Comprehensive Examination Preparation (2 credits). F,W,S**

Students submit petition to sponsoring agency. The Staff

**199. Tutorial. F**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

Revised 10/08/15

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# COGNITIVE SCIENCE

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2015-16 General Catalog

273 Social Sciences 2

(831) 459-2002

<http://psychology.ucsc.edu>

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## PROGRAM DESCRIPTION

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Cognitive science has emerged in the last few decades as a major discipline that promises to be increasingly important in the 21st century. Focused on achieving a scientific understanding of how human cognition works and how cognition is possible, its subject matter encompasses cognitive functions (such as memory and perception), the structure and use of human language, the evolution of the mind, animal cognition, 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 in the treatment of brain disorders.

The cognitive science major is intended for students wishing to enter doctor of philosophy (Ph.D.) 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 and learning disabilities; or to enter the field of human-computer interaction design; or pursue other related careers.

The Department of Psychology administers the program and student major advising.

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### PREPARATION FOR THE MAJOR

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Students who are not prepared to begin the calculus requirement should take preparatory courses offered by the mathematics and applied mathematics departments, including pre-calculus.

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### REQUIREMENTS FOR THE COGNITIVE SCIENCE MAJOR

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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 REQUIREMENTS:

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Introduction to Cognition (one of PSYC 20A or 20B)

Statistics (one of PSYC 2, AMS 5 or AMS 7/L)

Calculus (one of AMS 11A, MATH 11A, 19A or 20A)

Computer Programming (one of CMPE 13/L, CMPS 5C, 5J, 5P, 12A)

#### UPPER-DIVISION REQUIREMENTS:

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Students must complete 11 courses toward the major after completing the lower-division requirements. At least eight of these must be upper-division courses (a minimum of 42 credits). These must include Psychology 100, three upper-division core courses and three upper-division cognitive psychology electives, as described below. Students must also complete four interdisciplinary electives in other departments, which may or may not be upper-division. Students must ensure that one of the interdisciplinary electives is an upper-division course.

Psychology 100, Research Methods in Psychology (7 credits)

#### CORE COURSES

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Students must complete a course from three of the following areas:

Perception (Psychology 120 or 121)

Neuroscience (Psychology 123)

Language (Psychology 125)

Memory (Psychology 129)

#### COGNITIVE PSYCHOLOGY ELECTIVES

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Students must complete three additional upper-division Psychology courses from the following list. One of the core courses that is not used to satisfy the core courses requirement may be used to satisfy this requirement. One of these cognitive electives must be a Cognitive Senior Seminar as designated by the asterisks below.

## Cognitive Science

Any of Psychology 120-138 (i.e., the Cognitive Series)

Psychology 104, Development in Infancy

Psychology 105, Children's Thinking

Psychology 119E, The World of Babies \*

Psychology 119F, Language Development \*

Psychology 119P, Children and Technology \*

Psychology 139B, Consciousness \*

Psychology 139C, The Psychology of Lying and Deception \*

Psychology 139D, Modeling Human Performance \*

Psychology 139F, Psychology and Evolutionary Theory \*

Psychology 139G, Conversations \*

Psychology 139H, Weird Science \*

Psychology 139J, Forgetting\*

Psychology 139K, Face Recognition\*

Psychology 181, Psychological Data Analysis

Psychology 194B, Advanced Cognitive Research

Psychology 195A, Senior Thesis

Psychology 204-252, graduate cognitive courses, by petition

\*denotes Senior Seminar

### INTERDISCIPLINARY ELECTIVES

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Students must complete four interdisciplinary electives from lists of courses pre-approved by the Psychology Department, 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

Anthropology 1, 100, 101, 104, 105, 106, 109, 112, 139 (also listed in Group 3), 173, 174, 175A, 184/L, 194B, 194H, Biology: Ecology and Evolutionary Biology 20C, 109, 124/L, 129/L, 140, 141L, 147, 172/L, Biology: Molecular, Cell, and Developmental Biology 80E, 105, 120, 125, Philosophy 127 (also listed in Group 4), 190F (also listed in Group 4)

#### Group 2: Artificial Intelligence and Human-Computer Interaction

Computer Engineering 8, 9, 80A, 80U, 131, 161, 167/L; Computer Science 17, 80B, 80J, 80V, 132, 140; Computational Media 20, 80K, 146, 148; Music 80L

#### Group 3: Linguistics

Anthropology 139 (also listed in Group 1), Linguistics 50, 53, 80C, 80D, 101, 102, 105, 111 (formerly Linguistics 55), 112 (formerly Linguistics 52), 113, 116, 117, 124, 125, 140, 151, 152, 155, 157, 158

#### Group 4: Philosophy

Philosophy 9, 11, 80S, 100B (formerly Philosophy 93), 100C (formerly Philosophy 94), 121, 123, 125, 127, (also listed in Group 1), 133, 135, 137, 138, 141, 190F (also listed in Group 1), 190G, 190O, 190S

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## MAJOR QUALIFICATION REQUIREMENTS

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Students may petition to declare the cognitive science major once they have completed the lower-division requirements. For students to be admitted to the major, they must have a 2.80 or higher cumulative grade-point average (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. 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.

### COMPREHENSIVE REQUIREMENT

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UCSC 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 either a senior seminar (PSYC 139A-K, or 119E, or 119F, or 119P), or research experience (PSYC 194B, Advanced Cognitive Research, or PSYC 195, Senior Thesis).

### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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Students of every major must satisfy that majors upper-division Disciplinary Communication (DC) requirement. The DC requirement in cognitive science is satisfied by completing Psychology 100, Research Methods in Psychology, and the Senior Seminar requirement.

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## HONORS

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Honors in the cognitive science major are awarded to graduating seniors whose UCSC GPA is a 3.6 or higher in psychology courses (1-189).

Cognitive Science

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 UCSC GPA is a 3.9 or higher in psychology courses (1-189).

**COGNITIVE SCIENCE COURSE PLANNERS**

Following are two recommended academic plans for students to complete the Cognitive Science major.

Plan 1 assumes typical curriculum selections. Plan 2 assumes the maximum number of prerequisites.

<b>Plan One</b>			
<b>Year</b>	<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
1st (frsh)	MATH 2	MATH 3	Calculus
	PSYC 20	Programming	
	college core		
2nd (soph)	Interdisciplinary prerequisite	PSYC 2	PSYC 100
		Interdisciplinary prerequisite	
3rd (jr)	Cognitive core	Cognitive core	Cognitive core
	Interdisciplinary elective	Interdisciplinary elective	Interdisciplinary elective
	Cognitive elective	Cognitive elective	Cognitive elective
4th (sr)	Interdisciplinary elective	Cognitive upper-division	Cognitive upper-division

<b>Plan Two</b>			
<b>Year</b>	<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
1st (frsh)	MATH 2	MATH 3	Calculus
	PSYC 20	Programming	
	college core		
2nd (soph)	Interdisciplinary prerequisite	PSYC 2	PSYC 100
		Interdisciplinary prerequisite	Interdisciplinary prerequisite
3rd (jr)	Cognitive core	Cognitive core	Cognitive core
	Interdisciplinary prerequisite	Cognitive elective	
4th (sr)	Cognitive elective		
	Cognitive elective	Interdisciplinary elective	Interdisciplinary elective
	Interdisciplinary elective	Interdisciplinary elective	

Revised 09/09/2015

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## COLLEGE EIGHT

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2015-16 General Catalog

College Office  
(831) 459-2361

<http://eight.ucsc.edu/>

For college description and list of faculty, see [Colleges](#).

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### COLLEGE EIGHT COURSES

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#### LOWER-DIVISION COURSES

##### **10. Academic Success (2 credits). F,W,S**

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 restricted to College Eight students and by permission of college adviser. Enrollment limited to 30. The Staff

##### **20C. The Water Environment: Literature of the Sea (2 credits). \***

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. Enrollment restricted to first-year and sophomore College Eight members. Enrollment limited to 25. C. Calsoyas

##### **20D. College Students' Lives (2 credits). \***

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. Enrollment

restricted to first-year and sophomore College Eight members. The Staff

##### **20F. Justice on Earth (3 credits). \***

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. Enrollment limited to 20. The Staff

##### **20G. Peregrine Falcons Return (2 credits). W**

Required training laboratory for students who wish to pursue a hands-on, two-credit service project (laboratory or field) that is focused on peregrine falcon conservation. Enrollment limited to 26. G. Stewart

##### **28. Peer Leadership in Higher Education (3 credits). \***

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. Enrollment limited to 25. May be repeated for credit. The Staff

##### **55. College Eight: Service Learning Practicum (2 credits). F**

Introduction to service learning

theory and practice for students engaging in service-learning work in College Eight, College Eight-related projects, community service organization, or public agencies. Enrollment restricted to College Eight members. Enrollment limited to 50. (General Education Code(s): PR-S.) R. Lipschutz, S. Watrous

##### **56. Media Internships for Sustainability (2 credits). F,W,S**

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. May be repeated for credit. S. Watrous

##### **61. Education for Sustainable Living Program (2 credits). S**

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. The Staff

##### **80A. Introduction to University Discourse: Environment and Society. F**

Explores rhetorical principles and conventions of university discourse, providing intensive practice in analytical writing, critical reading, and speaking. Introduces students

## College Eight

to environmental history, ethics, and policy options, and teaches them to analyze and interpret key literary texts. Students cannot receive credit for this course and course 80B. Concurrent enrollment in course 81A is required.

Enrollment restricted to first-year college members who have not satisfied the C1 requirement.

(General Education Code(s): TA, T3-Social Sciences, C1.) The Staff

### **80B. Rhetoric and Inquiry: Environment and Society. F**

Explores the intersections of investigation, interpretation, and persuasion and hones strategies for writing and research. Introduces students to environmental history, ethics, and policy options, and teaches them to analyze and interpret key literary texts.

Students cannot receive credit for this course and course 80A.

Prerequisite(s): satisfaction of the C1 requirement; concurrent enrollment in course 81A is required. Enrollment restricted to first-year college members.

(General Education Code(s): TA, T3-Social Sciences, C2.) The Staff

### **80C. Introduction to University Discourse: Writing for Environment and Society (I). F**

Two-quarter seminar explores rhetorical principles and conventions of university discourse, providing intensive practice in analytical writing, critical reading, and speaking. Introduces students to environmental history, ethics, and policy options, and teaches them to analyze and interpret key literary texts. Students cannot receive credit for this course and course 80A or 80B. Enrollment restricted to first-year college members who have not satisfied the entry level writing requirement.

Concurrent enrollment in course 81A is required. Enrollment limited to 20. (General Education Code(s): TA.) The Staff

### **80D. Introduction to University Discourse: Writing for Environment and Society (II). W**

Two-quarter seminar explores rhetorical principles and conventions of university discourse, providing intensive practice in analytical writing, critical reading, and speaking. Introduces students to environmental history, ethics, and policy options, and teaches them to analyze and interpret key literary texts. Prerequisite(s): course 80C. Enrollment restricted to first-year college members who have not satisfied the C1 requirement. Enrollment limited to 20. (General Education Code(s): C1.) R. Lipschutz

### **81A. The Environment and Us (3 credits). F**

Takes students through a wide range of approaches to environmental citizenship and provides conceptual and practical tools to explore alternatives. Students also participate in a hands-on sustainability project designed to connect academic learning with practical applications. Concurrent enrollment in course 80A or 80B or 80C is required. Enrollment restricted to first-year college members. R. Lipschutz

### **81B. Fundamentals of Environmental Science. W**

Addresses major issues in physical and biological environmental sciences and provides tools to critically evaluate, debate, and make informed choices regarding one's own impact on the environment. Topics include: climate change, water resources, air pollution, evolution, ecology (from populations to ecosystems), and conservation. Quantitative problem solving is an integral part of this course. (Also offered as Earth Sciences 81B. Students cannot receive credit for both courses.) Prerequisite(s): courses 80A or 80B. Enrollment restricted to first-

year and sophomore college members. (General Education Code(s): MF, IN, Q.) L. Fox, P. Chuang

### **81C. Designing a Sustainable Future. S**

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. (Formerly Technological Innovation and Environmental Challenges.) (Also offered as Electrical Engineering 81C. Students cannot receive credit for both courses.) Prerequisite(s): courses 80A or 80B. Enrollment restricted to first-year and sophomore college members. (General Education Code(s): SI, T-2 Natural Sciences.) The Staff

### **82. Environment and Society in Film (2 credits). S**

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. Enrollment limited to 25. N. Schaefer

### **90. College Eight Garden Internship (1 credit). F,W,S**

One-credit internship in the College Eight Garden. Offers students of College Eight an opportunity to become involved in an experimental learning project focusing on application of concepts of sustainable agriculture. Enrollment restricted to members of College Eight. Enrollment limited to 10. May be repeated for credit. The Staff

### **93. Field Study. F,W,S** The Staff

**99. Tutorial. F,W,S**

May be repeated for credit. The Staff

**99F. Tutorial (2 credits). F,W,S**

Individual study for lower-division students directed by a faculty member affiliated with College Eight. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

UPPER-DIVISION COURSES

**128. Advanced Peer Leadership Practicum (3 credits). \***

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): course 28. Enrollment by permission of instructor. Enrollment limited to 25. May be repeated for credit. The Staff

**150A. Sustainability Praxis in the Built Environment (2 credits). F**

Introduces the concepts, methods, and practices of research on sustainable energy, water, and food production and consumption. Resources surveying and assessment; building energy auditing; renewable energy systems; water supply, demand, and distribution. Intensive agroecology is conducted at campus sites. Enrollment limited to 25. K. Monsen, K. Bell, R. Lipschutz

**150B. Tools of the Trade for Sustainability Analysis (2 credits). W**

Problem-solving in sustainability through basic STEM concepts, statistical tools, and analytical methods for engaging in advanced sustainability studies drawn from physics, chemistry, biology, ecology, engineering, electronics, sociology, economics, and public policy. Prerequisite(s): course 150A. Enrollment restricted to

sophomores, juniors, and seniors. Enrollment limited to 25. K. Bell, R. Lipschutz

**150C. Green Enterprise and Social Entrepreneurship (2 credits). S**

Teaches students how to become green entrepreneurs, develop green enterprises, and incubate green projects, especially in connection with students' research and interests. Students develop business plans; solicit participation from mentors; and prepare and submit funding proposals. Prerequisite(s): courses 150A and 150B. K. Bell, R. Lipschutz

**155. College Eight Sustainability Internship (2 credits). W,S**

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 college provost and project supervisor, and determine the content of their internship with the provost and supervisor. Enrollment restricted to College Eight members or by permission of instructor. May be repeated for credit. (General Education Code(s): PR-S.) R. Lipschutz, S. Watrous

**160. Developing Leadership to Facilitate Environmental Education. W**

Prepares students to facilitate an action research team for "Sustainable Living" (courses 61/161) during spring quarter. Workshops and training selected to build the skills and preparation to become successful facilitators. Topics include: facilitation skills; syllabus planning and curriculum building; experiential learning techniques; leadership skills; and non-violent communication training. Enrollment by interview only. Enrollment restricted to

sophomores, juniors, and seniors. Enrollment limited to 30. The Staff

**161. Education for Sustainable Living Program. S**

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. Enrollment limited to 25. The Staff

**162. Sustainability Internship Practicum. W,S**

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. Enrollment limited to 20. (General Education Code(s): PR-S.) The Staff

Enrollment limited to Sustainability Office Interns and by instructor permission; an interview, resume, and cover letter are required.

**193. Field Study. F,W,S**

**193F. Field Study (2 credits). F,W,S**

Provides for individual programs of study sponsored by the college and performed off campus. Must be sponsored by College Eight faculty. Approval of the student's adviser

## College Eight

and the academic preceptor is needed to enroll. May be repeated three times for credit. Students submit petition to sponsoring agency. The Staff

### **195. Senior Thesis. F,W,S**

May be repeated for credit. The Staff

### **198. Independent Field Study.**

**F,W,S**

The Staff

### **199. Tutorial. F,W,S**

May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

Individual study for upper-division students directed by a faculty member affiliated with College Eight. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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## COLLEGE NINE

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2015-16 General Catalog

College Office  
(831) 459-5034

<http://collegenine.ucsc.edu/>

For college description and list of faculty, see [Colleges](#).

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### COLLEGE NINE COURSES

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#### LOWER-DIVISION COURSES

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##### **70. Colleges Nine and Ten Community Garden (2 credits). F,W,S**

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. Enrollment restricted to College Nine and College Ten students. May be repeated for credit. The Staff

##### **80A. Introduction to University Discourse: International and Global Issues. F**

Explores rhetorical principles and conventions of university discourse and provides intensive practice in analytical writing, critical reading, and speaking. Topics address contemporary global issues including economic globalization, human rights, international and inter-ethnic conflicts, poverty, and immigration. Students cannot receive credit for this course and course 80B. Enrollment restricted to first-year college members who have not satisfied the C1 requirement. Enrollment limited to 22. (General Education Code(s): T3-Social Sciences, C1.) The Staff

##### **80B. Rhetoric and Inquiry: International and Global Issues. F**

Explores the intersection of investigation, interpretation, and persuasion and refines strategies for writing, research, and speaking. Topics address contemporary global issues including economic globalization, human rights, international and inter-ethnic conflicts, poverty, and immigration. Students cannot receive credit for this course and course 80A. Prerequisite(s): satisfaction of the Entry Level Writing and C1 requirements. Enrollment restricted to first-year college members. Enrollment limited to 22. (General Education Code(s): T3-Social Sciences, C2.) The Staff

##### **80C. Introduction to University Discourse: International and Global Issues Writing Intensive 1. F**

Explores rhetorical principles and conventions of university discourse and provides intensive practice in analytical writing, critical reading, and speaking. Topics address contemporary global issues including economic globalization, human rights, international and inter-ethnic conflicts, poverty, and immigration. More writing intensive

than course 80A; prerequisite to 80D. Enrollment restricted to first-year college members who have not satisfied the C1 requirement and who scored a 5 or lower on the Analytical Writing and Placement Exam. Enrollment limited to 22. The Staff

##### **80D. Introduction to University Discourse: International and Global Issues Writing Intensive 2. W**

Continues to provide practice in analytical writing, critical reading, and speaking, and to examine global issues. Prerequisite(s): course 80C. Enrollment restricted to first-year college members who have not satisfied the C1 requirement. Enrollment limited to 22. (General Education Code(s): C1.) The Staff

##### **80F. International and Global Issues (2 credits). F**

Develops each student's ability to explore their own creative output in order to convey their background, experiences, and perspectives, as well as to inspire community dialog around cultural competency and international/global issues. Enrollment is restricted to first-year College Nine students who have been placed in the Multilingual Curriculum. Enrollment limited to 25. The Staff

## College Nine

### **80L. College Nine Core Film Course (2 credits). F**

Complements the College Nine core course. The films and readings explore the theme of International and Global Perspectives and follow the core course syllabus.

Prerequisite(s): Concurrent enrollment in course 80A, 80B, or 80C. Enrollment restricted to first-year college members. The Staff

### **85. Global Action (2 credits). W**

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. Enrollment restricted to College Nine members during priority enrollment only. Enrollment limited to 20. E. Ramsden

### **86. College Leadership Development (2 credits). S**

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. The Staff

### **90. Intercultural Understanding (2 credits). F**

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. Enrollment limited to 50. The Staff

### **91. Global Issues Colloquium (1 credit). F,W,S**

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. Enrollment restricted to College Nine members. Enrollment limited to 50. May be repeated for credit. The Staff

## UPPER-DIVISION COURSES

### **105. Researching Food Sovereignty. \***

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. Enrollment restricted to junior and senior College Nine and College Ten members during priority enrollment only. Enrollment limited to 20. The Staff

### **106. Israel and Palestine: Pathways to a Deeper Understanding (2 credits). \***

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. The Staff

### **112A. Model United Nations Part A: A Group Seminar (2 credits). W**

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) Enrollment limited to 35. May be repeated for credit. The Staff

### **112B. Model United Nations Part B: International Crises (2 credits). S**

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(s): course 112A. May be repeated for credit. The Staff

### **120. Practical Activism Conference Planning and Development (2 credits). F**

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. May be repeated for credit. (General Education Code(s): PR-E.) W. Baxter

**191. Teaching Global Action. W**  
Undergraduates at upper-division level participate in teaching discussion groups for College Nine 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 restricted to College Nine juniors and seniors. E. Ramsden

College Nine

**199. Tutorial. F,W,S**

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 restricted to upper-division College Nine

members. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S**

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 restricted to upper-division College Nine members. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# COLLEGE TEN

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2015-16 General Catalog

College Office  
(831) 459-5034

<http://collegeten.ucsc.edu/>

For college description and list of faculty, see [Colleges](#).

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## COLLEGE TEN COURSES

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### LOWER-DIVISION COURSES

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**80A. Introduction to University Discourse: Social Justice and Community. F**

Explores rhetorical principles and conventions of university discourse and provides intensive practice in analytical writing, critical reading, and speaking. Examines social justice issues; topics include racism, sexism, and other forms of prejudice and discrimination; poverty and welfare; civil liberties; and community involvement and citizenship. Students cannot receive credit for this course and course 80B. Enrollment restricted to first-year college members who have not satisfied the C1 requirement. Enrollment limited to 22. (General Education Code(s): T3-Social Sciences, C1.) The Staff

**80B. Rhetoric and Inquiry: Social Justice and Community. F**

Explores the intersection of investigation, interpretation, and persuasion and refines strategies for writing, research, and speaking. Examines social justice issues; topics include racism, sexism, and other forms of prejudice and discrimination; poverty and welfare; civil liberties; and community involvement and citizenship. Students cannot receive credit for this course and course 80A. Prerequisite(s): satisfaction of the Entry Level Writing and C1 requirements. Enrollment restricted to first-year college members. Enrollment limited to 22. (General

Education Code(s): T3-Social Sciences, C2.) The Staff

**80C. Introduction to University Discourse: Social Justice and Community Writing Intensive 1. F**

Explores rhetorical principles and conventions of university discourse and provides intensive practice in analytical writing, critical reading, and speaking. Examines social justice issues. Topics include: racism, sexism, and other forms of prejudice and discrimination; poverty and welfare; civil liberties; and community involvement and citizenship. More writing-intensive than 80A; prerequisite to 80D. Enrollment restricted to first-year college members who have not satisfied the Entry Level Writing and C1 requirement and who scored a 5 or lower on the AWPE (Analytical Writing and Placement Exam). Enrollment limited to 22. The Staff

**80D. Introduction to University Discourse: Social Justice and Community Writing Intensive 2. W**

Continues to provide practice in analytical writing, critical reading, and speaking, and to examine social justice issues. Prerequisite(s): course 80C. Enrollment restricted to first-year college members who have not satisfied the C1 requirement. Enrollment limited to 22. (General Education Code(s): C1.) The Staff

**80F. Social Justice and Community (2 credits). F**

Develops each student's ability to explore their own creative output in order to convey their background, experiences, and perspectives, as well as to inspire community dialogue around social justice. Enrollment is restricted to first-year College Ten students who have been placed in the Multilingual Curriculum. Enrollment limited to 25. The Staff

**80L. College Ten Core Film Course (2 credits). F**

Complements the College Ten core course. The films and readings explore the theme of Social Justice and Community, and follow the core course syllabus. Prerequisite(s): Concurrent enrollment in course 80A, 80B, or 80C. Enrollment restricted to first-year college members. The Staff

**85. Social Justice Issues Workshop (2 credits). W**

Series of presentations, films, and workshops that address personal and cultural identity and examine social, cultural, political, environmental, and other justice concerns. Enrollment restricted to College Ten members during priority enrollment only. Enrollment limited to 20. W. Baxter

**86. College Leadership Development (2 credits). S**

Students newly appointed into leadership positions at College Ten

## 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. The Staff

### **91. Introduction to Nuclear Policy (2 credits). F**

Introduces the key aspects of nuclear policy. Examines issues associated with nuclear weapons and civil nuclear power and the interplay between the two with regards to proliferation. Presentations will be given by guest speakers. Enrollment limited to 50. May be repeated for credit. D. Hirsch

### **92. Social Justice Issues Colloquium (1 credit). F,W,S**

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. May be repeated for credit. The Staff

### **95. Nonviolent Communication (Living-Learning Community) (1 credit). F,W,S**

The Nonviolent Living-Learning Community operates in a spirit of cooperation, compassion, and good will without competition or hierarchy. Students living in the Nonviolent Living-Learning Community enroll in this course each quarter of the academic year. Restricted to residents of the Nonviolent Living-Learning Community. Enrollment limited to 25. May be repeated for credit. The Staff

### **98. Alternative Spring Break (2 credits). S**

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 by interview only. Enrollment restricted to College Nine and College Ten members. (General Education Code(s): PR-S.) A. Asher

## UPPER-DIVISION COURSES

### **105. The Making and Influencing of Environmental Policy. W**

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. (Formerly The Making and Influencing of Nuclear Policy.) Enrollment restricted to sophomore, junior, and senior College Nine and College Ten members during priority enrollment only. Enrollment limited to 35. (General Education Code(s): PE-E.) D. Hirsch

### **110. Service Learning Field Study (Esprit de Corps). F,W,S**

Provides college members the opportunity to apply their academic learning in a practical setting in the community. Students earn academic credit by volunteering in a non-profit agency or school for approximately 12 hours per week. Students supervised by a professional on site. Students attend a weekly class, complete readings, listen to local leaders from the community, reflect upon their experiences with fellow students, and submit a final project related to their service learning placement. Taught concurrently with course 110B. Enrollment by instructor consent. Enrollment restricted to sophomore, junior, and senior

College Nine and College Ten members. Students must attend an informational session to enroll. Contact: aasher@ucsc.edu for more information. Enrollment limited to 22. May be repeated for credit. (General Education Code(s): PR-S.) A. Asher

### **110B. Service Learning Field Study (Esprit de Corps) (2 credits). F,W,S**

Provides college members the opportunity to apply their academic learning in a practical setting in the community. Students earn academic credit by volunteering in a non-profit agency or school for approximately three hours per week. Students supervised by a professional on site. Students attend a weekly class, complete readings, listen to local leaders from the community, reflect upon their experiences with fellow students, and submit a final project related to their service learning placement. Taught concurrently with course 110. Enrollment by instructor consent. Enrollment restricted to sophomore, junior, and senior College Nine and College Ten members. Students must attend an informational session to enroll. Contact: aasher@ucsc.edu for more information. Enrollment limited to 22. May be repeated for credit. (General Education Code(s): PR-S.) A. Asher

### **120. Practical Activism Conference Planning and Development (2 credits). F**

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.

## College Ten

Enrollment by permission of the instructor. May be repeated for credit. (General Education Code(s): PR-E.) W. Baxter

### **191. Teaching Social Justice. W**

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 restricted to College Ten juniors and seniors. W. Baxter

### **194. Group Tutorial. F,W,S**

Independent study through which a group of students explores a particular topic in consultation with an instructor. Prerequisite(s):

Course 91 or 105 recommended. Students submit petition to sponsoring agency. Enrollment limited to 15. May be repeated for credit. D. Hirsch, The Staff

### **194F. Group Tutorial (2 credits). F,W,S**

Independent study through which a group of students explores a particular topic in consultation with an instructor. Prerequisite(s): Course 91 or 105 recommended. Students submit petition to sponsoring agency. Enrollment limited to 15. May be repeated for credit. D. Hirsch, The Staff

### **199. Tutorial. F,W,S**

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 restricted to upper-division College Ten members. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

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 restricted to upper-division College Ten members. May be repeated for credit. The Staff

Revised: 09/01/15

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# COMMUNITY STUDIES

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2015-16 General Catalog

213 Oakes Academic Building

(831) 459-2371

<http://communitystudies.ucsc.edu>

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## PROGRAM DESCRIPTION

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Founded in 1969, community studies is the oldest interdisciplinary program at UCSC. The longstanding 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 the field of experiential education and its civic engagement model has been emulated widely. Community studies was also 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 enabling them to identify, analyze, and help construct 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 expertise in specific domains of social science scholarship related to their field study. Off campus, students commit to spending six months immersed in a setting where they participate in and analyze the social justice work of an organization, with a goal of making a meaningful contribution to the organization's mission. 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 residence and participation in an organization with a social justice mission. This intensive and extended immersion 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 advisers, community studies students choose field placements related to one of 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, HIV/AIDS advocacy groups, 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 been noteworthy for being attuned and responsive to innovative field study opportunities.

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.

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## PROGRAM OVERVIEW

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Community studies is a major with a sequential core curriculum. This means that core curriculum courses must be completed in a specific order:

Fall Quarter	CMMU 10, Introduction to Community Activism
Winter (pre-field study)	CMMU 101, Communities, Social Movements, and the Third Sector
Spring	CMMU 102, Preparation for Field Study
Summer/Fall	CMMU 198, Independent Field Study (15 units per quarter)
Winter (post-field study)	CMMU 194, Analysis of Field Study

In addition to the core curriculum, students must successfully complete at least three topical courses to develop expertise in their designated emphasis (health justice and/or economic justice). Students are encouraged to take as many topical courses as possible prior to their field study. Two directed electives complete the requirements for the major, one each in the areas of race/class/privilege and regional/historical contexts. These electives are designed to ensure that all students develop knowledge of the history, culture, and political economy of the place where they will be carrying out their field study—whether that place is a neighborhood in Santa Cruz, New York City, or a small village in Guatemala—and develop a critical consciousness about their own social locations. Students must complete both directed electives **before** beginning field study.

A list of approved topical and elective courses will be posted in the program office and updated regularly on the program web site.

In sum, the program includes courses that develop a substantive focus for field study immersion, courses that contextualize the field study in wider social and geographical processes, and courses offering instruction about methods relevant to conducting and analyzing the field study experience.

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## TRANSFER STUDENTS

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The Community Studies program can easily accommodate students who transfer to UCSC for the fall quarter. To ensure a smooth transition, all transfer students should contact the Community Studies undergraduate adviser as early as possible to discuss course enrollment and declaring the major.

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## DECLARING THE MAJOR

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In order to declare the community studies major, a student must satisfactorily complete CMMU 10, Introduction to Community Activism, and at least one upper division topical course from the approved list of courses. Students may then declare the community studies major at any time, but must declare prior to enrolling in CMMU 102, Preparation for Field Study. As part of the declaration process, students meet with the program director to review their academic plan for the major, including discussion of field study possibilities, directed electives, and appropriate courses to meet the topical requirements. Students must submit their approved academic plan and declaration petition to the Community Studies staff adviser. Any change to the student's academic plan must be approved by the program director.

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## MAJOR COURSE REQUIREMENTS

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### **10, Introduction to Community Activism**

This course introduces students to different approaches to community activism including charity, volunteering, labor and community organizing, non-violent resistance, non-profit sector involvement, and media advocacy.

### **101, Communities, Social Movements, and the Third Sector**

This course critically engages with concepts central to the major including constructions of community in social-change efforts and the institutionalization of social movements in third-sector organizations. It is designed to deepen students' understanding of the opportunities and obstacles embedded in various avenues of social action.

### **102, Preparation for Field Study**

This course examines participatory and other social-research methods including participant observation, conducting interviews, writing ethnographic field notes, and collecting descriptive data. Students receive practical experience with developing research questions, methods, and writing field notes. The course also addresses ethical and logistical issues of community-based research. The final project is a literature review completed in partial satisfaction of the disciplinary communication (DC) general education requirement.

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## TOPICAL REQUIREMENTS

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Students must complete three upper-division courses in the topical area of health justice and/or economic justice from available approved courses listed below. The program director also may approve other courses,

## Community Studies

as appropriate. These 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 study. The topical requirements also permit students to work across academic disciplines by enrolling in the many fascinating topical courses offered by community studies affiliate faculty. Note that not all topical courses are offered every academic year. Check the program website for current year offerings.

### RACE, CLASS, AND PRIVILEGE ELECTIVES

These upper-division courses should examine race, class, and other hierarchies of difference as they intersect with structural inequality, self-identification, and identity politics. Students complete this requirement through a course selected from an approved list of directed electives posted on the [Community Studies program web site](#) and at the program office.

### REGIONAL/HISTORICAL ELECTIVES

Students have a choice of upper-division courses that provide historical/geographic knowledge of particular peoples, places, or regions relevant to their full-time field study. Students complete this requirement through a course selected from an approved list of directed electives posted on the [Community Studies program web site](#) and at the program office.

### **Topical Courses**

#### **Community Studies**

- CMMU 132, American Cities and Social Change
- CMMU 134, No Place Like Home
- CMMU 141, Economic Justice
- CMMU 143, Walmart Nation
- CMMU 145, Globalization and its Discontents
- CMMU 149, Political Economy of Food and Agriculture
- CMMU 156, Politics of Obesity
- CMMU 157, Ageism and Activism
- CMMU 160, Women's Health Activism
- CMMU 161, Introduction to Public Health
- CMMU 162, Community Gardens and Social Change
- CMMU 163, Health Care Inequalities
- CMMU 186, Agriculture, Food and Social Justice

#### **Anthropology**

- ANTH 134, Medical Anthropology: An Introduction
- ANTH 136, Biology of Everyday Life
- ANTH 153, Medicine and Colonialism
- ANTH 194P, Space, Place, and Culture

#### **Economics**

- ECON 180, Labor Economics
- ECON 189, Political Economy of Capitalism

#### **History**

- HIS 115A, U.S. Labor History to 1919
- HIS 115B, U.S. Labor History 1919-present
- HIS 115C, Learning from the U.S. Great Depression
- HIS 123, Immigrants/Immigration in U.S. History
- HIS 190S, Women and Social Movements in the U.S.

#### **Latin American and Latino Studies**

- LALS 166, Latino Families in Transition
- LALS 175, Migration, Gender, and Health

#### **Politics**

- POLI 120C, State and Capitalism in American Political Development
- POLI 122, Politics, Labor, and Markets in the U.S.
- POLI 124, Politics, Poverty, and Inequality in America
- POLI 190L, Poverty Politics

#### **Psychology**

- PSYC 147A, Psychology and Law
- PSYC 147B, Psychology and Law
- PSYC 149, Community Psychology: Transforming Communities
- PSYC 153, Psychology of Poverty and Social Class
- PSYC 155, Social-Community Psychology in Practice
- PSYC 159H, Community-based Interventions

#### **Sociology**

- SOCY 122, Sociology of Law
- SOCY 127, Drugs in Society
- SOCY 131, Media, Marketing, and Culture
- SOCY 176A, Work and Society
- SOCY 177, Urban Sociology
- SOCY 177E, Eco-Metropolis: Research Seminar in Urban and Environmental Studies
- SOCY 177G, Global Cities

#### **198, Full-Time Independent Field Study**

During the full-time, six-month field study, students are enrolled at UCSC and receive full-time university credit. Students are required to submit field notes and several analytical essays during the field study. Students are guided by a campus faculty adviser and on-site organization supervisor.

#### **194, Analysis of Field Materials**

This course is designed for students returning from their full-time field study and has two related goals: (1)

## Community Studies

to help students, both individually and collectively, analyze and gain perspective on their field experiences; and (2) to facilitate completion of the senior capstone requirement. Students work with their field material to develop findings and arguments and connect those to relevant theoretical literature(s). Then, in a series of discussion forums, they use their analyses to confront those issues that most forcefully challenge social justice work in the contemporary moment. The written work of 194 completes the DC requirement.

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### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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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 course 102 and course 194.

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### SENIOR CAPSTONE REQUIREMENT

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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 adviser, 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 course 194, Analysis of Field Materials.

**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 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 course 194 will become the foundation for the thesis, whether as a template to be elaborated or as one or more chapters of the completed thesis.

**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 Community Studies 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.

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### HONORS IN THE MAJOR

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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.

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### PROGRAM LEARNING OUTCOMES

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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.

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### CRITICAL THINKING

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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.

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### COMMUNITY ENGAGEMENT

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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.

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## COMMUNITY STUDIES FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**William H. Friedland, Emeritus**

**Nancy Stoller, Emerita**

**David T. Wellman, Emeritus**

**Carter Wilson, Emeritus**

**Deborah A. Woo, Emerita**

### LECTURER

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**Leslie Lopez**

Political economy of education and cultural production, social movements in Latin America/U.S., journalism and oral history, literacy and language, immigration, youth

**Andrea Steiner**

Health policy, critical public health, social gerontology, ageism, women's health activism, numeracy education in social justice



### PROFESSOR

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**David Brundage (History)**

American immigration history, with particular focus on the Irish in America and on transnational immigrant politics; U.S. labor and social history; modern Irish history

**Heather E. Bullock (Psychology)**

Poverty and economic inequality, welfare policy, feminist psychology, intersections of classism, racism, and sexism

**Nancy N. Chen (Anthropology)**

Medical anthropology, visual anthropology, urban anthropology, Asian American identity, mental health, food, China

**Dana Frank (History)**

Late 19th- and 20th-century U.S. social history, including women's, labor, and working-class history, race and ethnicity; modern Honduras; U.S. history in transnational perspective

**Julie Guthman (Social Sciences)**

Sustainable agriculture and alternative food movements, international political economy of food and agriculture, politics of obesity, political ecology, race and food, critical human geography

**Craig W. Haney (Psychology)**

Applications of social psychological principles to legal settings, assessment of the psychological effects of living and working in institutional environments, social contextual origins of violence, development of alternative legal and institutional forms

**David E. Kaun, Emeritus**

**Regina D. Langhout (Psychology)**

School-community-university collaboration; how schooling and neighborhood experiences are informed by social class, race, and gender; young people and empowerment; participatory action research

**Craig Reinerman (Sociology)**

Political sociology; law, crime, and social justice; drugs and society

**Patricia Zavella, (Latin American and Latino Studies)**

Transnational migration by Mexicans, poverty, family, sexuality, labor, social networks, feminist studies, Chicana/o-Latina/o studies, ethnographic research methods

### ASSOCIATE PROFESSOR

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**Eva Bertram, (Politics)**

American politics, public policy, political economy, and political history, including social policy and the welfare state, and the changing character of work and labor markets in the United States.

**Miriam Greenberg (Sociology)**

Urban sociology, media studies, cultural studies, political economy, globalization, and urban political ecology

**Steven McKay (Sociology)**

Work and labor markets; globalization and social change; political sociology; race; masculinity; migration; ethnography/qualitative methods

**Mary Beth Pudup (Social Sciences)**

Urban and regional political economy, historical geography of the U.S., public policy, community gardening and urban agriculture, non-profit sector

### ASSISTANT PROFESSOR

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**Matthew Wolf-Meyer (Anthropology)**

Anthropology and history of medicine and public health, science studies, American studies, popular culture, the United States and the United Kingdom

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## COMMUNITY STUDIES COURSES

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### LOWER-DIVISION COURSES

**10. Introduction to Community Activism. F**

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. (General Education Code(s): IS.) L. Lopez

**42. Student-Directed Seminar. F,W,S**

Seminars taught by upper-division or graduate students under faculty supervision. (See course 192.) The Staff

**93. Field Study. F,W,S**

Supervised work in a community-based setting conducted under the guidance of a faculty member. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**93F. Field Study (2 credits). F,W,S**

Supervised work in a community-based setting conducted under the guidance of a faculty member. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**93G. Field Study (3 credits). F,W,S**

Supervised work in a community-based setting conducted under the guidance of a faculty member. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**99. Tutorial. F,W,S**

Individual directed study for lower-division undergraduates. May be repeated for credit. The Staff

**99F. Tutorial (2 credits). F,W,S**

Individual directed study for lower-division undergraduates. May be repeated for credit. The Staff

### UPPER-DIVISION COURSES

**101. Communities, Social Movements, and the Third Sector. W**

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. The Staff

**102. Preparation for Field Studies. S**

A practicum to prepare students for field study. Course must be successfully completed prior to the six-month field study.

Prerequisite(s): course 10; course 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. A. Steiner

**103. Field Study Practicum (2 credits). S**

A practicum in social change work in which the students works for a social change organization on a part-time basis. Concurrent enrollment in course 102 required. A. Steiner

**132. American Cities and Social Change. S**

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. M. Pudup

**133. Making California: Landscapes, People, Politics, Economy. \***

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. J. Guthman

**134. No Place Like Home. \***

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. Enrollment limited to 30. M. Pudup

**141. Economic Justice. F**

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. (General Education Code(s): E.) M. Pudup

**143. Wal-Mart Nation. \***

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. M. Pudup

**145. Globalization and Its Discontents. \***

Provides an overview of the origins and existing character of major institutions, structures, and dynamics of the global political economy. Examines some social consequences of neoliberalism as well as political responses to it. J. Guthman

**149. Political Economy of Food and Agriculture. \***

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. (General Education Code(s): PE-E.) J. Guthman

**151. Sex, Race, and Globalization. \***

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. (General Education Code(s): E.) The Staff

**156. Politics of Obesity. \***

Critically examines the construction and representation of the so-called epidemic of obesity, the major explanations for the rise in obesity

and the interventions they beget, and the implications of naming obesity as a problem. (Formerly course 145.) (General Education Code(s): PE-H.) J. Guthman

**157. Ageism and Activism. \***

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. A. Steiner

**160. Public Health. F**

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. A. Steiner

**161. Women's Health Activism. \***

Examines concrete aspects of women's health in social and political contexts, including such factors as environmental and occupational health, the role of race and nationality, diverse sexualities and health, American medical care systems, and international comparisons and organizing approaches. A. Steiner

**162. Community Gardens and Social Change. \***

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. M. Pudup

**163. Health Care Inequalities. \***

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. A. Steiner

**164. Health Justice in Conflict. W**

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. J. Rubaii

**186. Agriculture, Food, and Social Justice. \***

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. Enrollment by permission of instructor. J. Guthman

**189. Methods of Teaching Community Studies. F,W,S**

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. The Staff

## Community Studies

### **191. Student Volunteer Internship (3 credits). F,W,S**

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 by permission of instructor after application and interview. Enrollment limited to 15. (General Education Code(s): PR-S.) A. Steiner

### **192. Directed Student Teaching. F,W,S**

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. The Staff

### **193. Field Study. F,W,S**

Supervised work in a community-based setting conducted under the guidance of a faculty member. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **193F. Field Study (2 credits). F,W,S**

Supervised work in a community-based setting conducted under the guidance of a faculty member.

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **193G. Field Study (3 credits). F,W,S**

Supervised work in a community-based setting conducted under the guidance of a faculty member. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **194. Analysis of Field Materials. W**

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. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, course 198. Enrollment restricted to community studies majors. (General Education Code(s): W.) The Staff

### **195A. Senior Thesis. F,W,S**

Individual study with a faculty member to complete the senior thesis. The Staff

### **195B. Senior Thesis. F,W,S**

Individual study with a faculty member to complete the senior thesis. The Staff

### **195C. Senior Thesis. F,W,S**

Individual study with a faculty

member to complete the senior thesis. The Staff

### **198. Independent Field Study. F**

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): course 102. May be repeated for credit. (General Education Code(s): PR-S.) M. Pudup

### **199. Tutorial. F,W,S**

Advanced directed reading and research for the serious student. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

Advanced directed reading and research for the serious student. May be repeated for credit. The Staff

## GRADUATE COURSES

### **297. Independent Study. F,W,S**

Either study related to a course being taken or a totally independent study. Designed for graduate students. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised 09/01/15

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# COWELL COLLEGE

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2015-16 General Catalog

College Office  
(831) 459-2253

<http://cowell.ucsc.edu/>

For college description and list of faculty, see [Colleges](#).

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## COWELL COLLEGE COURSES

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### LOWER-DIVISION COURSES

#### **10. Becoming a Successful Student (2 credits). \***

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. Enrollment restricted to college members, or by permission of instructor. Enrollment limited to 15. The Staff

#### **12. Public Speaking (2 credits). W**

Introduces students to the theory and practice of formal and informal public speaking through composition, presentation, and evaluation of informative reports, persuasive speech, introductory remarks, panels, and extemporaneous speech. Enrollment restricted to college members during priority enrollment. Enrollment limited to 20. C. Carlstroem

#### **39. Brain, Mind, and Consciousness. W**

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. The Staff

#### **40. Near-Death Experiences: Evidence and Inference in the Post-Modern World. F**

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. Enrollment limited to 30. The Staff

#### **42. Student-Directed Seminar. \***

Seminars taught by upper-division students under faculty supervision. (See course 192.) The Staff

#### **50. Library Skills for the Digital Age (2 credits). \***

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. Enrollment restricted to first-year and sophomore college members, or by permission of instructor. Enrollment limited to 22. The Staff

#### **52. Personal Finance and Investing (2 credits). S**

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. Enrollment limited to 30. The Staff

#### **61. Critical Journeys (2 credits). \***

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(s): course 80A or 80B; enrollment restricted to college members. Enrollment limited to 20. J. Wilson, C. Carlstroem

#### **64. Social Justice: Issues and Debates (2 credits). \***

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). Enrollment restricted to first-year students. Enrollment limited to 20. J. Christianson

#### **65. Love and Wisdom. S**

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.

Enrollment limited to 25. (General Education Code(s): IM.) The Staff

**70A. Introduction to Book Arts.**

**F**

Students learn techniques of bookbinding, construction, and design, and fundamentals of letterpress printing. Enrollment by permission of instructor. Students are billed a materials fee. (Formerly Bookbinding.) Enrollment limited to 10. (General Education Code(s): A.) G. Young

**70B. Intermediate Book Arts. W**

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. Students are billed a materials fee. (Formerly Printing I: Elements of Printing.)

Prerequisite(s): course 70A or by permission of instructor. Enrollment limited to 12. (General Education Code(s): A.) G. Young

**70C. Advanced Book Arts. S**

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. Students are billed a materials fee. (Formerly Printing II: Typography and Book Design.) Prerequisite(s): course 70B or by instructor permission. Enrollment limited to 12. May be repeated for credit. (General Education Code(s): A.) G. Young

**80A. Introduction to University Discourse: Imagining Justice Past and Present. F**

Explores rhetorical principles and conventions of university discourse, providing intensive practice in analytical writing, critical reading,

and speaking. Focuses on conceptions of justice, historic and contemporary, and considers how literary and artistic media may transmit, question, or revise notions of the just. Students cannot receive credit for this course and course 80B. Enrollment restricted to first-year college members who have not satisfied the C1 requirement. Enrollment limited to 22. (General Education Code(s): T4-Humanities and Arts, C1.) The Staff

**80B. Rhetoric and Inquiry: Imagining Justice Past and Present. F**

Explores the intersections of investigation, interpretation, and persuasion and hones strategies for writing and research. Focuses on conceptions of justice, historic and contemporary, and considers how literary and artistic media may transmit, question, or revise notions of the just. Incorporates independent research. Students cannot receive credit for this course and course 80A. Prerequisite(s): satisfaction of the Entry Level Writing and C1 requirements. Enrollment restricted to first-year college members. Enrollment limited to 22. (General Education Code(s): T4-Humanities and Arts, C2.) The Staff

**83. The Modern Metropolis: Paris, London, New York 1770-1860. \***

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. Enrollment is restricted to Cowell and Crown Honors students. Enrollment limited to 30. (General Education Code(s): CC.) B.

Thompson

**84. Chinese Approaches to Human Values. \***

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. Enrollment restricted to Cowell and Crown Honors students. Enrollment limited to 28. (General Education Code(s): CC.) R. Birnbaum

**85. Introduction to Chinese Writing Systems. \***

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. D. Keenan

**86. College Leadership Development (2 credits). S**

Students newly appointed as residential life assistants in the college prepare for taking up their positions by studying identity and diversity issues; student development; community building; conflict resolution; intercultural competency; and leadership skills. Restricted to students selected for Cowell College Resident Assistantship, and by permission of instructor. May be repeated for credit. The Staff

**87. The History of Time. W**

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. Enrollment restricted to

Cowell and Crown Honors students. Enrollment limited to 22. (General Education Code(s): CC.) M. O'Hara

**89. Faculty Research Colloquium (2 credits). S**

Introduction of UCSC as a research university, our notable researchers, and their work. Weekly discussions with UCSC faculty from a variety of disciplines. Enrollment restricted to participants in the first-year honors program. M. O'Hara

**93. Field Study. F,W,S**

Various topics to be arranged. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**93F. Field Study (2 credits). F,W,S**

Various topics to be arranged. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**94. Group Tutorial. F,W,S**

A program of independent study arranged between a group of students and a faculty instructor. Students submit petition to sponsoring agency. Enrollment limited to 10. May be repeated for credit. The Staff

**94F. Group Tutorial (2 credits). F,W,S**

A program of independent study arranged between a group of students and a faculty instructor. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**99. Tutorial. F,W,S**

Various topics to be arranged. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**99F. Tutorial (2 credits). F,W,S**

Various topics to be arranged.

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**UPPER-DIVISION COURSES**

**107. Trust Rules: How to Tell the Good People from the Bad (2 credits). F**

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. (Formerly Trust Rules: How to Tell Good People from Bad People in Work and Life.) Enrollment restricted to college members or by permission of instructor. Enrollment limited to 20. The Staff

**110. Introduction to Mock Trial (2 credits). S**

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. Enrollment restricted to college members. D. Robertson

**111. Mock Trial Workshop (2 credits). W**

Reserved for the Mock Trial team to practice arguments and refine techniques for the competition nationwide. Students drilled on the

case from both the perspective of the defense and of the offense. Direct examination and cross examination strategies explored, and practice given in witness testimony. Enrollment limited to 20. May be repeated for credit. D. Robertson

**118B. Words & Music: Poetry, Musical Theater, Opera. \***

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.) May be repeated for credit. (General Education Code(s): IH.) The Staff

**126. The Trajectory of Justice in America: Eight Cases that Changed the U.S.. \***

Reviews changing concepts of justice in constitutional law cases that changed the United States politically and socially. These cases include the Pentagon Papers, the Watergate burglary, Karen Silkwood, the American Sanctuary Movement, and Iran-Contra. (Also offered as Philosophy 155. Students cannot receive credit for both courses.) D. Sheehan

**138A. The Place of Higher Education in a Democratic Society. S**

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(s): course 80A or 80B. Enrollment limited to 20. (General Education Code(s): PE-H.) F. Crosby

**138B. Life Development (2 credits). \***

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(s): course 80A or 80B. Enrollment limited to sophomore, junior, and senior Cowell College members. Enrollment limited to 40. F. Crosby

**156M. Medical Ethics and Justice in Literature and Film. \***

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. (Formerly Arts and Sciences.) Enrollment limited to 15. May be repeated for credit. D. Schultz

**158A. Special Topics: Oral History. \***

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. Enrollment restricted to sophomore, junior, and senior college members. Enrollment limited to 25. The Staff

**161Y. Modern Ancient Drama. \***

Studies 20th- and 21st-century productions and adaptations of ancient Greek drama in theater, dance, music, and film, including Stravinsky, O'Neill, Graham, Pasolini, and Breuer, discussing artists' goals, the sociopolitical context, ideas of authenticity, and audience response. (Also offered as Theater Arts 161Y. Students cannot receive credit for both courses.) Enrollment limited to 30. (General Education Code(s): A.) The Staff

**168. Social Change (2 credits). F,W,S**

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. Enrollment restricted to college members. May be repeated for credit. (General Education Code(s): PR-S.) D. Baldini

**184A. Leadership and Institution Building (2 credits). F**

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 restricted to undergraduates accepted in the Chancellor's Undergraduate Internship Program. Enrollment limited to 40. (General Education Code(s): PR-S.) R. Hughey

**184B. Leadership and Institution Building (2 credits). W**

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 restricted to undergraduates accepted in the Chancellor's Undergraduate Internship Program. Enrollment limited to 40. (General Education Code(s): PR-S.) R. Hughey

**184C. Leadership and Institution Building (2 credits). S**

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 restricted to undergraduates accepted in the Chancellor's Undergraduate Internship Program. Enrollment limited to 40. (General Education Code(s): PR-S.) R. Hughey

**192. Directed Student Teaching. \***

Teaching of a lower-division seminar under faculty supervision. (See course 42.) Upper-division standing required and a proposal supported by a faculty member willing to supervise. The Staff

**193. Field Study. F,W,S**

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 restricted to juniors and seniors. May be repeated for credit. The Staff

**193F. Field Study (2 credits).  
F,W,S**

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 restricted to juniors and seniors. May be repeated for credit. The Staff

**194. Group Tutorial. F,W,S**

A program of independent study arranged between a group of students and an instructor. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**194F. Group Tutorial (2 credits). F,W,S**

A program of independent study arranged between a group of students and an instructor. Students submit petition to sponsoring agency. Enrollment restricted to juniors and seniors. May be repeated for credit. The Staff

**195. Senior Thesis. F,W,S**

Students submit petition to sponsoring agency. The Staff

**198. Independent Field Study.  
F,W,S**

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. May be repeated for credit. The Staff

**199. Tutorial. F,W,S**

Various topics to be arranged. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S**

Various topics to be arranged. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# CRITICAL RACE AND ETHNIC STUDIES

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2015-16 General Catalog

416 Humanities I

(831) 459-2757

<http://cres.ucsc.edu/>

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## PROGRAM DESCRIPTION

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Critical Race and Ethnic Studies (CRES) majors develop a deep understanding of how race and other modalities of power have structured human life in the past and the present. Students acquire an understanding of the historical production of race and ethnicity in the United States and across the globe. They learn how the contours of race and racism have changed over time and, concomitantly, how individuals and groups have experienced these phenomena in constantly morphing ways. Students examine present-day 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 also explore the ways that race and ethnicity have developed in concert with gender, sexuality, class, indigeneity, citizenship, and other modalities of power and lived identity.

CRES majors make critical use of methods and concepts from different academic disciplines as a means of better understanding historical and contemporary social phenomena and problems. In the process, they learn to recognize both the limits and the value of established knowledge production practices. The configuration of the major allows students flexibility at the upper division to design a course of study that enables a general understanding of a range of issues of intellectual and professional interest and/or a deeper understanding of a key area of focus.

Through their immersion in a program of study that is multidisciplinary, comparative, and transnational in scope, CRES majors develop a critical, situated perspective on the rights, responsibilities, and privileges of being a citizen of the United States or residing in its borders in the 21st century. 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, complicated, and culturally diverse world.

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## PROGRAM LEARNING OUTCOMES

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Students who complete the CRES major should emerge with the following skills competencies, and knowledge:

### **Outcome 1**

Critical Frameworks: Historical and contemporary perspectives on race and ethnicity; intersectional understanding of race and ethnicity; familiarity with different disciplinary methods applied to race and ethnicity; facility with theoretical approaches to studying race and ethnicity.

### **Outcome 2**

Community Collaboration, Engagement, and Activism: Understanding of the university as one of many sites of the production of knowledge and power; familiarity with social and cultural movements; understanding of the ethical and intellectual issues surrounding activist, collaborative and community-based research projects; ability to design and implement a collaborative research project.

### **Outcome 3**

Research and Writing Proficiency: Ability to account for other people's arguments; capacity to create an argument around one's own research; ability to formulate and defend one's own arguments in the context of the relevant state of the field of Program Learning Outcomes.

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## REQUIREMENTS FOR THE MAJOR

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To apply for the major, students must have completed CRES 10, with a C or better, in order to declare the major. Junior transfer students and students in exceptional circumstances may substitute an equivalent course with the director's approval. Students must submit a proposed study plan to the program adviser that meets the major requirements in a coherent manner. Students are urged to submit their study plan no later than the third quarter of their sophomore year or, in the case of transfer students, no later than the first quarter of their junior year. The study plan should reflect a commitment to take CRES 100 and 101 at the next possible opportunity.

## DISCIPLINARY COMMUNICATIONS (DC) REQUIREMENT

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Students of every major must satisfy that major's upper division Disciplinary Communication (DC) requirement. The DC requirement in CRES is satisfied by completing CRES 190.

## COURSE REQUIREMENTS

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To graduate with a major in CRES, a student is required to complete 10 courses with the approval of the program.

- One lower-division foundation course: CRES 10
- Two upper-division foundation courses: CRES 100 and CRES 101
  - Students may petition to substitute a department-based community engagement course for CRES 101.
- At least six upper-division electives offered by other departments, from the list of CRES-approved courses.
  - At least two electives must be from the list of designated courses focusing on phenomena outside of the US or on transnational or hemispheric subjects.
  - At least two academic divisions must be represented in the elective coursework.
  - Students are encouraged to take more than the minimum number of elective courses. They may elect to craft an elective distribution from several areas of specific research and career interests. Or, they may wish to take a number of elective courses in a particular area 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.)
- Capstone research seminar: CRES 190

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.

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## GRADUATE PROGRAM

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### DESIGNATED EMPHASIS

#### Requirements for the Designated Emphasis

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Graduate students from other departments may obtain a designated emphasis in CRES by completing the following requirements in addition to the requirements for the doctorate in their home department:

- The student must have a designated graduate adviser from the CRES program principal or affiliated faculty. The student must meet with this CRES adviser 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 graduate director.
- A member of the CRES principal or affiliate faculty (usually the CRES graduate adviser) must serve on the student's qualifying examination committee and/or on the student's dissertation committee.
- 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 adviser will determine whether a particular piece of writing meets this requirement.
- The student must take four relevant graduate seminars taught by CRES program faculty. One relevant graduate seminar taught by non-program faculty may be counted with the approval of the CRES adviser. The adviser 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.

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.

#### Proposing and Obtaining the Designated Emphasis

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Once a plan for meeting the requirements is agreed upon, the student should complete the application, obtain the CRES adviser's and graduate director's

## Critical Race and Ethnic Studies

signatures, and submit the application to the CRES program 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 Program office for final approval by the CRES graduate director. At a minimum, the student should submit copies of the

qualifying examination and/or Dissertation Committee Nomination forms and a note from the adviser 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 program will notify the student and the home department of approval for the designated emphasis.

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## CRITICAL RACE AND ETHNIC STUDIES FACULTY AND PROFESSIONAL INTERESTS

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### PRINCIPAL FACULTY

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#### **Felicity Amaya Schaeffer, Feminist Studies**

Transnational feminisms; sexuality and migration, technology, and race; intimacy and globalization; Latin American/Latino studies; border studies; Chicana/o studies; biometrics and security studies

#### **Neda Atanasoski, Feminist Studies**

New media and film; critical race and ethnic studies; feminist theory; human rights and humanitarianism; war and nationalism; religion and secularism; post-socialist politics and culture in Central and Eastern Europe

#### **Vilashini Cooppan, Literature**

Postcolonial studies; comparative and world literature; literatures of slavery and diaspora; globalization studies; cultural theory of race and ethnicity

#### **Christine Hong, Literature**

Asian American literature and cultural criticism; African American literature and black freedom studies; Korean diasporic cultural production; Pacific Rim studies; postcolonial theory; critical race theory; human rights discourse; law and literature; narrative theory; film and visual studies

#### **Steve McKay, Sociology**

Work and labor markets; globalization and social change; political sociology; race; masculinity; migration; ethnography/qualitative methods

#### **Nick Mitchell, Feminist Studies**

Black feminist thought and praxis; critical theory; critical university studies; epistemology and discipline formation; feminist theory; intellectual history

#### **Marcia Ochoa, Feminist Studies**

Gender and sexuality, race and ethnicity, Latina/o studies, media and cultural studies, ethnography of media, feminism, queer theory, geography, multimedia production, graphic design, colonialism and modernity, Latin American studies—Colombia and Venezuela, social documentation

#### **Juan Poblete, Literature**

Latin(o) American literatures; transnational/global cultures (literature, radio, film); Latin(o) American cultural studies; 19th-century studies; the history of reading practices

#### **Eric Porter, History/History of Consciousness**

Black cultural and intellectual history; U.S. cultural history and cultural studies; critical race and ethnic studies; jazz and popular music studies; urban studies

#### **Karen Yamashita, Literature**

History and anthropology of Japanese immigration to Brazil; Asian American literature; modern fiction; playwriting

#### **Alice Yang, History**

Historical memory, Asian American history, gender history, race and ethnicity, 20th-century U.S., oral history



#### **Mark Anderson, Anthropology**

Racial formation, diaspora, nationalism, transnationalism, culture and power; Latin America, African diaspora

#### **David Anthony, History**

African and African American history, art, music, literature, and cinema; eastern and southern Africa; African languages; Indian Ocean world; African and African American linkages; Islamic civilization; African diaspora studies; world history

#### **Bettina Aptheker, Feminist Studies**

Feminist oral history and memoir; feminist pedagogy; African American feminist history; queer studies; feminist Jewish studies; feminist critical race studies

#### **Anjali Arondekar, Feminist Studies**

South Asian studies, colonial historiography; feminist theories; queer theory; critical race studies; 19th-century interdisciplinary studies

**Gabriela Arredondo, Latin American and Latina/o Studies**

Latina/o studies; Chicana/o history; U.S. immigration histories; U.S. social and cultural history; critical race and ethnicity theories; Chicana and Mexicana feminisms; "borderlands" studies; history of modern Mexico

**Noriko Aso, History**

Japanese social, intellectual, and cultural history, material culture, colonialism, nationalism, gender, race and ethnicity

**Karen Bassi, Literature**

Greek and Latin literatures; gender; literary and cultural theory; pre- and early modern studies; historiography; visual and performance studies

**Dorian Bell, Literature**

Nineteenth- and 20th-century French literature and intellectual history; histories of empire and anti-Semitism; literature and science; film studies; digital humanities

**Martin Berger, History of Art and Visual Culture**

Gender, race, and representation in U.S. culture

**David Brundage, History**

American immigration history, with particular focus on the Irish in America and on transnational immigrant politics; U.S. labor and social history; modern Irish history

**Christopher Chen, Literature**

Twentieth- and 21st-century African American literature; Asian American literature; 20th and 21st-century US multiethnic poetry and poetics; comparative ethnic literary studies; literary formalisms and comparative racialization; contemporary experimental poetics and political theory

**Nancy Chen, Anthropology**

Medical anthropology, visual anthropology, urban anthropology, Asian American identity, mental health, food, China

**Alan Christy, History**

Early modern and modern Japan; history of social sciences, colonialism, nationalism

**Chris Connery, Literature**

World literature and cultural studies; globalism and geographical thought; the 1960s; Marxism; pre-modern and modern Chinese cultural studies; cultural revolution

**Cynthia Cruz, Education**

Feminist ethnography; community-based learning; decolonial pedagogies; LGBTQ street youth; women of color thought; cultural studies and education

**Jon Daehnke, Anthropology**

Archaeology of the North American Pacific Coast, cultural heritage politics and law, contemporary Native American politics, human-environment interaction, landscape and place, collaborative methodologies, NAGPRA implementation and compliance, public representations of heritage and memory

**Grace Peña Delgado, History**

Chicano/a History; Mexico-US-Canadian Borderlands; Latino/a Studies; Asian and Asian American Studies; Immigration; Gender and Sexuality; Modern Mexico and Latin America

**Gina Dent, Feminist Studies**

Africana literary and cultural studies, legal theory, popular culture

**Jennifer Derr, History**

Colonial and Post-colonial Middle Eastern history; Egypt; agricultural and environmental history; Ottoman history; spatial politics; African history; Islamic history

**Nathaniel Deutsch, History**

Modern Jewish history; Eastern European Jewish culture; ethnography, Hasidism; history of religions

**Maria Elena Diaz, History**

Atlantic world, Colonial Latin America and the Caribbean, Cuba; social and cultural, global and local histories; colonialism, slavery and freedom, race/ethnicity, gender and class; legal, political, popular, and religious culture

**Sylvana Falcón, Latin American and Latina/o Studies**

Human rights activism, racism/antiracism, globalization, gender, transnational feminism, contemporary Peru

**Adrián Félix, Latin American and Latina/o Studies**

International migration; Mexico-U.S. migration; migrant transnationalism; racial/ethnic politics and identity; politics of citizenship; Latino politics

**Dana Frank, History**

Late 19th- and 20th-century U.S. social history; women's, labor, and working-class history; race and ethnicity/modern Honduras; U.S. history in transnational perspective

**Carla Freccero, Literature**

Renaissance studies; French and Italian language and literature; early modern studies; postcolonial theories and literature; contemporary feminist theories and politics; queer theory; U.S. popular culture; posthumanism; animal studies

**Rosa-Linda Fregoso, Latin American and Latina/o Studies**

Human rights, femicide, and violence studies; critical and cultural theories; decolonial and intercultural feminist studies; media and visual studies

**Hiroshi Fukurai, Sociology**

Citizen participation in law, race and the law, indigenous approach to international law, decolonialism, Japan and East Asia, advanced quantitative methods, survey research

**K.C. Fung, Economics**

International trade and finance, WTO, foreign direct investment, global environmental economics, and Asia/Pacific economies

**Susan Gillman, Literature**

Nineteenth-century American literature and culture; theories of culture, race, and gender; world literature and cultural studies

**Jennifer González, History of Art and Visual Culture**

Contemporary theories of visual culture, semiotics, critical museum studies, photography, public and activist art in the U.S.

**Herman Gray, Sociology**

Cultural studies, media and television studies, black cultural politics, social theory

**Kirsten Silva Gruesz, Literature**

Transnational Americas studies; Chicano/Latino literatures and cultures; 19th-century U.S. and Latin American literature; poetry; history of the book; reading and literacy; bilingualism

**Lisbeth Haas, History**

U.S.-Mexico borderlands and border studies, Chicano and Native American history; visual culture in the colonial Americas; California; historical memory, theory, and historical methodology

**Karlton Hester, Music**

Premeditated, electroacoustic, and spontaneous composition; flutes, saxophones, and interdisciplinary performance; improvisational and Afrocentric music theory, analysis and history. Artistic Director, Global African Music and Arts Festival/Symposium; UCSC/ISIM International Improvisation Festival/Conference

**Catherine Jones, History**

U.S. civil war and Reconstruction; slavery and emancipation; the American South; history of children; history of education; women and gender

**L.S. Kim, Film and Digital Media**

Television history and theory, racial discourse, feminist criticism, Asian-American cultural theory and

production, industrial practices and social change in both mainstream Hollywood and alternative media

**Regina Langhout, Psychology**

School-community-university collaboration; how schooling and neighborhood experiences are informed by social class, race, and gender; young people and empowerment; participatory action research

**Kimberly Lau, Literature**

Feminist theory; fairy tale studies; virtual worlds; social fictions; discourse analysis and ethnographic methods

**Amy Lonetree, History**

Indigenous history; museum studies; memory and history; Native American cultural production; public history; and Ho-Chunk tribal history

**Boreth Ly, History of Art and Visual Culture**

Visual cultures of Southeast Asia and its diaspora: religions and materiality, theory of visual narrative, the politics of cultural translation; (post) colonial and cultural studies; issues of gender, sexuality, race, and trauma

**David Marriott, History of Consciousness**

Poetics, black cultural studies, literary and psychoanalytic theory, visual culture studies, black cultural theory and philosophies of race, caribbean modernism, Fanon studies

**Marc Matera, History**

Britain and the British Empire; Modern Europe; world history; Atlantic World; western Africa; African diaspora studies; colonialism; race/ethnicity, gender, and sexuality

**Lourdes Martinez-Echazabal, Latin American and Latina/o Studies**

Latin American and Caribbean literatures; Afro-Latin American literatures, cultures, and societies; found[n]ational narratives; Brazilian literature; literatures of Cuba and the Cuban diaspora; critical race theory

**Derek Murray, History of Art and Visual Culture**

Theory and criticism of contemporary art, cultural theory, identity and representation, art of the African diaspora, popular visual culture, contemporary photography, and the ethics of art history and visual studies

**Matthew O'Hara, History**

Colonial and modern Latin America; Mexico; religion; race, ethnicity, and identity; political culture; history of time

**Greg O'Malley, History**

Slavery and the slave trade; the colonial Americas; the Atlantic World; race, ethnicity, and encounters; Native American history; revolutionary America

**Hector Perla, Latin American and Latina/o Studies**

International relations; Latin American studies; Latino politics; 21st-century left in Central America; U.S. foreign policy; social and revolutionary movements; asymmetric conflicts; political psychology; transnational political mobilization

**Catherine Ramírez, Latin American and Latina/o Studies**

United States cultural history, with a focus on immigration and assimilation; theories of citizenship; Latino literature; comparative ethnic studies; feminist and gender studies; cultural studies

**Jennifer Reardon, Sociology**

Science studies; sociology of science, technology, and medicine; feminist theory; race/ethnicity/gender/sexuality/class; biology and society

**Cecilia Rivas, Latin American and Latina/o Studies**

Transnationalism; media and communication (Internet, newspapers); migration; globalization; race, ethnicity, and gender; bilingualism; consumption; El Salvador, Central America, Southern Mexico

**Vanita Seth, Politics**

Early modern and modern political theory, feminist theory, cultural history, race politics, postcolonial theory

**Nirvikar Singh, Economics**

Industrial organization, political economy, economic

development, technology and innovation, South Asian immigrants in the U.S., Indian economy, Sikhs and the Punjab

**Yiman Wang, Film and Digital Media**

Theory of difference; film history and theory; colonial/semi-colonial/postcolonial/postsocialist modes of media production and exchange; border-crossing film remakes; silent cinema; translation theory and cinema; acting theory/practice and ethnic star studies with focus on Anna May Wong; transnational connections and ramifications of Chinese cinema and documentary; fan culture; East Asian cinemas

**Lewis Watts, Professor Emeritus, Art**

**Marilyn Westerkamp, History**

Colonial and revolutionary America; the Atlantic World; early modern cultural and religious history; U.S. religious history; gender studies; history of the body

**Ronaldo Wilson, Literature**

20th-century and contemporary African American literature; poetry; contemporary American poetry and poetics; Black visual culture; recent experimental writers and artists

**Pat Zavella, Latin American and Latina/o Studies**

Transnational migration by Mexicans, poverty, family, sexuality, labor, social networks, feminist studies, Chicana/o-Latina/o studies, ethnographic research methods

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## CRITICAL RACE AND ETHNIC STUDIES COURSES

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### LOWER-DIVISION COURSES

**10. Critical Race and Ethnic Studies: An Introduction. F**

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(s): Satisfaction of the Entry Level Writing and C1 requirements. (General Education Code(s): ER.) N. Mitchell

**70S. Introduction to the Sikhs (2 credits). W**

Introduces the Sikh community, including origins, history, belief system, and contemporary issues. Other topics include: Sikh music, art, literature, and aspects of Sikh society. Attention paid to the Sikh diaspora in the United States and in California in particular, including comparative perspectives with other minority communities. (Formerly Humanities 70S.) N. Singh

### UPPER-DIVISION COURSES

**100. Comparative Theories of Race and Ethnicity. W**

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(s): course 10 and satisfaction of the Entry Level and C1 requirements. (General Education Code(s): ER.) V. Cooppan

## Critical Race and Ethnic Studies

### **101. Research Methods and Writing in Critical Race and Ethnic Studies. S**

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(s): course 10 and

satisfaction of the Entry Level Writing and Composition requirements. R. Langhout

### **190. Senior Seminar. S**

Required research seminar for Critical Race and Ethnic Studies majors in which students write a substantial research paper or a series of short papers. May be organized around a specific theme

at the instructor's discretion. Prerequisite(s): courses 10 and 100, and satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to junior and senior CRES majors. Enrollment limited to 25. E. Porter

Revised 09/01/2015

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# CROWN COLLEGE

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2015-16 General Catalog

College Office  
(831) 459-2665

<http://crown.ucsc.edu/>

For college description and list of faculty, see [Colleges](#).

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## CROWN COLLEGE COURSES

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### LOWER-DIVISION COURSES

#### **28. Crown Student Leadership Development Seminar (2 credits). W**

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. The Staff

#### **31. Crown College Student Leadership in Action Seminar (2 credits). S**

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. The Staff

#### **60. The Environment on Film: Rhetoric of Ecocriticism. \***

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. Enrollment restricted to college members during priority enrollment. Enrollment limited to 24. (General Education Code(s): IM, IH.) The Staff

#### **70. Introduction to Broadcast Media: Radio. F,W,S**

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. Enrollment by permission of instructor. Enrollment limited to 14. (General Education Code(s): PR-S.) K. Rozendal

#### **79. Engaging the University: Core Exploration (2 credits). F**

First, introduces Crown students to university-level discourse through a series of four selected plenary sessions, each followed by collaborative discussion and writing in small groups. Second, prepares students for the winter offering of Core through practice of textual analysis and by early introduction of the themes of Core. Third, encourages exploration of the campus so students can make full use of the recreational and support resources available. (Formerly Introduction to Ethical Foundations.) Prerequisite(s): Satisfaction of the the Entry Level Writing Requirement. Enrollment is restricted to first-year Crown College members. The Staff

#### **80A. University Discourse: Ethical and Political Issues in Emerging Technologies. F,W**

Explores rhetorical principles and conventions of university discourse, providing intensive practice in analytical writing, critical reading, and speaking. Examines ethical challenges brought about by rapidly changing science and technology. Students cannot receive credit for this course and course 80B. Enrollment restricted to first-year college members who have not satisfied the C1 requirement. (General Education Code(s): T6-Natural Sciences or Humanities and Arts, C1.) The Staff

#### **80B. Rhetoric/Inquiry: Ethical and Political Issues in Emerging Technologies. F,W**

Explores intersection, interpretation, and persuasion and hones strategies for writing and research. Examines ethical challenges brought about by rapidly changing science and technology. Students cannot receive credit for this course and course 80A. Prerequisite(s): satisfaction of the Entry Level Writing and C1 requirements. Enrollment restricted to first-year Crown College members. (General Education Code(s): T6-Natural Sciences or Humanities and Arts, C2.) The Staff

#### **80F. Science Fictions. \***

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. (Formerly "Seminar in Science Fiction.") Prerequisite(s): satisfaction of the Entry Level Writing and C1 requirements. Enrollment limited to 22. (General Education Code(s): TA, T7-Natural Sciences or Social Sciences.) The Staff

**80J. Cyborg Society: Myths, Realities, Choices. \***

Examines content and methodologies of the emerging field of cyborgology. Includes social studies of science, anthropology, sociology, philosophy, politics, art, biology, and informatics. Enrollment limited to 25. (General Education Code(s): PE-T, T5-Humanities and Arts or Social Sciences.) C. Gray

**80L. Food Safety and Environmental Quality: The Complexities of a Safe Salad. \***

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. Enrollment limited to 24. (General Education Code(s): PE-E, T7-Natural Sciences or Social Sciences.) The Staff

**80S. Undergraduate Seminar in Science, Technology, and Society. \***

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. Preference given to Crown College students. Enrollment restricted to

first-year and sophomore students. Enrollment limited to 20. (General Education Code(s): T2-Natural Sciences.) The Staff

**84H. Extreme Environment Virology. W**

Students sample viruses from an extreme environment during a field trip, and sequence DNA from that sample and other viruses and assemble their genomes. This is an integrated course in molecular genetics and bioinformatics focusing on extreme environments. Enrollment restricted to Crown and Cowell Honors students. Enrollment limited to 24. (General Education Code(s): SI.) D. Bernick

**85. Visual Perception: A Window to Brain and Behavior.**

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. Enrollment is restricted to students in the Crown College or Cowell College first-year honors program. Enrollment limited to 25. E. Switkes

**93. Field Study. F,W,S**

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. May be repeated for credit. The Staff

**93F. Field Study (2 credits). F,W,S**

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. May be repeated for credit. The Staff

**99F. Tutorial (2 credits). F,W,S**

Various topics to be arranged between student and instructor. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**UPPER-DIVISION COURSES**

**123. Examining Our Life Through Writing. S**

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. (Formerly Science and Human Values) F. Andrews

**185. Career and Internship Preparation (1 credit). F,W,S**

For juniors and seniors preparing for an internship experience or career position. Subjects include: self-assessment of career objectives and/or internship goals; exploration of resources and techniques for finding and evaluating potential positions; resume writing; interview techniques; techniques to maximize learning in an internship and advancement in a job; communication; conflict resolution and problem solving in the organizational setting. Students are

Crown College

billed a materials fee. Enrollment limited to 40. The Staff

**191. Student Practicum. F,W,S**

The student learns teaching skills by working with a faculty member in a Crown College course. Activities include facilitating discussions, helping students improve skills, and modeling leadership. The student must have demonstrated excellent performance in the course in which he/she will be assisting to be considered. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment by interview only. Enrollment limited to 1. The Staff

**198. Independent Field Study. F,W,S**

Provides for college-sponsored individual study programs off campus. Approval of student's faculty sponsor and college academic provost required. The Staff

**199. Tutorial. F,W,S**

Various topics to be arranged between student and instructor. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S**

Various topics to be arranged between student and instructor. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# DIGITAL ARTS AND NEW MEDIA

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2015-16 General Catalog

DARC 204

(831) 459-1919

<http://danm.ucsc.edu>

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## PROGRAM DESCRIPTION

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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.

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### PROGRAM LEARNING OBJECTIVES

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1. Develop necessary digital art and new media knowledge to understand the state of the field. Examples: Technical, aesthetic, historical, and theoretical knowledge.
2. Demonstrate ability to define, plan, and execute individual and collaborative digital art and new media research projects. Examples: Developing project concepts, prototyping, timeline development, creative problem solving.
3. Understand multiple forms of digital art and new media critique, be able to respond to and give critiques productively. Examples: Forms such as studio critique, performance critique, system design critique, and writing critique. Ability to understand critique, evaluate feedback, produce iteration of work.
4. Demonstrate ability to participate in planning, coordinating, and executing collaborative digital art and new media research projects. Examples: Brainstorming, collaborative idea formalization and project planning, iterative development and refinement, team coordination and communication.
5. Employ professional communication practices in digital art and new media to make public contributions to the field. Examples: Research papers, artist talks and statements, exhibitions, performances.

The Digital Arts and New Media M.F.A. Program is a two-year program organized into four interdependent and equally important pursuits:

**New Praxis**—The term “praxis” has many meanings, which include “translating ideas into action” and “action and reflection upon the world in order to change it.” New Praxis in DANM is comprised of “critique” and “practicum” which provide students with both the practical training and critical dialogue necessary to pursue their own individual goals as artists and cultural practitioners.

**Studies**—DANM “studies” include required core seminars that allow students first to explore an array of recent methods and approaches in digital arts and culture, and then 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 developing their thesis project and paper.

**Collaborative Research**—Students and faculty engage in research collaborations resulting in publications and exhibitions in one of four possible focused research areas: mechatronics, participatory culture, performative technologies, and playable media described below.

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### MECHATRONICS

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Mechatronics is the functional integration of mechanical, electronic, and information technologies. In DANM this framework may be employed for the development and production of physical, systems-based artwork that incorporates elements of robotics, motion control, software engineering, and hardware design. DANM mechatronics research involves the use of a variety of media including video, performance, and sculpture for the creation of complex, kinetic, audio-visual systems for the exploration of temporality, materiality, experience, and perception.

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### PARTICIPATORY CULTURE

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Participatory culture studies and research efforts explore the role of information and communication technologies in the current shift from “top-down”

## Digital Arts and New Media

culture to a culture of participation and social engagement. Within the social register, the human/computer interface acts as both a boundary and a bridge. Participatory culture research in DANM encompasses a range of projects in social computing and community-media activism which involve the design of new technologies to address social problems and facilitate broader participation in culture and politics.

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### PERFORMATIVE TECHNOLOGIES

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Research in performative technologies explores new methods for combining media and technology to create the visual, aural, and connective material of performance. DANM performance research generates new public and performative spaces where digital media, communication networks, and interactive systems may be fused with lighting, movement, and stage and sound design to create real-time shared multimedia experiences for audiences and performers at both local and remote locations. Ongoing projects in this area may include work in telematics; performance-driven, real-time graphics; algorithmic composition of sound and image; computer vision and motion capture; and studies of ritual, performativity, embodiment, interactivity, and subjectivity.

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### PLAYABLE MEDIA

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Playable media research explores the potential of computational systems for the creation of new media forms that invite and structure play. This group works to understand and create new ways for computer games and related forms to engage audiences, make arguments, tell stories, and shape social space. Ongoing playable-media work combines game-design and artificial-intelligence research with writing, art, and media authoring.

Prospective students are asked to identify their choice of research group in their application and statement of purpose. Admissions are tied to DANM project group foci. New students are admitted into a specific project group based on the quality and relevance of the student's prior work and expertise to the group project in their chosen area of focus. Students collaborate on faculty-initiated and -directed research projects. This work is intended to provide the student with the opportunity to learn collaborative and practical research methodologies, and to participate in a professional-level research project. The collaborative-project group experience is intended to inform, but not necessarily contribute to, the student's thesis project.

**Pedagogy**—DANM trains future arts academics through practical experience. Students are awarded teaching

assistantships as part of their overall support package as well as opportunities to assist faculty in workshops.

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## REQUIREMENTS

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The DANM M.F.A. Program requires 72 credits of academic course work. In the first year, students generally take three courses each term—one course in each of the program areas, New Praxis, Studies, and Collaborative Research. 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.

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### NEW PRAXIS

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New Praxis in DANM is comprised of “critique” and “practicum.” Students are required to take seven new praxis courses over two years and have the option to take two new praxis electives.

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#### New Praxis–Year One

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**Practicum**—This area of praxis is designed to allow students to develop the conceptual, technical, and practical skills they need to successfully complete projects that realize their own individual goals as digital media artists.

**DANM 210**—First-year students are required to take a Project Design Studio in the first quarter. This course guides the development of students' individual studio practice, particularly in relation to the transition to digital media.

**Electronic and programming requirements**—First-year students also take basic courses in electronics and programming. Students with prior experience in programming and/or electronics should discuss their background with the instructor and their adviser to determine if the course is needed or if an alternative course should be taken to fulfill this credit requirement. Students seeking an alternative means to fulfill this requirement may choose to:

- serve as assistants in workshops for beginning students;
- take electronics or programming electives offered in computer engineering; or
- enroll in independent studies, as approved by their adviser.

**Critique**—This area of praxis is designed to allow students to present their own work and review the work of their fellow students as a means of engaging in the critical dialogue necessary to pursue their own individual goals as digital media artists. First-year students are required to present work-in-progress based on the projects developed in the project-design

## Digital Arts and New Media

course in both individual studio and group critiques, and participate in group critique discussion.

During the spring quarter, first-year students identify and engage a thesis committee under the supervision of the program director.

### New Praxis–Year Two

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**Practicum**—During the fall quarter, second-year students work on the development of their thesis project proposal and abstract under the supervision of their thesis committee. Second-year students are encouraged to take practice-based electives and independent studies that facilitate the development of their thesis projects.

**DANM 299**—In the winter and spring quarters, second-year students enroll in a minimum of 10 credits of independent thesis research which is supervised by one or more members of their thesis committee.

**DANM 215**—Students work with faculty curator/coordinator on development of thesis projects specifically for the group exhibition context. Students contribute to development of exhibition design and collateral materials, while studying the unique presentation and curatorial challenges of new media.

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## STUDIES

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Students are required to take three core seminars over two years and have the option to take two studies electives.

### STUDIES–YEAR ONE

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**DANM 201 Recent Methods and Approaches to Digital Arts and Culture**—In this seminar students examine an array of methods and approaches to research and writing in digital media art and culture and explore key theories concerning digital media and cultures.

**DANM 202 Dialogues and Questions in Digital Arts and Culture**—A pre-thesis course in which students engage in dialogues at the intersection of theory and practice with the goal of producing a pre-thesis proposal and preparatory essay. Readings and seminar discussions will inform the development of pre-thesis project proposals and essays.

### STUDIES–YEAR TWO

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**DANM 203 Professional Development in the Arts**—Designed as a professional art practices practicum, this course is focused on researching opportunities and developing practical strategies and skills to ensure success outside of an academic environment.

**Elective**—Students may choose to take an elective offered by the program or choose an elective from a

broad array of graduate courses offered on campus with the approval of their adviser.

### COLLABORATIVE RESEARCH

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Students participate in a three-quarter-long, collaborative-research project group in one of four possible DANM research focus areas, which takes place in the winter and spring quarters of the first year. In the second year, students continue with the final quarter of their project group (fall). This work is intended to provide the student with the opportunity to learn collaborative and practical research methodologies, and to participate in a professional-level research project.

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## THESIS REQUIREMENT

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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 are expected to grow out of the research pursued in the project groups during the three quarters prior as well as work developed in new praxis courses. Each student will be expected to complete a 20- to 30-page 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. The chair of the three-person committee will be a full associate professor and DANM faculty member. A completed thesis project and paper must be submitted to and approved by the thesis committee before the degree can be awarded.

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## APPLICATIONS

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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.

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

## Digital Arts and New Media

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 web site 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: <http://graddiv.ucsc.edu>.

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## DIGITAL ARTS AND NEW MEDIA PRINCIPAL FACULTY AND PROFESSIONAL INTERESTS

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### **Elliot W. Anderson, Associate Professor, Art**

Electronic art, digital arts/new media

### **Michael Chemers, Associate Professor, Theater Arts**

Theater history and theory, playwriting, dramaturgy, acting

### **Sharon A. Daniel, Professor, Film and Digital Media**

New media documentary and database documentary; social, economic, environmental and criminal justice; Participatory culture, Community-based public art in information and communications environments; social and political aspects of information design; net art, social-practice art

### **David Dunn, Assistant Professor, Music**

Sound art and design, music and the environment, acoustic ecology, compositional linguistics, live electro-acoustic performance, composition, bio-acoustic research, history of electronic music practice, art and science, audio engineering and location recording

### **Jennifer A. González, Professor, History of Art and Visual Culture**

Contemporary theories of visual culture, semiotics, critical museum studies, photography, public and activist art in the U.S.

### **Soraya Murray, Assistant Professor, Film and Digital Media**

Contemporary visual culture and representation including: new media art; projected arts; photography; electronic games; theories of art and globalization; representations of migration and otherness

### **Jennifer Parker, Associate Professor, Art**

Sculpture, digital art and new media, art | science

### **Warren Sack, Professor, Film and Digital Media**

Software design and media theory

### **Noah Wardrip-Fruin, Professor, Computational Media**

Digital media, computer games, electronic literature, software studies

### **Affiliate Faculty and Professional Interests**

**Ralph H. Abraham, Professor Emeritus, Mathematics**

### **Lawrence Andrews, Associate Professor, Film and Digital Media**

Film and video production, documentary, installation and media art, sound, animation

### **Neda Atanasoski, Associate Professor, Feminist Studies**

New media and film; critical race and ethnic studies; feminist theory; human rights and humanitarianism; war and nationalism; religion and secularism; post-socialist politics and culture in Central and Eastern Europe

### **Brandin Baron-Nusbaum, Associate Professor, Theater Arts**

Costume design, history of design

### **Amy C. Beal, Professor, Music**

American music, 20th-century music, experimental and improvisatory performance practices, postwar and Cold War culture, German new music festivals and radio stations, piano performance, contemporary music ensemble

### **James H. Bierman, Professor, Theater Arts (Drama)**

Playwriting, theater history and literature, classical and Renaissance drama, Chicano theater, digital media

### **Benjamin L. Carson, Associate Professor, Music**

Theories of consciousness and cognition, rhythm perception, Schoenberg, history of compositional method, subjectivity and identity

### **E.G. Crichton, Professor Emerita, Art**

### **Christopher Connery, Professor, Literature**

World literature and cultural studies, globalism and geographical thought, the 1960s, Marxism, pre-modern and modern Chinese cultural studies, cultural revolution

### **James E. Davis, Professor, Computer Science**

Information and Communication Technologies for Development (ICTD), technology for global social issues, human computation, computational photography, computer vision, computer graphics

### **Kate Edmunds, Professor, Theater Arts**

Set design for theater and film

## Digital Arts and New Media

### **Shelly E. Errington, Professor, Anthropology**

Globalization of folk art, visual and social semiotics, photography, film, the Internet and digital media, Southeast Asia, and Latin America

### **Irene Gustafson, Associate Professor, Film and Digital Media**

Producing across the boundaries between "theory" and "practice," non-fiction media, experimental film/video, production design, gender and queer studies

### **Helen Mayer Harrison, Visiting Eminent Professor, Arts Division and Art Department**

### **Newton Harrison, Visiting Eminent Professor, Arts Division and Art Department**

### **Dee Hibbert-Jones, Associate Professor, Art**

Public art, sculpture

### **Robin Hunicke, Associate Professor, Art**

Game design

### **Kimberly Jannarone, Professor, Theater Arts (Drama)**

Directing, dramaturgy, dramatic theory and criticism, theater history, acting

### **Sri Kurniawan, Associate Professor, Computer Engineering**

Human-computer interaction; human factors and ergonomics; accessibility; assistive technology; usability; empirical studies; user-centered design

### **John Jota Leanos, Associate Professor, Social Documentation**

Documentary animation, social documentation, social art practice, community arts, Chicana/o art and culture, new media, critical media studies, cultural studies, documentary photography, installation art, public art and interventionist art practice

### **Irene Lusztig, Associate Professor, Film and Digital Media**

Film and video production, experimental ethnography

and essayistic nonfiction; representations of historical memory; archives, propaganda and training films; feminist film practices; medical film; autobiographical filmmaking; interactive documentary; editing

### **Michael J. Mateas, Professor, Computational Media**

Artificial Intelligence (AI) for art and entertainment, game AI, AI and creativity, AI-based interactive storytelling, autonomous characters

### **Margaret E. Morse, Professor Emerita, Film and Digital Media**

### **Larry Polansky, Professor, Music**

Composition, post-tonal theory, algorithmic music, American music, tuning theory, contemporary music, ensemble performance and performance practice, acoustic and electric guitar music, music editing and publishing, interdisciplinary collaboration, music and scientific research

### **B. Ruby Rich, Professor, Social Documentation and Film and Digital Media**

Documentary film and video, post-9/11 culture, new queer cinema, feminist film history, Latin American and Latin/a cinema, U.S. independent film and video, the essay film, the politics of film festival proliferation and the marketing of foreign films in the U.S.

### **Kate O'Riordan, Associate Professor, Art**

Theory, digital media technologies.

### **Elizabeth Stephens, Professor, Art**

Intermedia, electronic art, sculpture, and performance art

### **Gustavo Vazquez, Professor, Film and Digital Media**

Film and video production, documentary and experimental cross-cultural experiences in film

### **Emmet J. Whitehead, Professor, Computational Media**

Software engineering, software configuration management, web, hypertext, collaborative authoring, hypertext versioning, Internet information systems

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## DIGITAL ARTS AND NEW MEDIA COURSES

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### UPPER-DIVISION COURSES

#### **199. Tutorial. F,W,S**

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. May be repeated for credit. The Staff

#### **199F. Tutorial (2 credits). F,W,S**

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. May be repeated for credit. The Staff

### GRADUATE COURSES

#### **201. Recent Methods and Approaches to Digital Arts and Culture. F**

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

## Digital Arts and New Media

technologies and socio/cultural formations. Enrollment restricted to graduate students. S. Murray

### **202. Dialogues and Questions in Digital Arts and Culture. S**

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. (Formerly Digital Arts and New Media 203.) (Also offered as Music 254Q. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. W. Sack

### **203. Professional Development for the Arts. S**

A professional art practices practicum that focuses on researching opportunities and developing practical strategies and skills to ensure success outside an academic environment. (Formerly Frameworks and Arguments in Digital Arts and Culture.) Enrollment restricted to graduate students. The Staff

### **210. Project Design Studio. F**

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. Enrollment restricted to graduate students. J. Parker

### **211. Critique. S**

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. Enrollment restricted to graduate students. Enrollment limited to 18. J. Gonzalez

### **212. Thesis Proposal (no credit). S**

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. Enrollment restricted to DANM students. M. Chemers

### **215. MFA Exhibition Production. W**

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. Enrollment restricted to graduate students. The Staff

### **216. Digital Bodies. \***

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. Enrollment restricted to graduate students. Upper-division undergraduates may enroll with permission of instructor. Enrollment limited to 17. J. Gonzalez

### **217. Computer-Assisted Composition. W**

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. (Also offered as Music 206B. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. L. Polansky

### **219. Introduction to Electronics for Artmaking. F**

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. Enrollment restricted to graduate students. The Staff

### **220. Introduction to Programming for the Arts. W**

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. Enrollment restricted to graduate students. W. Sack

### **221. Mathematics and the Arts. \***

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

## Digital Arts and New Media

history of leading innovators and techniques from 1950 to the present. Student projects explore the creative process today using cutting-edge technologies. Enrollment restricted to graduate students. Upper-division undergraduates may enroll with permission of instructor. Enrollment limited to 30. May be repeated for credit. R. Abraham

### **227. Projected Light in Performance. \***

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. Enrollment restricted to graduate students. Juniors and seniors may enroll with permission of instructor. Enrollment limited to 20. D. Cuthbert

### **231. Human-Computer Interaction. \***

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 course 131. (Also offered as Computer Engineering 231. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. S. Kurniawan

**233. The Object as Interface. \***  
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. Enrollment restricted to graduate students. Enrollment limited to 15. W. Hibbert-Jones

### **241B. Modern Art: Cubism to Pop. W**

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 History of Arts and Visual Culture 141B. Enrollment restricted to graduate students in digital arts new media, film, music, social documentation, theater, or visual studies. J. Gonzalez

### **250A. Collaborative Research Project Group: Mechatronics. F,W,S**

Three-quarter collaborative research project group involves faculty-initiated research in the use of a variety of media including video, performance, and sculpture, for the creation of complex, kinetic, audio-visual systems exploring temporality, materiality, experience, and perception. Enrollment restricted to graduate students. Enrollment limited to 8. May be repeated for credit. D. Dunn, J. Parker

### **250B. Collaborative Research Project Group: Participatory Culture. F,W,S**

Three-quarter collaborative research project group encompasses a range of faculty-initiated projects in social computing and community-media activism, which involve the design of new technologies to address

social problems and facilitate broader participation in culture and politics. Enrollment restricted to graduate students. Enrollment limited to 8. May be repeated for credit. S. Daniel

### **250C. Collaborative Research Project Group: Performative Technologies. W,S**

Three-quarter collaborative research project group generates faculty-initiated new public and performative spaces where digital media, communication networks, and interactive systems may be fused with lighting, movement, stage, and sound design to create shared multimedia experiences for audiences and performers. Enrollment restricted to graduate students. Enrollment limited to 8. May be repeated for credit. B. Baron, K. Jannarone

### **250D. Playable Media. W,S**

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. (Formerly Computer Science 290J.) (Also offered as Computational Media 290J. Students cannot receive credit for both courses.) May be repeated for credit. N. Wardrip-Fruin

### **254I. Empirical Approaches to Art Information. \***

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

## Digital Arts and New Media

(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. (Also offered as Music 254I. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. Enrollment limited to 17. May be repeated for credit. B. Carson

### **254L. John Cage: Innovation, Collaboration, and Performance Technologies. \***

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. (Also offered as Music 254L. Students cannot receive credit for both courses.) Enrollment restricted to juniors, seniors, and graduate students. Upper-division undergraduates may enroll with permission of instructor. Enrollment limited to 12. The Staff

### **267. Workshop in Computer Music and Visualization (2 credits). F,W,S**

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 by permission of instructor; appropriate graduate experience required. Enrollment restricted to graduate students. (Also offered as Music 267. Students cannot receive credit for both courses.) Enrollment limited to 12. May be repeated for credit. The Staff

### **290P. Topics in Computational Cinematography. \***

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. (Formerly Computer Science 290P.) (Also offered as Computational Media 290P. Students cannot receive credit for both courses.) The Staff

### **297. Independent Study. F,W,S**

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 restricted to graduate students. Maximum 10 credits. May be repeated for credit. The Staff

### **297G. Independent Study (3 credits). F,W,S**

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 restricted to graduate students. May be repeated for a maximum 6 credits. May be repeated for credit. The Staff

### **299. Thesis Research. F,W,S**

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 restricted to graduate students. Maximum 10 credits. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# EARTH AND PLANETARY SCIENCES

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2015-16 Catalog

A232 Earth and Marine Sciences Building

(831) 459-4089

<http://eps.ucsc.edu>

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## PROGRAM DESCRIPTION

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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?

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 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. 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, ocean sciences, planetary sciences, and science education. 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 web site:

<http://eps.ucsc.edu/>.

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## ACADEMIC ADVISING

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A student who wants to become an Earth sciences major should contact the [Earth and Planetary Sciences Department undergraduate staff adviser](#) as soon as possible. After developing a formal study plan and

## Earth and Planetary Sciences

submitting a declaration of major petition, students are required to meet with staff and faculty advisers who can help the student plan his or her program in detail and provide information about independent study, thesis research, advanced study, career options, and other educational opportunities. Relevant courses taken at UCSC or other institutions may be substituted for degree requirements by approved petition. Please see the undergraduate adviser for the substitution petition form and more information about this process.

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### BACHELOR OF SCIENCE DEGREE

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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 UCSC. 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: environmental geology, ocean sciences, science education, and planetary sciences. A senior comprehensive experience (senior thesis, or geologic field camp, intensive internship experience, or exemplary performance in a graduate course) is required of all majors.

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### QUALIFYING FOR THE MAJOR

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We recommend that you consult with the department's undergraduate staff adviser to discuss options for degree concentrations and coursework priorities before you start the process of officially declaring your major. To declare the Earth sciences majors (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:

Earth Sciences 5, California Geology

Earth Sciences 10, Geologic Principles

Earth Sciences 20, Environmental Geology

Transfer students may take an approved substitution for one of the above courses.

Students who qualify start the declaration process by submitting a petition to the department staff adviser: <http://undergrad.pbsci.ucsc.edu/earth/qualifying/petition-to-declare.html>.

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### TRANSFER STUDENTS

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Transfer students planning to major in Earth sciences are strongly recommended (but not required) to complete all lower-division mathematics and science pre-requisites appropriate to their concentration of interest. For example, students planning to major in Earth sciences with a Planetary Science Concentration should complete the equivalents to the following courses (including the associated laboratory components): Mathematics 11A and 11B; Chemistry 1A/L, 1B/M and 1C/N; Physics 6A/L and 6B/M; and Earth Sciences 5/L, 10/L or 20/L. One of the latter Earth sciences courses is required for declaring the major (see above).

Having this coursework completed elsewhere allows students greater flexibility in scheduling and completing their UCSC Earth and planetary sciences courses. Transfer students planning on attending UCSC to pursue an Earth sciences major should review the transfer preparation information at: <http://undergrad.pbsci.ucsc.edu/earth/transfer-students/index.html>.

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### LETTER GRADE POLICY

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For all students entering UCSC in fall 2015 and later, all but two (2) courses used to satisfy requirements for any of the Earth and planetary science majors must be taken for a letter grade. Combined majors (Earth sciences/anthropology and Earth sciences/environmental studies) are currently exempt from this policy.

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### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) general education requirement. All majors described below, with exception of the science education concentration, require students to complete a minimum

## Earth and Planetary Sciences

of two (2) courses from the list of courses that in combination satisfies the Disciplinary Communication general education requirement. Consult one of the Earth and planetary sciences advisers for the most up-to-date list of scheduled classes. Currently the list (subject to change) consists of:

Earth Sciences 100, Vertebrate Paleontology

Earth Sciences 101, Invertebrate Paleobiology

Earth Sciences 102, Marine Geology

Earth Sciences 104, Geologic Hazards

Earth Sciences 109, Field Geology

Earth Sciences 120, Sedimentology and Stratigraphy

Earth Sciences 140, Geomorphology

Earth Sciences 146, Ground Water

Earth Sciences 148, Glaciology

Earth Sciences 150, Structural Geology

Earth Sciences 152, Tectonics

Earth Sciences 160, Planetary Science

Earth Sciences 188A, Summer Field Internship

Earth Sciences 191A, Climate Change Science and Policy

Earth Sciences 195, Senior Thesis

Students in the combined Earth Sciences/Anthropology major may, in addition choose their courses to satisfy the DC requirement from the following Anthropology offerings: 100, 170, 194B, 194L, and 194Y.

Students in the Science Education Concentration must complete the DC requirement by taking Education 185L in addition to either Earth Sciences 109 or both Earth Sciences 120 and 150.

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### COMPREHENSIVE REQUIREMENT (B.S.)

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All students must satisfy the senior comprehensive requirement. To do so, each student must complete one of the following options:

1) Satisfactory completion of Earth Sciences 188A, Summer Field Internship; and Earth Sciences 188B, GIS with Applications in the Earth Sciences.

2) Satisfactory completion of a senior thesis, which must include a significant element of independent research or original work and can only be undertaken after agreement is obtained from a faculty member to supervise it (at least three quarters in advance of completion). Students may take Earth Sciences 199, Independent Study, as part of performing the research for their senior thesis. It is required that each student enroll in and pass Earth Sciences 195, Senior Thesis, in the academic quarter during which they complete their thesis.

3) Exemplary performance (grade of B or better), including a major written report, in a 5-credit graduate course or seminar (which requires permission from the instructor in order to enroll).

4) Satisfactory completion of course offerings are: Earth Sciences 191A, Climate Change and Policy (was Earth Sciences 191); Earth Sciences 191B, Planetary Science Capstone (was Earth Sciences 193); and Earth Sciences 112, Practical Geophysics. Other capstone courses in the 191 series may also be added in the future.

5) Satisfactory completion of a 5-credit internship (Earth Sciences 198) under the guidance of an on-site supervisor, with coordination and prior approval of the department's internship director. The project must include a comprehensive final written report.

Various external field/research experiences may also satisfy this requirement. See the faculty adviser for more details.

**Please note:** Courses that are used to satisfy the capstone may not also count toward fulfilling the upper-division elective requirement.

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### REQUIREMENTS FOR THE STANDARD EARTH SCIENCES MAJOR (B.S.)

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#### REQUIRED LOWER-DIVISION COURSES

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Chemistry 1A, 1B/M and 1C/N

Mathematics 11A-B or 19A-B, or Applied Mathematics and Statistics 15A-B; and Mathematics 22 or 23A, or Earth Sciences 111

Physics 6A/L and 6B/M (preferred), or 5A/L and 5B/M  
Earth Sciences 5/L, or 10/L, or 20/L

#### REQUIRED UPPER-DIVISION COURSES

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Earth Sciences 110A/L, 110B/M, and 110C/N, 190 (optional but recommended 1-credit mentorship class)

At least six elective courses (5+ credits each) from upper-division Earth sciences or ocean sciences offerings must be completed. Earth Sciences 198 and 199 may not be used to satisfy this requirement.

Two or more of the upper-division electives must be selected from courses with an intensive field/laboratory/data analysis component. The following courses that satisfy this requirement:

Earth Sciences 107, 109, 112, 116, 117, 119, 120, 125, 130, 140, 142, 146, 148, 150, 188A, 188B.

**Note:** Courses used to satisfy the senior comprehensive requirement **cannot** also be used to satisfy the field/laboratory/analysis requirement.

## Earth and Planetary Sciences

Two or more courses must also be completed in from the list of courses that satisfy the Disciplinary Communications (DC) requirement, as described above.

Students also complete the senior comprehensive requirement as described above.

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. The following are examples of suggested elective distributions that develop expertise in important areas (an asterisk (\*) indicates that the course satisfies the laboratory or field data acquisition/analysis requirement).

**Earth system sciences.** Focuses on terrestrial, marine, and atmospheric processes and their relations through time; may include paleoclimatic and paleoenvironmental dynamics, global change issues, and surface geological processes such as weathering, erosion, and hydrology: 100/L, 101/L, 102, 107, 109/L\*, 116\*, 119\*, 120/L\*, 121, 125, 128, 148\*, 191, 208, Ocean Sciences 102, 120

**Earthquake and faulting studies.** Focuses on crustal deformation and faulting processes and related phenomena such as plate motions, earthquakes, and stress in the lithosphere: 109/L\*, 117/L\*, 119\*, 150/L\*, 162, 168\*, 172

**Geologic hazards.** Focuses on Earth processes that impact society, including earthquakes, volcanoes, coastal erosion, and landslides: 104, 105, 107, 109/L\*, 116\*, 140/L\*, 142\*, 146\*

**Geology.** Emphasizes a traditional broad background with field skills, rock genesis and interpretation, and structural relations: 109/L\*, 117/L\*, 120/L\*, 130/L\*, 140/L\*, 150/L\*

**Geophysics.** Develops breadth in geophysical techniques, composition and structure of Earth's deep interior, and gravitational and magnetic fields: 117/L\*, 119\*, 150/L\*, 160, 162, 168\*, 172

**Marine geophysics.** Emphasizes a breadth of geological and geophysical background for continuing study of the processes involved in the growth, evolution, and destruction of the ocean floor and margins: 107, 117/L\*, 146\*, 150/L\*, 152, 168\*

**Surface processes.** Emphasizes understanding the fluxes of energy, water, mass, and chemicals within and across Earth's surface and the relations to climatic and tectonic forcing processes: 107, 109/L\*, 116\*, 119\*, 120/L\*, 140/L\*, 128, 142\*, 146\*, 148\*, 163, Microbiology and Environmental Toxicology 144

**Water resources.** Focuses on water resources quality and quantity and relations between climate and water

in and on the crust: 105, 109/L\*, 116\*, 119\*, 121, 140/L\*, 142\*, 146\*, 148\*, Microbiology and Environmental Toxicology 144, Ocean Sciences 120

## STANDARD EARTH SCIENCES B.S. MAJOR PLANNER

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 adviser and from faculty members.

**Note:** Chemistry 1A, 1B/M and 1C/N and Mathematics 11A-B and 19A-B and 22 and 23A are offered every quarter. Physics 6A/L is offered every quarter but Physics 6B/M is not offered in fall.

Year	Fall	Winter	Spring
1st (frsh)	CHEM 1A	MATH 11A or 19A or AMS 15A	EART 10/L MATH 11B or 19B or AMS 15B
	College core	CHEM 1B/M	CHEM 1C/N
2nd (soph)	EART 110A/L*	EART 110B/M*	EART 109/L*
	MATH 23A or EART 111	PHYS 6A/L	PHYS 6B/M
3rd (jr)		EART elective	EART 110C/N
	EART elective		EART elective
4th (sr)	EART elective	EART elective	EART 188A-B or senior thesis (EART 195)†
	senior thesis (EART 199) †	senior thesis (EART 199) †	
	EART 190 (1-credit, optional)		

\*EART 109/L, 110A/L, and 110B/M are required for participation in EART 188A-B

†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

## Earth and Planetary Sciences

theses usually require at least two or three quarters for completion.

### EARTH SCIENCES MAJOR WITH CONCENTRATION IN ENVIRONMENTAL GEOLOGY (B.S.)

The environmental geology concentration is designed to provide quantitative preparation for career pathways involving interdisciplinary study of the environment with a geological emphasis. Additional biology and environmental studies courses are required for this concentration along with other distributions of upper-division requirements and electives.

#### REQUIRED LOWER-DIVISION COURSES

Earth Sciences 20/L (recommended) or 10/L or 5/L  
Environmental Studies 25

Biology: Ecology and Evolutionary Biology (EEB) BIOE 20C

Chemistry 1A, 1B/M, and 1C/N

Mathematics 11A-B or 19A-B, or Applied Mathematics and Statistics 15A-B

Physics 6A/L and 6B/M (preferred), or 5A/L and 5B/M

#### REQUIRED UPPER-DIVISION COURSES

Earth Sciences 110A/L and 110B/M, 190 (optional, 1-credit mentorship class)

At least four elective courses (5+ credits each) from upper-division Earth sciences or ocean sciences courses must be completed. Earth Sciences 198 and 199 may not be used to satisfy this requirement.

At least two courses must be completed from the list of courses that satisfy the DC requirement. See above for the full list.

Two additional upper-division electives, preferably with environmental topics from biology, chemistry, Earth and planetary sciences, environmental studies, environmental toxicology, or ocean sciences. Courses may simultaneously satisfy both the upper-division elective and DC requirements. Earth Sciences 198 and 199 may not be used to satisfy this requirement.

Students also complete a senior comprehensive requirement from the list described above.

### EARTH SCIENCES (ENVIRONMENTAL GEOLOGY) B.S. MAJOR PLANNER

Year	Fall	Winter	Spring
1st (frsh)	CHEM 1A	EART 20/L	
	College core	MATH 11A or 19A or AMS 15A	MATH 11B
		CHEM 1B/M	CHEM 1C/N
2nd (soph)	EART 110A/L*	EART 110B/M*	EART 109/L*
	PHYS 6A/L	PHYS 6B/M	
3rd (jr)	BIOE 20C	EART elective	
	EART elective	ENVS 25	EART elective
4th (sr)	EART elective	EART elective	EART elective
	senior thesis (EART 199)†	senior thesis (EART 199)†	senior thesis (EART 195)† or EART 188A-B
	EART 190 (1-credit, optional)		

\* EART 109/L, 110A/L, and 110B/M are required for participation in EART 188A-B.

† 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 two or three quarters for completion.

### EARTH SCIENCES MAJOR WITH CONCENTRATION IN OCEAN SCIENCES (B.S.)

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.

#### REQUIRED LOWER-DIVISION COURSES

Earth Sciences 5/L or 10/L, or 20/L

BIOE 20C

Chemistry 1A, 1B/M and 1C/N

## Earth and Planetary Sciences

Mathematics 11A-B or 19A-B, or Applied Mathematics and Statistics 15A-B

Mathematics 22 or 23A or Earth Sciences 111

Physics 6A/L and 6B/M (preferred), or 5A/L and 5B/M

### REQUIRED UPPER-DIVISION COURSES

Earth Sciences 110A/L, 110B/M, 110C/N, 190 (optional, 1-credit mentorship class); Ocean Sciences 101 or 102

At least four elective courses (5+ credits each) chosen from upper-division Earth Sciences or Ocean Sciences courses must be completed. Earth Sciences 198 and 199 may not be used to satisfy this requirement. Choosing from the following list is recommended, but not mandatory: Earth Sciences 101/L, 102, 105, 107, 109/L, 111, 116, 119, 120/L, 121, 128, 130/L, 148, 172; Ocean Sciences 101, 102, 118, 120, 130, 200, 220, 260.

At least two courses must be completed from the list of courses that satisfy the DC requirement. See above for the full list

Students also complete a comprehensive requirement from the list described above. For those choosing a thesis, a topic emphasizing ocean sciences is recommended.

### EARTH SCIENCES (OCEAN SCIENCES) B.S. MAJOR PLANNER

Year	Fall	Winter	Spring
1st (frsh)	CHEM 1A	CHEM 1B/M	EART 10/L
	College core	MATH 11A or 19A or AMS 15A	CHEM 1C/N
			MATH 11B or 19B or AMS 15B
2nd (soph)	EART 110A/L*	EART 110B/M*	EART 110C/N*
	MATH 23A or EART 111	PHYS 6A/L	PHYS 6B/M
3rd (jr)	EART elective	OCEA 101	EART 109/L*
	BIOE 20C	CHEM 108B/M	
4th (sr)		EART elective	EART elective
	senior thesis (EART 199)†	senior thesis (EART 199)†	senior thesis (EART 195)† or EART 188A-B
	EART 190 (1-credit, optional)		

\* EART 109/L, 110A/L, and 110B/M are required for participation in EART 188A-B.

† 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 two or three quarters for completion.

### EARTH SCIENCES MAJOR WITH CONCENTRATION IN PLANETARY SCIENCES (B.S.)

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.

### REQUIRED LOWER-DIVISION COURSES

Earth Sciences 10/L (preferred); or 5/L; or 20/L

Astronomy 12 or 16 or 18

Chemistry 1A, 1B/M, and 1C/N

Mathematics 19A-B (preferred) or 11A-B, or AMS 15A-B

Mathematics 22; or 23A; or Earth Sciences 111

Physics 5A/L, 5B/M (preferred); or 6A/L, 6B/M

### REQUIRED UPPER-DIVISION COURSES

Earth Sciences 110A/L, 110B/M, 110C/N, 119, 160, 190 (optional, 1-credit mentorship class)

One elective from the following Earth Sciences courses: 162, 163, 164

At least three electives (5+ credits each) from upper-division Earth Sciences, Ocean Sciences, Astronomy 112 or 118, or Mathematics 130 must be completed. Earth Sciences 198 and 199 may not be used to satisfy this requirement. Choosing from the following list is recommended but not mandatory: Earth Sciences 107, 109/L, 116, 117/L, 121, 128, 130/L, 140/L, 148, 150/L, 152, 162, 163, 164, 172, 209, 210; Astronomy 112, 118; Mathematics 130.

At least two courses must be completed from the list of courses that satisfy the DC requirement. See above for the full list

Students also complete the comprehensive requirement from the list described above. For those choosing a thesis, a topic emphasizing planetary sciences is recommended.

## Earth and Planetary Sciences

### EARTH SCIENCES (PLANETARY SCIENCES) B.S. MAJOR PLANNER

Year	Fall	Winter	Spring
1st (frsh)	MATH 19A	MATH 19B	EART 10/L
	College core CHEM 1A	CHEM 1B/M	CHEM 1C/N Lower-div ASTR
2nd (soph)	EART 110A/L*	EART 110B/M*	EART 110C/N*
	PHYS 5A/L MATH 23A or EART 111	PHYS 5B/M	EART elective
3rd (jr)	EART 160	EART 119	EART 109/L*
	PHYS 5D (2 credits, optional)		
4th (sr)	senior thesis (EART 199)†	senior thesis (EART 199)†	senior thesis (EART 195)† or EART 188A-B
	EART 190 (1- credit, optional)	EART elective	EART elective

\* EART 109/L, 110A/L, and 110B/M are required for participation in EART 188A-B.

† 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 two or three quarters for completion.

### EARTH SCIENCES MAJOR WITH CONCENTRATION IN SCIENCE EDUCATION (B.S.)

The science education concentration provides future K-12 science teachers with coursework aligned with the California K-12 Earth and planetary science standards; a broad background across the sciences; and a thorough introduction to educational theory and practice including a sequence of three classroom-based internships. Additional biology, astronomy, and ocean science courses required for this concentration ensure that students are very well prepared to enter a rigorous teaching-credential program and, ultimately, a career in education. The senior comprehensive requirement involves a curriculum-development project jointly overseen by faculty in Earth and planetary sciences and UCSC's California Teach (Cal Teach) program.

Students may start with either the Cal Teach or Earth and Planetary Sciences Department for degree and course information, but must stay in contact with both for dual advising and development of study plans as well as approval for formally declaring the major.

#### REQUIRED LOWER-DIVISION COURSES

Earth Sciences 5/L (strongly recommended) or 10/L or 20/L

Astronomy 2 (recommended) or another lower-division course in astronomy

Molecular, Cell, and Developmental Biology (BIOL) 20A  
Ecology and Evolutionary Biology (BIOE) 20B and 20C  
Education 50C

Mathematics 11A-B, or 19A-B, or Applied Mathematics and Statistics 15A-B

Chemistry 1A, 1B/M, and 1C/N

Physics 6A/L and 6B/M

#### REQUIRED UPPER-DIVISION COURSES

Ocean Sciences 102

Earth Sciences 110A/L and 110B/M

Earth Sciences 109/L, or both 120/L and 150/L

Earth Sciences 111, or Mathematics 21 or 22, or Applied Mathematics and Statistics 5

At least two elective courses (5+ credits each) from upper-division Earth Sciences or Ocean Sciences offerings must be completed. Earth Sciences 198 and 199 may not be used to satisfy this requirement. One elective must involve significant laboratory or field data acquisition/analysis. The following courses currently satisfy this requirement:

Earth Sciences 107, 109, 112, 116, 117, 119, 120, 125, 130, 140, 142, 146, 148, 150, 188A, 188B.

Education 100C, 185C, 185L

One upper-division Education course from the following list: Education 128, 141, 164, or 181

Students complete a comprehensive requirement by doing an independent project through the Earth and Planetary Sciences Department, which applies knowledge of Earth and planetary sciences to K-12 curriculum development (Earth Sciences 194F).

## Earth and Planetary Sciences

### EARTH SCIENCES (SCIENCE EDUCATION) B.S. MAJOR PLANNER

Year	Fall	Winter	Spring
1st (frsh)	CHEM 1A	CHEM 1B/M	CHEM 1C/N
	EART 5/L	MATH 11A or 19B or AMS 15A	MATH 11B or 19B or AMS 15B
	College core	EDUC 50C	
2nd (soph)	EART 110A/L	EART 110B/M	ASTR 2
	EDUC 100C (2 credits)	PHYS 6A/L	PHYS 6B/M
3rd (jr)	EART 109/L	EDUC 185C	OCEA 102
	EART 111 or MATH 21	BIOL 20A	BIOE 20B
4th (sr)	EART/OCEA upper- division	EART/OCEA upper-division	EART 194F capstone
	BIOE 20C	EDUC 185/L (2 credits)	EDUC elective

### COMBINED MAJOR IN ENVIRONMENTAL STUDIES/EARTH SCIENCES (B.A.)

The combined major in environmental studies and Earth sciences is designed to provide enhanced exposure to geological concepts and processes for students emphasizing environmental policy and social science topics. Students are advised to plan carefully and to contact academic advisers in both the Environmental Studies and Earth and Planetary Sciences Departments early if they have questions. For the requirements of the combined environmental studies/Earth sciences bachelor of arts (B.A.) degree, see the environmental studies program description: <http://registrar.ucsc.edu/catalog/programs-courses/program-statements/envs.html>.

### COMBINED MAJOR IN EARTH SCIENCES/ANTHROPOLOGY (B.A.)

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 advisers in the Earth and Planetary Sciences and Anthropology Departments early if they have questions.

#### REQUIRED LOWER-DIVISION COURSES

Anthropology 1, 2, and 3  
Earth Sciences 5/L, or 10/L, or 20/L  
Mathematics 11A-B, 19A-B, or Applied Mathematics and Statistics 15A-B  
Five lower-division science cognate courses (plus laboratories) chosen from the following:  
BIOL 20A, BIOE 20B, BIOE 20C  
Chemistry 1A, 1B/M, 1C/N  
Physics 6A/L, 6B/M

#### REQUIRED UPPER-DIVISION COURSES

Earth Sciences 110A/L  
At least three elective courses (5+ credits) from upper-division Earth Sciences offerings must be completed. Earth Sciences 198 and 199 may not be used to satisfy this requirement.  
Any four five- to seven-credit upper-division electives listed under the Anthropology Department's Physical Anthropology and Archaeology Courses subdivision.  
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: 100, 101, 102, 104, 109, 116, 120, 125, 140, 146, 148, 150, 152, 160, 188A, 191A, 195; Anthropology courses are: 100, 170, 194B, 194L, and 194Y). Courses may simultaneously satisfy both the DC requirement and the upper-division Earth Sciences or Anthropology elective requirement.

#### COMPREHENSIVE REQUIREMENT

One of the following:  
Satisfactory completion of Anthropology 194-series (any senior seminar in physical anthropology or archaeology)  
Satisfactory completion of Earth Sciences 188A-B\*, Summer Field Internship and Geographic Information Systems with Applications to the Earth Sciences  
Satisfactory completion of a senior thesis (Earth Sciences 195) with faculty readers from both departments, which must include a significant element of independent research or original work and can only

## Earth and Planetary Sciences

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 (Earth Sciences 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.

\* Earth Sciences 188A-B has as prerequisites courses 109/L, 110A/L, and 110B/M.

### EARTH SCIENCES/ANTHROPOLOGY COMBINED MAJOR PLANNER

Year	Fall	Winter	Spring
1st (frsh)	ANTH 1	ANTH 2	ANTH 3
	College core		EART 10/L
2nd (soph)	Cog sci	MATH 11A or 19A or AMS 15A	MATH 11B or 19B or AMS 15B
	Cog sci	Cog sci	ANTH elective
3rd (jr)	EART 110A/L	EART elective	ANTH elective
	Cog sci	Cog sci	EART elective
4th (sr)	ANTH elective	EART elective	ANTH elective
	Sr comp	Sr comp	Sr comp

### HONORS

Honors in the major are determined by a review of grades (typically 3.50 or above) and narrative evaluations 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 majors with environmental studies and anthropology will be granted only when the committees in both departments are in agreement. 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

Achieving success in the Earth Sciences major is strongly correlated with successfully taking the required Foundation Classes and their associated 2-credit laboratories,

Earth Science 110A/L, Evolution of the Earth;

Earth Science 110B/M, Earth as a Chemical System.

If you are unsuccessful in passing your first attempt at these classes, past experience suggests that you might have difficulty successfully completing this major. We strongly recommend that you seek advising from the department or your college advisor. Two failures of one of these required gateway classes (or associated lab) is likely to preclude completion of the major.

### EPS 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.

See the table below for a summary of the courses involved in the introduction, development, and assessment of each Program Learning Outcome (PLO). The table summarizes program learning outcomes and the courses where they are introduced/developed (D) and assessed (A).

EART Course Number	Program Learning Outcome Number			
	1	2	3	4
5 or 10 or 20	D	D		
5L or 10L or 20L			D	D
110A (problem sets)			D	
110A (midterm, short essay questions)	D			
110A (midterm, quantitative questions)			D	
110A (final, short essay questions)	A			
110A (final, quantitative questions)			A	
110L (lab reports)	D			D
110B (lectures)		D		
110M (weekly quizzes)		D		
110M (final practical assessment)		A		
110B (final examination, rock identification)		A		
First to penultimate DC course (final paper)				D
Last DC course taken (final paper)				A

### MINOR REQUIREMENTS

Students can earn a minor in Earth sciences by taking Earth Sciences 5/L or 10/L or 20/L and five upper-division Earth sciences courses. Courses offering fewer than 5 credits (such as Earth Sciences 190 or 2-credit laboratories and independent studies) may not be counted toward the minor requirements, although additional coursework is always encouraged.

### GRADUATE PROGRAM

The graduate program in Earth and planetary sciences 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. Prospective students should take the Graduate Record Examination (GRE) General Test and have the scores sent electronically to the UCSC Division of Graduate Studies. 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.

**Thesis Track (Ph.D., M.S.).** In their first year, all thesis-track graduate students register for courses 203, Introductory Teaching Seminar; 204, Fundamentals of Earth and Planetary Sciences; 205, Introductory Graduate Seminar; 206, Great Papers in the Earth Sciences; and, in consultation with the graduate advising committee, choose at least one subject course focusing on specific Earth and planetary sciences content and one course focusing on quantitative analysis (from a list in the EPS Graduate Handbook). In subsequent years, all students participate in course 293, Graduate Research Seminar. Other course requirements are tailored to the individual student's academic background, professional experience, and plans for research. Master's degree students must take a minimum of 35 quarter credits of graduate and upper-division undergraduate courses (at least 20 of which are graduate-level and not including Earth Science 297, Independent Research) including the courses mentioned above. No specific number of course credits is required for the Ph.D., but ordinarily students put more of their effort into coursework during the first year of graduate study. It is recommended that all thesis-track graduate students attain some teaching experience while at UCSC.

Before the start of fall quarter, each first-year thesis track student must meet with his/her faculty adviser to determine a customized course list designed to improve breadth and enable research goals. Immediately afterwards, a meeting is scheduled with the graduate program director to finalize and approve this initial discussion with a written study plan. Yearly academic review meetings will then reassess the student's

progress in completing these courses and independent research, initially with the primary adviser but eventually with a reading committee.

To qualify for candidacy in the Ph.D. program, each student must pass an oral examination in his or her area of specialization by the end of their third year of graduate study, although students are strongly encouraged to take the examination earlier. The examination is based on a 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.

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. A public oral defense of the thesis is required prior to completion of the Ph.D.

The M.S. thesis is a scholarly contribution consisting of results of an original research project by the student. Students are strongly encouraged to prepare their results for publication in the peer-reviewed literature. The M.S. thesis must be completed by the end of the third year after entering the program, and students are strongly encouraged to complete their thesis earlier and to present the results of this work publicly.

**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 have a meeting with their faculty adviser in which they develop a study plan of at least nine courses, no more than one of which may be 297 or 298, and a statement of objectives. The plan must be approved by the graduate representative. Students are also limited to one Earth Sciences 290 pro-seminar course. It is expected that the course plan will comprise mainly graduate-level and quantitative, upper-level, undergraduate elective courses.

Coursework master'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.

There is no foreign-language requirement for either the M.S. or Ph.D. degree. However, many students in the Earth and planetary sciences find knowledge of one or more foreign languages necessary in their particular research and therefore study the appropriate language.

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 Division of Graduate Studies. For more information, see Graduate Studies at <http://eps.ucsc.edu/academics/grad-studies/index.html>.

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## EARTH AND PLANETARY SCIENCES FACULTY, RESEARCHERS, AND PROFESSIONAL INTERESTS

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**Erik Asphaug, Professor Emeritus**

**Terrance Blackburn, Assistant Professor**  
Geochemistry, thermochronology, tectonics

**Emily E. Brodsky, Professor**  
Earthquakes, volcanoes, fluid flow in fractured media

**Kenneth L. Cameron, Professor Emeritus**

**Patrick Y. Chuang, Professor**  
Clouds, aerosols and climate

**Matthew E. Clapham, Associate Professor**  
Paleobiology, geobiology

**Robert S. Coe, Professor Emeritus**

**Noah J. Finnegan, Associate Professor**  
Geomorphology, active tectonics

**Andrew T. Fisher, Professor**  
Hydrogeology, crustal studies, coupled flows, modeling

**Ian Garrick-Bethell, Assistant Professor**  
Planetary interiors, paleomagnetism

**Robert E. Garrison, Professor Emeritus**

**James B. Gill, Professor Emeritus**

**Gary A. Glatzmaier, Professor Emeritus**

**Gary B. Griggs, Distinguished Professor, Earth Sciences; Director, Institute of Marine Sciences**  
Coastal processes, hazards and engineering

**Jeremy K. Hourigan, Associate Professor**  
Thermochronology, structural geology, tectonics

**Elise Knittle, Professor**  
Mineral physics, experimental geophysics

**Paul L. Koch, Professor**  
Isotope geochemistry, paleobiology and ecology

## Earth and Planetary Sciences

**Don G. Korycansky, CODEP Research Planetary Scientist**

Planetary impacts, asteroid dynamics

**Mikhail Kreslavsky, CODEP Assistant Research Planetary Scientist**

Mars surface evolution and planetary data analysis

**Leo F. Laporte, Professor Emeritus**

**Thorne Lay, Distinguished Professor**

Seismology, geophysics

**J. Casey Moore, Professor Emeritus**

**Francis Nimmo, Professor**

Icy satellites, accretion, Mars, planetary geophysics

**Adina Paytan, Lecturer, IMS Research Scientist**

Biogeochemistry, paleoceanography, environmental and aquatic chemistry

**Dave Rubin, EPS, Researcher**

Geomorphology

**Hilde L. Schwartz, Senior Lecturer**

Vertebrate paleontology, environmental geology, paleoecology, chemosynthetic ecosystems

**Susan Y. Schwartz, Professor**

Seismology, geophysics, active tectonics

**Eli A. Silver, Professor**

Marine geology and geophysics, active tectonics, remote sensing

**Lisa Sloan, Professor Emerita**

**Othmar T. Tobisch, Professor Emeritus**

**Slawek M. Tulaczyk, Professor**

Glaciology and glacial geology, soil mechanics

**Steven N. Ward, IGPP Researcher Emeritus**

**Gerald E. Weber, Lecturer Emeritus**

**Quentin Williams, Professor**

Mineral physics, tectonophysics, experimental geochemistry

**Ru-Shan Wu, CSIDE Research Geophysicist**

Seismology, geophysics; wave propagation and subsurface imaging

**Xiao-Bi Xie, CSIDE Research Geophysicist**

Theoretical and applied seismology

**James C. Zachos, Professor**

Paleoceanography, marine stratigraphy

**Xi Zhang, Assistant Professor**

Planetary atmospheres, atmospheric chemistry

**Xixi Zhao, Lecturer, Earth Sciences; CSIDE Research Geophysicist**

Paleomagnetism and rock magnetism and their application to the history of Earth's magnetic field



**Kenneth W. Bruland, Professor Emeritus, Ocean Sciences**

**Weixin Cheng, Professor, Environmental Studies**

Soil ecology, agroecology, biogeochemistry, global change ecology

**Margaret (Peggy) L. Delaney, Professor, Ocean Sciences**

Paleoceanography, marine geochemistry

**A. Russell Flegal, Professor, Microbiology and Environmental Toxicology**

Anthropogenic perturbations of biogeochemical cycles, applications of isotopic tracers in anthropology and archaeology

**Jonathan Fortney, Professor, Astronomy and Astrophysics**

Planetary atmospheres and interiors, extrasolar planets

**Michael Loik, Associate Professor, Environmental Studies**

Plant physiological ecology, climate change ecology, biometeorology, ecohydrology

**A. Christina Ravelo, Professor, Ocean Sciences**

Stable isotope geochemistry and chemical oceanography, paleoclimatology

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## EARTH AND PLANETARY SCIENCES COURSES

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### LOWER-DIVISION COURSES

#### **1. Oceanography. S**

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 Ocean Sciences 1. (General Education Code(s): PE-E, IN.) G. Griggs

#### **2. Earth Catastrophes. F**

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. (Formerly course 80A.) (General Education Code(s): SI, T-2 Natural Sciences.) T. Lay

#### **3. Geology of National Parks. S**

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. (General Education Code(s): SI, IN.) S. Schwartz

#### **5. California Geology. F**

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 5L required for majors and minors. (General Education Code(s): SI, IN.) E. Knittle

#### **5L. California Geology Laboratory (1 credit). F**

Laboratory sequence illustrating topics covered in course 5 with particular emphasis on rock and mineral identification and map interpretation. Field trip. Laboratory three hours. Students are billed a materials fee. E. Knittle

#### **7. The History of Life. W**

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. (General Education Code(s): SI, IN.) P. Koch

#### **8. Planetary Discovery. S**

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. (General Education Code(s): SI, T-2 Natural

Sciences.) X. Zhang

#### **9. Earth History and Global Change. S**

Over the past 4.5 billion years, planet Earth has evolved in exciting ways. Environments, climates, and life forms have come and gone in fascinating combinations. Course examines changing physical, biological, and climatological conditions through geologic time, beginning with the evolution of the Earth through changes leading to the current state of the planet, and considers prospects for Earth's future. (Formerly course 80F). (General Education Code(s): PE-E, T2-Natural Sciences.) The Staff

#### **10. Geologic Principles. W**

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 10L required for majors and minors. (General Education Code(s): SI, IN.) T. Blackburn

#### **10L. Geologic Principles Laboratory (1 credit). W**

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. Students are billed a materials fee. T. Blackburn

#### **11. Earthquakes. F**

Causes and effects of earthquakes. How do we measure, mitigate, and try to predict earthquakes? Plate motion, frictional faulting, earthquake triggering, wave

## Earth and Planetary Sciences

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. Students are billed a materials fee. (Formerly course 80B.) (General Education Code(s): MF, T-2 Natural Sciences, Q.) The Staff

### **12. Introduction to Weather and Climate. \***

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. Offered in alternate academic years. (General Education Code(s): SR, T2-Natural Sciences, Q.) P. Chuang

### **20. Environmental Geology. S**

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. (General Education Code(s): SI, IN.) S. Tulaczyk

### **20L. Environmental Geology Laboratory (1 credit). S**

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. Students are billed a materials fee. S. Tulaczyk

### **65. Natural History of Dinosaurs. \***

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. (General Education Code(s): SI, IN.) H. Schwartz

### **81B. Fundamentals of Environmental Science. \***

Addresses major issues in physical and biological environmental sciences and provides tools to critically evaluate, debate, and make informed choices regarding one's own impact on the environment. Topics include: climate change, water resources, air pollution, evolution, ecology (from populations to ecosystems), and conservation. Quantitative problem solving is an integral part of this course. (Also offered as College Eight 81B. Students cannot receive credit for both courses.) (General Education Code(s): MF, IN, Q.) L. Fox, P. Chuang

### **98. Earth Sciences Internship. F,W,S**

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. May be repeated for credit. E. Silver

### **99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff  
**UPPER-DIVISION COURSES**

### **100. Vertebrate Paleontology. W**

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. Students are billed a materials fee. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and course 5 or 10 or 20 or Biology 20C, or Anthropology 1. Concurrent enrollment in course 100L is required. H. Schwartz

### **100L. Vertebrate Paleontology Laboratory (2 credits). W**

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. Concurrent enrollment in course 100 is required. H. Schwartz

## Earth and Planetary Sciences

### **101. Invertebrate Paleobiology. F**

An introduction to paleobiology; the use of fossil evidence to pose and solve evolutionary and geologic questions. Students are billed a materials fee. (Formerly The Fossil Record.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and course 5 or 10 or 20 or Biology 20C or Anthropology 1. Concurrent enrollment in course 101L is required. M. Clapham

### **101L. Invertebrate Paleobiology Laboratory (1 credit). F**

Systematics, ecology, and evolutionary history of the major groups of fossil-forming animals. Laboratory 3 hours and one 1-day field trip. (Formerly The Fossil Record Laboratory.) Concurrent enrollment in course 101 is required. M. Clapham

### **102. Marine Geology. \***

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 Ocean Sciences 280. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and course 5 or 10 or 20 or Biology 20C. A. Ravelo

### **104. Geologic Hazards. F**

The recognition, evaluation, and mitigation of geologic hazards: earthquakes and faulting, tsunamis, volcanism, landslides and mass movements, and flooding. Students are billed a materials fee. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and course 10/L or 5/L or 20/L. S. Schwartz

### **105. Coastal Geology. W**

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. Students are billed a materials fee. Prerequisite(s): course 5 or 10 or 20. G. Griggs

### **107. Remote Sensing of the Environment. W**

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(s): course 5 or 10 or 20. Enrollment limited to 36. E. Silver

### **109. Elements of Field Geology. F,S**

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 120, 130, 150, and required for 188A-B. May not be taken concurrently with course 120, 150, or 188. Students are billed a materials fee. (General Education Code(s): W satisfied by taking this course and courses 188A and 188B.) Enrollment restricted to majors and minors in Earth and planetary sciences and the combined majors with anthropology and environmental studies. Prerequisite(s): Satisfaction

of the Entry Level Writing and Composition requirements, course 5 or 10 or 20, and 5L or 10L or 20L, or by permission of instructor. Concurrent enrollment in 109L is required. Enrollment limited to 25. (F) H. Schwartz, (S) J. Hourigan

### **109L. Field Geology Laboratory (2 credits). F,S**

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. Concurrent enrollment in course 109 required. Enrollment restricted to majors and minors in Earth and planetary sciences and the combined majors with anthropology and environmental studies or by permission of instructor. Enrollment limited to 25. (General Education Code(s): PR-E.) (F) H. Schwartz, (S) J. Hourigan

### **110A. Evolution of the Earth. F**

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(s): courses 5 or 10 or 20, and 5L or 10L or 20L, and Mathematics 11A or Mathematics 19A or Applied Mathematics and Statistics 15A. (General Education Code(s): PE-E.) Q. Williams, J. Zachos

### **110B. Earth as a Chemical System. W**

The chemical properties of Earth materials and the chemical

## Earth and Planetary Sciences

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 Chemistry 1B. Prerequisite(s): courses 5, or 10, or 20, and 5L, or 10L, or 20L, and Chemistry 1B. E. Knittle

### **110C. The Dynamic Earth. S**

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. Students are billed a materials fee.

Prerequisite(s): course 5 or 10 or 20; and 5L or 10L or 20L; and course 111 or Mathematics 22 or 23A; and Physics 6A or 5A. E. Brodsky

### **110L. Evolution of the Earth Laboratory (2 credits). F**

Laboratory sequence illustrating topics covered in course 110A.

Emphasis is on quantifying and evaluating different phenomena related to thermal, tectonic, climatic, and evolutionary processes. Prerequisite(s): concurrent enrollment in course 110A. (General Education Code(s): PR-E.) Q. Williams, J. Zachos

### **110M. Earth as a Chemical System Laboratory (2 credits). W**

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(s): concurrent enrollment in course 110B. E. Knittle

### **110N. The Dynamic Earth Laboratory (2 credits). S**

Laboratory sequence illustrating topics covered in course 110C.

Prerequisite(s): concurrent enrollment in course 110C. E. Brodsky

### **111. Mathematics in the Earth Sciences. F**

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(s): courses 5 or 10 or 20, and Mathematics 11B or Mathematics 19B or Applied Mathematics and Statistics 15B. (General Education Code(s): Q.) W. Nimmo

### **112. Practical Geophysics. F**

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. Prerequisite(s): course 110C. E. Brodsky

### **116. Hydrology. \***

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. Students are billed a materials fee. Alternates annually with course 146. Enrollment restricted to majors and minors in Earth and planetary sciences and

the combined majors with anthropology and environmental studies. Prerequisite(s): course 5 or 10 or 20, Mathematics 11A or 19A or Applied Mathematics or Statistics 15A; and Physics 6A/L or 5A/L, or by permission of the instructor. Course 5L or 10L or 20L and Physics 6B/M are recommended. A. Fisher

### **118. Seismotectonics. W**

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(s): course 5 or 10 or 20; Mathematics 11B or 19B; and Physics 5A or 6A. Offered in alternate academic years. T. Lay

### **119. Introduction to Scientific Computing. W**

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). (Also offered as Astronomy and Astrophysics 119. Students cannot receive credit for both courses.) Prerequisite(s): Mathematics 11A or 19A or 20A or Applied Mathematics or Statistics 15A. (General Education Code(s): IN.) M. Krumholz

### **120. Sedimentology and Stratigraphy. S**

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 four Saturday field exercises. Students are billed a

## Earth and Planetary Sciences

materials fee. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and course 110A. Course 110B is recommended as preparation. May not be taken concurrently with course 109. M. Clapham

### **120L. Sedimentology and Stratigraphy Laboratory (2 credits). \***

Laboratory sequence illustrating topics in course 120, including sedimentary petrology, sedimentary structures, sequence stratigraphy, and geohistory analysis. Prerequisite(s): concurrent enrollment in course 120. M. Clapham

### **121. The Atmosphere. \***

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(s): Mathematics 11B or Mathematics 19B or Applied Mathematics and Statistics 15B, and Chemistry 1A, and Physics 5B or 6B. Offered in alternate academic years. P. Chuang

### **125. Statistics and Data Analysis in the Geosciences. W**

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. Offered in alternate academic years. (General Education Code(s): SR.) M. Clapham

### **127. Radiogenic Isotopes. \***

Introduces the systematics and applications of radiogenic isotopes. Topics include geochronology, isotopic tracers of crust, mantle and core differentiation, short-lived isotopic systems, and inorganic mass spectrometry. Practical exercises focus on reduction of isotopic data and interpretation. Prerequisite(s): course 110B. T. Blackburn

### **128. Isotopes: Fundamentals and Applications in Earth and Marine Sciences. \***

Explores the fundamentals and concepts of stable, radiogenic, and cosmogenic isotope chemistry with applications relevant to Earth, marine, and biological sciences. Prerequisite(s): course 110B or permission of instructor. J. Zachos

### **130. Igneous and Metamorphic Petrology. S**

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(s): course 110B. Concurrent enrollment in course 130L is required. E. Knittle

### **130L. Igneous and Metamorphic Petrology Laboratory (2 credits). S**

An introduction to optical mineralogy and the petrography of igneous rocks. (Formerly Magmas and Volcanos Laboratory.) Prerequisite(s): course 110B. Concurrent enrollment in 130 is required. E. Knittle

### **134. Thermochemistry of Geologic Systems. \***

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(s): course 110B. Offered in alternate academic years. Q. Williams

### **140. Geomorphology. W**

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(s): satisfaction of the Entry Level Writing and Composition requirements and course 110A. Concurrent enrollment in 140L is required. N. Finnegan

### **140L. Geomorphology Laboratory (2 credits). W**

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. Students are billed a materials fee. Prerequisite(s): Concurrent enrollment in course 140 is required. N. Finnegan

### **142. Engineering Geology for Environmental Scientists. \***

Introduction to the formation, composition, and classification of soils; the chemical interaction of soil and groundwater; and basic soil

## Earth and Planetary Sciences

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. Students are billed a materials fee. Prerequisite(s): course 5 or 10 or 20; Mathematics 11A or Mathematics 19A or Applied Mathematics or Statistics 15A. Offered in alternate academic years. S. Tulaczyk

### **146. Groundwater. S**

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. Students are billed a materials fee. Alternates annually with course 116. Enrollment restricted to majors and minors in Earth and planetary sciences and the combined majors with anthropology and environmental studies. Course 5L or 10L or 20L and Physics 6B/M are recommended as preparation. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; and course 5 or 10 or 20; and Mathematics 11A or 19A or AMS 15A; and Physics 6A/L (Physics 6B/M recommended); and Chemistry 1A/L, or by permission of the instructor. A. Fisher

### **148. Glaciology. W**

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. Students are billed a materials fee. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and courses 5 or 10 or 20; and Mathematics 11A or Mathematics 19A or Applied Mathematics or Statistics 15A. Offered in alternate academic years. S. Tulaczyk

### **150. Structural Geology. F**

Principles and methods of analysis of brittle and ductily deformed rocks. Includes descriptions of structures, field analysis of structures, and mechanics of deformation. Three day-long field trips on weekends. Students are billed a materials fee. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and course 110A or 110B; course 109 recommended; concurrent enrollment in course 150L is required. J. Hourigan

### **150L. Structural Geology Laboratory (2 credits). F**

Structural analysis of faults, folds, and maps. Use of stereographic projections. Cross section construction and balancing from field data. Concurrent enrollment in course 150 is required. J. Hourigan

### **152. Tectonics. W**

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. (Formerly Active Tectonics.)

Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and course 10 or 5 or 20 and 10L or 5L or 20L, and Physics 5A or 6A or equivalent per instructor permission. J. Hourigan

### **160. Planetary Science. F**

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(s): satisfaction of the Entry Level Writing and Composition requirements, and Mathematics 11B or Mathematics 19B or Applied Mathematics and Statistics 15B; and Physics 5A or 6A. I. Garrick-Bethell

### **162. Planetary Interiors. W**

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 course 262. Prerequisite(s): course 160; and course 111 or Mathematics 22 or 23A; and Physics 5C or 6C. Offered in alternate academic years. I. Garrick-Bethell

### **163. Planetary Surfaces. S**

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

## Earth and Planetary Sciences

course 263. Prerequisite(s): course 160. Enrollment limited to 20. Offered in alternate academic years. W. Nimmo

### **164. Planetary Atmospheres. S**

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 course 264.

Prerequisite(s): course 160.

Enrollment limited to 18. X. Zhang

### **172. Geophysical Fluid Dynamics. S**

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 course 272.

Students cannot receive credit for this course and course 272. (Also offered as Ocean Sciences 172.

Students cannot receive credit for both courses.) Prerequisite(s):

Physics 107 or Applied

Mathematics and Statistics 107;

Mathematics 22 or 23B

recommended. Offered in alternate academic years. C. Edwards

### **188A. Summer Field Internship. S**

Three weeks of summer field study in geologically complex regions in the White-Inyo Mountains of eastern California. Activities include geologic field mapping on topographic and photographic base maps, stratigraphy, petrology, and structure analysis. A fee is required for participation. Contact sponsoring agency for details.

Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; courses

109/L, 110A/L, and 110B/M.

Enrollment restricted to Earth sciences majors. Concurrent enrollment in course 188B is required. (General Education Code(s): W satisfied by taking this course and courses 109 and 188B.) Interview only via application filed with department. (General Education Code(s): PR-E.) H. Schwartz

### **188B. Geographic Information Systems with Applications to the Earth Sciences. S**

Introduction to basic principles of geographic information systems (GIS). Visualization of earthscapes with applications to problem-solving in the Earth sciences. Laboratory exercises in loading, manipulation, and interpretation of data sets. Field investigations of phenomena visualized in laboratory, including geological description, interpretation, and written report preparation. Lecture and laboratory portions of course occur during spring quarter. Field investigations and report-writing occur in the summer following spring quarter. A fee is required for participation. Contact sponsoring agency for details. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; courses 109/L, 110A/L, and 110B/M. Enrollment restricted to Earth sciences majors.

Concurrent enrollment in course 188A is required. (General Education Code(s): W satisfied by taking this course and courses 188A and 109.) Interview only via application filed with department. Enrollment limited to 25. N. Finnegan

### **190. Earth Sciences Mentorship (1 credit). F**

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. Enrollment restricted to Earth sciences, Earth sciences/anthropology, and environmental studies/Earth sciences majors. Enrollment limited to 24. May be repeated for credit. E. Silver

### **191A. Climate Change Science and Policy. S**

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. (Formerly course 191.) Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to senior majors in Earth sciences and the combined major with anthropology. P. Chuang

### **191B. Planetary Capstone. \***

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. (Formerly course 193.)

Prerequisite(s): course 160, and course 111 or Mathematics 22. Enrollment restricted to seniors and graduate students. W. Nimmo

## Earth and Planetary Sciences

### **194F. Education Capstone (2 credits). F,W,S**

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(s): Education 185C and 185L. Enrollment restricted to Earth and planetary sciences majors with a concentration in science education. The Staff

### **195. Senior Thesis. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to seniors.

Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. May be repeated for credit. (General Education Code(s): W.) The Staff

### **196B. Tutoring Earth Sciences in the University. F,W,S**

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. (Formerly Teaching Earth Sciences in the University.) The Staff

### **196C. Tutoring Earth Sciences in the University (2 credits). F,W,S**

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. (Formerly Teaching Earth Sciences in the University.) May be repeated for credit. The Staff

### **198. Earth Sciences Internship. F,W,S**

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 restricted to Earth sciences, Earth sciences/anthropology, and environmental studies/Earth sciences majors. May be repeated for credit. E. Silver

### **198F. Earth Sciences Internship (2 credits). F,W,S**

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 restricted to Earth sciences, Earth sciences/anthropology, and environmental studies/Earth sciences majors. May be repeated

for credit. The Staff

### **199. Tutorial. F,W,S**

Introduction to research in laboratory, field, or theoretical subjects as an independent study. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

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. May be repeated for credit. The Staff

## GRADUATE COURSES

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### **203. Introductory Teaching Seminar (1 credit). F**

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. Enrollment restricted to graduate students. The Staff

### **204. Earth and Planetary Sciences Foundations. F**

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. Enrollment is restricted to Earth sciences graduate students. Enrollment limited to 20. S. Schwartz

**206. Great Papers in the Earth Sciences. W**

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. Enrollment restricted to Earth sciences graduate students. T. Blackburn, Q. Williams

**207. Tectonics. \***

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 course 152. Students cannot receive credit for this course and course 152. Prerequisite(s): graduate standing or permission of instructor. J. Hourigan

**208. Methods in Paleoclimatology. \***

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. Enrollment restricted to graduate students. Offered in alternate academic years. The Staff

**210. Overview of Stellar and Planetary Formation and Evolution. \***

Overview of current understanding of star and planet formation and

evolution. Examines our solar system in the context of the galactic planetary census. Provides a uniform introduction to astronomy and Earth science planetary students. Enrollment restricted to graduate students. G. Laughlin

**213. Biogeochemical Cycles. F**

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. (Also offered as Ocean Sciences 213. Students cannot receive credit for both courses.) Enrollment 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. M. Delaney

**220. Ground Water Modeling. \***

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(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. Offered in alternate academic years. A. Fisher

**225. Statistics and Data Analysis in the Geosciences. W**

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 course 125. Enrollment is restricted to graduate students. M. Clapham

**229. Isotopic Methods in Environmental Science. \***

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. Enrollment restricted to graduate students. Enrollment limited to 25. P. Koch

**240. Communicating Science (3 credits). \***

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. Enrollment restricted to graduate students. Enrollment limited to 20. A. Paytan

**254. The Climate System. \***

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

## Earth and Planetary Sciences

readings, and discussion.

Enrollment restricted to graduate students. Offered in alternate academic years. P. Chuang

### **258. Deep Time Paleoclimates. S**

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). Enrollment restricted to graduate students. Enrollment limited to 15. Offered in alternate academic years. J. Zachos

### **260. Introductory Data Analysis in the Ocean and Earth Sciences. W**

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. (Also offered as Ocean Sciences 260. Students cannot receive credit for both courses.) Prerequisite(s): previous course in ocean or earth sciences is recommended. Enrollment restricted to graduate students; undergraduates with permission of instructor. C. Edwards

### **262. Planetary Interiors. W**

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 course 162. Enrollment restricted to graduate students. Enrollment limited to 20. Offered in alternate academic years. I. Garrick-Bethell

### **263. Planetary Surfaces. \***

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 course 163. Enrollment restricted to graduate students. Offered in alternate academic years. W. Nimmo

### **264. Planetary Atmospheres. W**

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 course 164. Enrollment restricted to graduate students. X. Zhang

### **265. Order of Magnitude Estimation. W**

Practice in making rough estimates and leading-order approximations in physical and chemical processes. Enrollment restricted to graduate students. Offered in alternate

academic years. W. Nimmo, P. Chuang

### **266. Geologic Signal Processing and Inverse Theory. F**

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. (Formerly Geological Signal Processing.) Enrollment restricted to graduate students. Enrollment limited to 15. May be repeated for credit. E. Brodsky

### **270. Global Seismology. F**

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. Enrollment restricted to graduate students. Offered in alternate academic years. T. Lay

### **271. Current Research Topics in Deep Earth Processes. \*\***

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

## Earth and Planetary Sciences

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. May be repeated for credit. T. Lay

### **272. Geophysical Fluid Dynamics. S**

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 course 172. (Also offered as Ocean Sciences 272. Students cannot receive credit for both courses.) Physics 227 is recommended as preparation. Enrollment restricted to graduate students. Offered in alternate academic years. C. Edwards

### **275. Magnetohydrodynamics. \***

Study of fluid dynamics and magnetic fields with a focus on convection and magnetic field generation in planets and stars. Students develop a computer program for modeling magneto-convection. Computer programming experience required. Enrollment restricted to graduate students. Offered in alternate academic years. The Staff

### **278A. Advanced Seismology. \***

Elastic wave propagation. Advanced topics in ray theory, WKB 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. Course designed for graduate students but available to qualified Earth sciences majors. Physics 110B and 114B are recommended as preparation. Enrollment restricted to graduate students. May be repeated for credit. T. Lay

### **280D. Short Course in Atmospheric/Climate Science (3 credits). \*\***

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. Enrollment restricted to graduate students. May be repeated for credit. P. Chuang

### **290. Proseminar.**

Special topics offered from time to time by visiting professors or staff members. May be repeated for credit. The Staff

### **290B. Topics in Glaciology. F**

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. Enrollment restricted to graduate students. May be repeated for credit. S. Tulaczyk

### **290C. Topics in Geophysics. F**

Different problems and approaches will be stressed from year to year such as geotectonics, paleomagnetism, or properties and processes in the mantle and core. Enrollment restricted to graduate students; qualified Earth sciences majors by permission of instructor. I. Garrick-Bethell

### **290D. Petrology and Plate Tectonics. \***

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. May be repeated for credit. The Staff

### **290E. Topics in Planetary Science. \***

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. Open to undergraduate majors with permission of instructor. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **290F. Topics in Coastal Processes (2 credits). W,S**

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. Enrollment restricted to graduate students. May be repeated for credit. G. Griggs

### **290G. Topics in Global Tectonics. \***

Explores different problems of special interest in global tectonics with the approach of integrating marine and terrestrial geologic and geophysical information. Course

## Earth and Planetary Sciences

designed for graduate students but available to qualified Earth sciences majors. May be repeated for credit. E. Silver

### **290H. Topics in Hydrogeology. F**

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. Offered in alternate academic years. May be repeated for credit. A. Fisher

### **290I. Topics in Geomorphology. S**

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. Enrollment restricted to graduate students; qualified undergraduates may enroll by permission of instructor. May be repeated for credit. N. Finnegan

### **290J. Topics in Earthquake Physics. W**

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. Enrollment restricted to graduate students and advanced undergraduates. E. Brodsky

### **290K. Paleontology Seminar (3 credits). \***

Seminar discussion based on current readings in the literature around some topic in the history and evolution of life. Course designed for graduate students but

available to qualified upper-division science students. Offered in alternate academic years. May be repeated for credit. M. Clapham, P. Koch

### **290L. Topics in Climate Change. \***

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. Enrollment restricted to graduate students. Enrollment limited to 20. May be repeated for credit. L. Sloan

### **290M. Topics in Atmospheric Science. \***

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. (Formerly Topics in Atmospheric Chemistry.) Designed for graduate students, but qualified undergraduates may enroll with permission of instructor. May be repeated for credit. P. Chuang

### **290N. Topics in Mineral Physics. \***

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. Enrollment restricted to graduate students and qualified Earth sciences majors by permission of instructor. May be repeated for credit. E. Knittle

### **290P. Interdisciplinary Topics in the Earth Sciences. \***

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(s): graduate standing or permission of instructor. Course designed for graduate student but available to qualified Earth sciences majors. May be repeated for credit. S. Schwartz

### **290Q. Topics in Outer Solar System. \***

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. Enrollment restricted to graduate students. May be repeated for credit. W. Nimmo

### **290R. Topics in the Chemistry and Physics of the Earth. \***

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 designed for graduate students but available to qualified Earth sciences majors. May be repeated for credit. Q. Williams

### **290T. Current Research Topics in Paleoceanography and Paleoclimatology. \***

Students and instructor lead discussions of recent and significant problems in paleoceanography and paleoclimatology. Articles

## Earth and Planetary Sciences

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 designed for graduate students but available to qualified Earth sciences majors. J. Zachos

### **290U. Topics in Thermochronology. \***

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. Enrollment restricted to graduate students. Enrollment limited to 20. J. Hourigan

### **290X. Topics in Modeling Planetary Interiors. \***

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). Course designed for and enrollment restricted to

graduate students, but available to qualified science majors. May be repeated for credit. G. Glatzmaier

### **292. Seminar (no credit). F,W,S**

Weekly seminar attended by faculty, graduate students, and upper-division undergraduate students. The Staff

### **293. Graduate Research Seminar (1 credit). S**

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. Enrollment restricted to graduate students. May be repeated for credit. Q. Williams

\* Not offered in 2015-16

\*\* Quarter offered not yet determined

Revised: 09/01/15

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# EAST ASIAN STUDIES

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2015-16 General Catalog

Department of History

201 Humanities

(831) 459-2982

<http://eastasianstudies.ucsc.edu>

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## PROGRAM DESCRIPTION

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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 UCSC 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 one of two historical surveys—History 40A, Early Modern East Asia, or History 40B, The Making of Modern East Asia—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, go to

<http://eastasianstudies.ucsc.edu>.

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### REQUIREMENTS FOR THE MINOR

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**Language.** All East Asian studies minors are expected to gain proficiency in Chinese or Japanese language. Students with prior knowledge of Chinese or Japanese are required to complete a language placement exam. Instructions for the placement exam can be found on the Languages and Applied Linguistics web site: <http://language.ucsc.edu>. 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 the sophomore year. Students may also pursue study abroad opportunities as a way of acquiring Chinese or Japanese language instruction (see below).

All East Asian studies minors are required to complete at least two upper-division courses in Chinese or Japanese language instruction. Additional upper-division offerings in Chinese or Japanese language instruction may be applied to the upper-division electives requirements (see below).

**Core Courses.** One required core course: History 40A, Early Modern East Asia, or History 40B, The Making of Modern East Asia.

**Upper-Division Electives.** Three additional upper-division courses from the East Asian studies curriculum, one of which may be an individual study (course 199).

A minimum of 25 upper-division units must be completed within the East Asian studies minor course requirements.

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### STUDY ABROAD

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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. All students interested in studying abroad should meet with the East Asian Studies director prior to their departure. Students who participate in study abroad are required to complete a language placement exam upon their return. Instructions for the placement exam can be found on the Languages and Applied Linguistics web site: <http://language.ucsc.edu>. For more information on the

program, see the UC Education Abroad Program (EAP) web sites: UCSC—<http://ieo.ucsc.edu/programs->

[abroad/index.html](http://ieo.ucsc.edu/programs-), and UC system-wide—<http://eap.ucop.edu/>.

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## EAST ASIAN STUDIES ASSOCIATED FACULTY

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**Noriko Aso, Associate Professor of History**

Japanese social, intellectual, and cultural history, material culture, colonialism, nationalism, gender, race and ethnicity

**Dilip Basu, Professor Emeritus of History**

**Raoul Birnbaum, Professor of History of Art and Visual Culture**

Buddhist studies, especially Chinese practices from medieval times to the present; religion and visual culture in China

**Nancy Chen, Professor of Anthropology**

Medical anthropology, visual anthropology, urban anthropology, Asian American identity, mental health, food, China

**Alan Christy, Associate Professor of History**

Early modern and modern Japan; history of social sciences, colonialism, nationalism; Okinawa

**Christopher Connery, Professor of Literature**

World literature and cultural studies; globalism and geographical thought; the 1960s; Marxism; pre-modern and modern Chinese cultural studies; cultural revolution

**Sakae Fujita, Continuing Lecturer of Languages**

Foreign language education, drama in education

**Hiroshi Fukurai, Professor of Sociology**

Citizen participation in law, race and the law, indigenous approach to international law, decolonialism, Japan and East Asia, advanced quantitative methods, survey research

**K.C. Fung, Professor of Economics**

International trade and finance, WTO, foreign direct investment, global environmental economics, and Asia/Pacific economies

**Per Gjerde, Professor Emeritus of Psychology**

**June Gordon, Professor of Education**

Urban education; international comparative education; the impact of economics, culture and politics on educational attitudes and expectations of immigrants; marginalized youth; schooling and society in Japan, China, India, the U.K., and the U.S.A.; sociology of education

**Gail B. Hershatter, Professor of History**

Modern Chinese social and cultural history; labor history; gender history; history of sexuality; feminist theory; history, memory, and nostalgia

**Christine Hong, Assistant Professor of Literature**

Asian American literature and cultural criticism; African American literature and black freedom studies; Korean diasporic cultural production; Pacific Rim studies; postcolonial theory; critical race theory; human rights discourse; law and literature; narrative theory; film and visual studies

**Emily Honig, Professor of History**

Gender, sexuality and ethnicity in modern China; comparative labor and urban history

**Minghui Hu, Associate Professor of History**

Early Modern China (1600–1900)

**Junko Ito, Professor of Linguistics**

Phonology, morphology, Germanic languages, Japanese

**Stacy Kamehiro, Associate Professor of History of Art and Visual Culture**

Visual cultures of Oceania; colonial cultures; visual culture and identity; gender studies; museums and collecting; material culture

**Hi Kyung Kim, Associate Professor of Music**

Composition, theory, contemporary music, analysis, orchestration, Korean music, world music composition, Founder and Artistic Director, Pacific Rim Music Festival

**L.S. Kim, Associate Professor of Film and Digital Media**

Television history and theory, racial discourse, feminist criticism, Asian-American cultural theory and production, industrial practices and social change in both mainstream Hollywood and alternative media

**Paul Lubek, Professor Emeritus of Sociology**

**Boreth Ly, Assistant Professor of History of Art and Visual Culture**

Visual cultures of Southeast Asia and its diaspora: religions and materiality, theory of visual narrative, the politics of cultural translation; (post) colonial and cultural studies; issues of gender, sexuality, race, and trauma

**David Keenan, Continuing Lecturer of Languages**

Chinese language, fiction, and history

**Shigeko Okamoto, Professor of Languages**

Sociolinguistics, discourse analysis, pragmatics, language and gender, foreign language pedagogy, Japanese linguistics

**Benjamin Read, Associate Professor of Politics**

Comparative politics with special interest in the politics of China; theories of associations and social networks; communist and post-communist states; political participation and collective action

**Lisa Rofel, Professor of Anthropology**

Critical theory, anthropology of modernity, popular/public culture, gender and sexuality, queer theory, transnational capitalism, postcolonial and transnational feminism, China

**Dana Y. Takagi, Professor of Sociology**

Social inequality, affect, religion, race, quantitative analysis

**Yiman Wang, Associate Professor of Film and Digital Media**

Theory of difference; film history and theory; colonial/semi-colonial/postcolonial/postsocialist modes of media production and exchange; border-crossing film remakes; silent cinema; translation theory and cinema; acting theory/practice and ethnic star studies with focus on Anna May Wong; transnational connections and ramifications of Chinese cinema and documentary; fan culture; East Asian cinemas

**Rob Wilson, Professor of Literature**

Transnational and postcolonial literatures, especially as located and transformed in Asia/Pacific; cultural-political emergences as posited against empires of globalization; cultural poetics of America in the Pacific and Oceania; the sublime, Longinus to Hiroshima; poetics of experimental writing, especially poetry; the poetry and cultural poetics of Bob Dylan; Beat beatitude, social and literary, from Jesus to Juliana Spahr et al; San Francisco as Global City, with its literature read as archive of vision and critique; Pacific Rim cities from Hong Kong and Seoul to Taipei, Kaohsiung, Shanghai, Honolulu, San Francisco, and Los Angeles

**Karen Yamashita, Professor of Literature**

History and anthropology of Japanese immigration to Brazil; Asian American literature; modern fiction; playwriting

**Alice Yang, Associate Professor of History**

Historical memory, Asian American history, gender history, race and ethnicity, 20th-century U.S., oral history

Revised 09/01/2015

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# ECONOMICS

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2015-16 General Catalog

401 Engineering 2

(831) 459-2743

<http://economics.ucsc.edu>

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## PROGRAM DESCRIPTION

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An understanding of economics is a vital component of a liberal arts education and a necessity for anyone interested in such areas as business, environmental policy, economic development, immigration, educational reform, international competitiveness and trade, or transformations in the global economy.

The programs offered by the UCSC Economics Department are designed to acquaint students with a broad range of economic issues and with the tools economists use. The department offers the following majors:

- Economics B.A.
- Business management economics B.A.
- Global economics B.A.
- The department also offers the following combined majors:
  - Economics/Mathematics B.A.
  - Environmental studies/Economics B.A.
  - Latin American and Latino studies/Global economics B.A.
- A minor in economics is also available.

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.

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### GENERAL REQUIREMENTS

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#### QUALIFICATION FOR AN ECONOMICS MAJOR

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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 take three courses prior to petitioning for entry to an economics major: Economics 1 (Introductory Microeconomics) and Economics 2 (Introductory Macroeconomics) and one of the following calculus courses: Economics/Applied Mathematics and Statistics 11A, Mathematical Methods for Economists; or Mathematics 11A, Calculus with Applications; or Mathematics 19A, Calculus for Science, Engineering, and Mathematics. Students who have a combined grade-point average (GPA) of 2.8 or better in Economics 1, 2, and the first calculus course qualify for the economics major upon applying. Students receiving a grade of NP, C-, D+, D, D-, or F in one of the courses required for admission to the major may only declare once they have passed the same or equivalent course with a grade of C or better. Students who receive two grades of NP, C-, D+, D, D-, or F in the required courses are not eligible to declare the major. Students are encouraged to apply to the major as soon as they have satisfactorily completed these three courses. Equivalent courses may be taken at other universities or community colleges. Students should check on [assist.org](http://assist.org) to determine whether a transfer course is designated as equivalent to Economics 1, 2 or the first required calculus course. Transfer students are strongly encouraged to ask the department to review such courses prior to matriculation at UCSC, since an offer of admission to UCSC does not automatically imply admission to the economics major.

Students may petition for admission to the major by filling the Petition for Major/Minor Declaration and the UCSC Academic Planning form and by supplying evidence of their grades in the three pre-major courses.

Students who have a GPA lower than 2.8 in Economics 1, 2, and the calculus course are not eligible to declare an economics major. Students who are not eligible to declare the major may appeal this decision by submitting a letter of appeal to the department within 15 days of the denial of the declaration. Within 15 days of the receipt of the appeal, the department will notify

## Economics

the student, college and Office of the Registrar of the decision. Please check the department web site (<http://economics.ucsc.edu>) for further information on declaring a major or appealing ineligibility.

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.

### CORE REQUIREMENTS FOR ALL ECONOMICS MAJORS

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Economics 1 and 2, 11A, 11B, 100A (or 100M), 100B (or 100N), 113, and Applied Mathematics and Statistics 5 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 Economics 1, 2, 11A, 11B, and preferably 100A, 100B, and 113 by the end of their sophomore year. Students are also encouraged to choose the letter grade option when taking these courses.

### MATHEMATICS AND STATISTICS CONTENT REQUIREMENT

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Mathematics: Successful completion of Economics 11A and 11B, also offered as Applied Mathematics and Statistics 11A and 11B, (or equivalent) is required of all economics majors and is prerequisite to Economics 100A (or 100M), 100B (or 100N), and 113. Therefore, students are advised to take Economics 11A and 11B or their equivalent as early as possible in their undergraduate career. Mathematics 11A-B and 22 or 23A, or 19A-B and 22 or 23A, are acceptable equivalents to Economics 11A and 11B. Students may also complete the mathematics requirement by taking Mathematics 11A or Mathematics 19A, and then Economics 11B or Applied Mathematics and Statistics 11B. Students planning to pursue graduate work in economics or business should seriously consider more intensive mathematical training; consult an adviser.

Transfer students interested in the combined Economics/Mathematics major are encouraged to complete as many lower-division (mathematics and statistics) courses as they can prior to transferring. The courses need to be equivalent to Math 19A, 19B, 23A and 23B.

Statistics: Applied Mathematics and Statistics 5, Statistics or

Applied Mathematics and Statistics 7, Statistical Methods for Biological, Environmental and Health Sciences, or

Computer Engineering 7, Statistical Reasoning in the Age of the Internet

### COMPREHENSIVE REQUIREMENT

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The comprehensive requirement for the economics major and the combined economics/mathematics major is satisfied by passing the following intermediate core courses with grades of C or better here at UCSC: Economics 100A or 100M, and 100B or 100N, and 113. Students may elect to complete a senior thesis with consent of an instructor in addition to completing the intermediate core courses.

### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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All undergraduate majors must satisfy the campus' Disciplinary Communication (DC) requirement. The DC requirement in economics is satisfied by completing Economics 104, Is There Truth in Numbers: The Role of Statistics in Economics; or Economics 197, Economic Rhetoric. Students in the combined economics/mathematics major may also satisfy the requirement by completing Mathematics 100, Mathematical Proof, and either Mathematics 194, Senior Seminar, or Mathematics 195, Senior Thesis.

### INDEPENDENT STUDY

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Students are encouraged to petition for independent study on topics of special interest to them. Economics 199, Tutorial, may be used as only one of the upper-division courses required for the major or minor.

### FIELD-STUDY PROGRAM

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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 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 100A (or 100M), 100B (or 100N), and 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 field study requires 12 hours per week spent working 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 hours spent at the field placement.

## Economics

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 (193 and 198) 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 401 Engineering 2; or e-mail [econintern@ucsc.edu](mailto:econintern@ucsc.edu). Web address: <http://economics.ucsc.edu>

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### TRANSFER STUDENTS

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A student transferring to UCSC may fulfill some of the requirements for the major by completing equivalent courses, with a grade of C or better, at another recognized institution. Please refer to the section on Admission to the Major and Minor for specific admission requirements for the Economics majors.

Students should check on [assist.org](http://assist.org) for already established equivalency agreements between UC and the California community colleges. For courses not already articulated through [assist.org](http://assist.org), transfer students must present their Transfer Credit Summary (available on the student portal) and course syllabi or descriptions to an Economics Department adviser. The department approves courses applicable for economics prerequisites and major requirements.

All transfer students must complete the three-course senior comprehensive requirement (and the DC requirement as stated previously) at UCSC. Economics and global economics majors must take at least two of their upper-division economics electives at UCSC. Business management economics majors must take at least three of their upper-division economics electives at UCSC, one of which must be 101, 133, or 135. Courses taken for credit elsewhere may not be repeated for credit here.

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### COMBINED MAJORS

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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.

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### PROGRAM LEARNING OUTCOMES

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Program learning outcomes for economics, economics and mathematics, business management economics, and global economics majors:

1. **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.
2. **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.
3. **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.
4. **Specialized Knowledge and Application of Skills:** Students are expected to develop critical and quantitative thinking skills specific to business and accounting.
5. **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.

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### ECONOMICS PROGRAM DESCRIPTION

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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

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.

### ECONOMICS MAJOR REQUIREMENTS

Students who major in economics are required to take the following courses:

1, Introductory Microeconomics: Resource Allocation and Market Structure

2, Introductory Macroeconomics: Aggregate Economic Activity

11A, Mathematical Methods for Economists I (or equivalent)

11B, Mathematical Methods for Economists II (or equivalent)

100A, or 100M Intermediate Microeconomics

100B, or 100N Intermediate Macroeconomics

113, Introduction to Econometrics

197, Economic Rhetoric or Economics 104, Is There Truth in Numbers: The Role of Statistics in Economics

Applied Mathematics and Statistics 5 Statistics or Applied Mathematics and Statistics 7/L Statistical Methods for the Biological, Environmental, and Health Sciences;

and four additional upper-division economics courses, at least three of which must be selected from the following:

105, Macroeconomic Theory

114, Advanced Quantitative Methods

120, Economic Development

121, Economic Growth

125, Economic History of the U.S.

126, Why Economies Succeed or Fail

128, Poverty and Public Policy

130, Money and Banking

\*131, International Financial Markets

\*133, Security Markets and Financial Institutions

\*135, Corporate Finance

137, Performing Arts in the Public and Private Economy

140, International Trade

141, International Finance

142, Advanced Topics in International Finance

143, Policy Issues in the International Economy

148, Latin American Economies

149, The Economies of East and Southeast Asia

150, Public Finance

156, Health Care and Medical Economics

159, The Economics of Organizations

160A, Industrial Organization

160B, Government and Industry

165, Economics as an Experimental Science

166A, Game Theory and Applications I

166B, Game Theory and Applications II

169, Economic Analysis of the Law

170, Environmental Economics

171, Natural Resource Economics

175, Energy Economics

180, Labor Economics

183, Women in the Economy

184, Labor Wars in Theory and Film

185, The Value and Support of the Arts: Challenges and Opportunities in American Society

189, Political Economy of Capitalism

190, Senior Proseminar

\* Students can count **one** of these three courses toward the minimum of four economics electives.

Courses 191, 192, 193, 193F, 198, and 198F may not be used to meet major requirements. Either course 195 or 199 may be used to fill one of the four upper-division elective major requirements. Other electives are listed under the Business Management Economics program description.

### MINOR REQUIREMENTS

Students earn a minor in economics by completing the following requirements:

ECON 1, Introductory Microeconomics: Resource Allocation and Market Structure

ECON 2 Introductory Macroeconomics: Aggregate Economic Activity

ECON/AMS 11A, Mathematical Methods for Economists I

ECON/AMS 11B, Mathematical Methods for Economists II

Applied Mathematics and Statistics 5, Statistics; or Applied Mathematics and Statistics 7/L, Statistical Methods for the Biological, Environmental, and Health Sciences; or Computer Engineering 7, Statistical Reasoning in the Age of the Internet

## Economics

ECON 100A/ 100M Intermediate Microeconomics

ECON 100B/100N Intermediate Macroeconomics

ECON 113 Introduction to Econometrics

Three additional upper-division economics electives.

Economics 191, 192, 193, 193F, 198, and 198F may not be used to meet minor requirements.

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### BUSINESS MANAGEMENT ECONOMICS PROGRAM DESCRIPTION

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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. Particular areas of strength of the program are accounting, finance, and technology 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.

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 advisers) 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.

In cooperation with the UC Education Abroad Program (EAP), opportunities are available for students to take some business courses (taught in English) in Europe, Mexico, and Hong Kong. Students should ask the Economics Department for additional information about these programs.

Students who are committed to the major early in their academic career should plan to complete Economics 1, 2, 10A, 10B, 11A, 11B and preferably 100A, 100B, and 113 no later than the end of their sophomore year.

## BUSINESS MANAGEMENT ECONOMICS MAJOR REQUIREMENTS

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**Introductory and core requirements.** Students who major in business management economics are required to take the following courses:

1, Introductory Microeconomics: Resource Allocation and Market Structure

2, Introductory Macroeconomics: Aggregate Economic Activity

10A, Economics of Accounting (or equivalent, see under General Requirements)

10B, Economics of Accounting (or equivalent, see under General Requirements)

11A, Mathematical Methods for Economists I (or equivalent)

11B, Mathematical Methods for Economists II (or equivalent)

100A or 100M, Intermediate Microeconomics

100B or 100N, Intermediate Macroeconomics

113, Introduction to Econometrics

197, Economic Rhetoric; or ECON 104, Is There Truth in Numbers: The Role of Statistics in Economics

Applied Mathematics and Statistics 5, Statistics; or Applied Mathematics and Statistics 7/L, Statistical Methods for the Biological, Environmental, and Health Sciences; or Computer Engineering 7, Statistical Reasoning in the Age of the Internet

**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):

#### Computer Engineering

12/L, Computer Systems and Assembly Language

80N, Introduction to Networking and the Internet

#### Computer Science

10, Introduction to Computer Science

12A/L, Introduction to Programming

5C, Introduction to Programming in C++ (formerly CMPS 60 N)

5J, Introduction to Programming in Java (formerly CMPS 60 G)

5P, Introduction to Programming in Python

80B, Systems and Simulation

#### Technology and Information Management

50, Business Information Systems

58, Systems Analysis and Design

## Economics

### Economics

216, Applied Econometric Analysis I (with permission of instructor)

**Note:** Students with no prior programming experience are encouraged to take Computer Science 5J and Computer Science 10 rather than Computer Science 12A/L.

**Upper-division electives.** Students are required to take five additional courses: four in business management and one other economics elective. Students must choose four courses from the following list; at least one of the four must be a course designated with an asterisk (\*).

\*101, Managerial Economics

110, Managerial Cost Accounting and Control

111A, Intermediate Accounting I

111B, Intermediate Accounting II

112, Auditing and Attestation

115, Introduction to Management Sciences

117A, Tax Factors for Individuals

117B, Tax Factors for Business and Investment

119, Advanced Accounting

131, International Financial Markets

\*133, Security Markets and Financial Institutions

\*135, Corporate Finance

136, Business Strategy

138, The Economics and Management of Technology and Innovation

139A, Economics of Electronic Commerce

139B, E-Commerce Strategy

#159, The Economics of Organizations

#160A, Industrial Organization

#160B, Government and Industry

161A, Marketing

161B, Marketing Research

164, Economics and the Telecommunications Industry

188, Management in the Global Economy

194, Advanced Topics in Management

# Students can use **one** of these courses as either a business management elective or an economics elective, but the course cannot be counted twice.

Students must choose the remaining one course from the upper-division economics electives listed for the economics major (see preceding page).

Courses 191, 192, 193, 193F, 198, and 198F may not be used to meet major requirements. Either course 195 or

199 may be used to fill one of the five elective upper-division major requirements.

**Field study.** One quarter of field study is strongly recommended. Placements and credit for course 193 or 198 are arranged through the economics field-study coordinator. See above under Field-Study Program description.

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## GLOBAL ECONOMICS PROGRAM DESCRIPTION

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Global economics is an interdisciplinary major designed to prepare students to 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.

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## GLOBAL ECONOMICS MAJOR REQUIREMENTS

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**Introductory and core requirements.** Students who major in global economics are required to take the following courses:

1, Introductory Microeconomics: Resource Allocation and Market Structure

2, Introductory Macroeconomics: Aggregate Economic Activity

11A, Mathematical Methods for Economists (or equivalent)

11B, Mathematical Methods for Economists (or equivalent)

100A or 100M, Intermediate Microeconomics

100B or 100N, Intermediate Macroeconomics

113, Introduction to Econometrics

197, Economic Rhetoric or Economics 104, Is There Truth in Numbers: The Role of Statistics in Economics Applied Mathematics and Statistics 5, Statistics; or Applied Mathematics and Statistics 7/L, Statistical Methods for the Biological, Environmental, and Health Sciences; or Computer Engineering 7, Statistical Reasoning in the Age of the Internet

Students are strongly recommended to complete courses 100A (or 100M), 100B (or 100N), and 113 prior to study abroad. In addition, majors must have language study, area study, and overseas study, as described below.

Courses 191, 192, 193, 193F, 198 and 198F may not be used to meet major requirements. Either course 195 or

## Economics

199 may be used to fill one of the four elective upper-division major requirements.

**Upper-division requirements.** Four additional upper-division courses are required. Please see the entire economics course list. These may include approved courses offered by other departments.

At least one of the four courses must be selected from the following three:

120, Economic Development

140, International Trade

141, International Finance

In addition, at least one course must be chosen from the following departmental listings:

### Economics

120, Economic Development

121, Economic Growth

126, Why Economies Succeed or Fail: Lessons from Western and Japanese History

131, International Financial Markets

140, International Trade

141, International Finance

142, Advanced Topics in International Economics

143, Policy Issues in the International Economy

148, Latin American Economies

149, The Economies of East and Southeast Asia

188, Management in the Global Economy

The other two required electives may be chosen from any upper-division economics courses.

The global economics major has three additional elements:

1. **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.
2. **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;

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 adviser for the global economics major.

3. **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 (EAP). Numerous overseas study sites are available through EAP. Students desiring to fulfill their required study abroad through EAP must apply directly to the EAP office for the selected program and are subject to the admission requirements determined by UC EAP. In countries and at universities where EAP 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.

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## COMBINED ECONOMICS/MATHEMATICS PROGRAM DESCRIPTION

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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.

## Economics

### ECONOMICS/MATHEMATICS MAJOR REQUIREMENTS

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#### **Economics Required Courses**

- 1, Introductory Microeconomics: Resource Allocation and Market Structure
- 2, Introductory Macroeconomics: Aggregate Economic Activity
- 100A or 100M, Intermediate Microeconomics
- 100B or 100N, Intermediate Macroeconomics
- 113, Introduction to Econometrics

**DC requirement** (see statement under [General Requirements](#))

Applied Mathematics and Statistics 5, Statistics; or Applied Mathematics and Statistics 7/L, Statistical Methods for the Biological, Environmental, and Health Sciences; or Computer Engineering 7, Statistical Reasoning in the Age of the Internet

#### **Economics elective courses**

(choose three from the following list)

- 101, Managerial Economics
- 114, Advanced Quantitative Methods
- 115, Introduction to Management Sciences
- 120, Economic Development
- 121, Economic Growth
- 125, Economic History of the U.S.
- 126, Why Economies Succeed or Fail
- 128, Poverty and Public Policy
- 130, Money and Banking
- 131, International Financial Markets
- 133, Security Markets and Financial Institutions
- 135, Corporate Finance
- 136, Business Strategy
- 137, Performing Arts in the Public and Private Economy
- 138, Economics and Management of Technology and Innovation
- 139A, Economics of Electronic Commerce
- 139B, E-Commerce Strategy
- 140, International Trade
- 141, International Finance
- 142, Advanced Topics in International Finance
- 148, Latin American Economies
- 149, The Economies of East and Southeast Asia
- 150, Public Finance
- 156, Health Care and Medical Economics
- 159, The Economics of Organizations

- 160A, Industrial Organization
- 161A, Marketing
- 164, Economics and the Telecommunications Industry
- 165, Economics as an Experimental Science
- 166A, Game Theory and Applications I
- 166B, Game Theory and Applications II
- 169, Economic Analysis of the Law
- 170, Environmental Economics
- 171, Natural Resource Economics
- 175, Energy Economics
- 180, Labor Economics
- 183, Women in the Economy
- 184, Labor Wars in Theory and Film
- 188, Management in the Global Economy
- 189, Political Economy of Capitalism

#### **Mathematics Required Courses**

- Mathematics 19A, Calculus for Science, Engineering, and Mathematics
- Mathematics 19B, Calculus for Science, Engineering, and Mathematics
- Mathematics 21, Linear Algebra
- Mathematics 22, Calculus of Several Variables or 23A and 23B, Multivariable Calculus
- Mathematics 100, Mathematical Proof
- Mathematics 105A, Real Analysis

#### **Mathematics electives**

(choose two from the following list)

- Mathematics 105B, Real Analysis
- Mathematics 106, Systems of Ordinary Differential Equations
- Mathematics 107, Partial Differential Equations
- Mathematics 114, Introduction to Financial Mathematics
- Mathematics 117, Advanced Linear Algebra
- Mathematics 142, Introduction to Topology
- Mathematics 145/L, Chaos Theory
- Mathematics 194, Senior Seminar
- Mathematics 195, Senior Thesis
- Applied Mathematics and Statistics 114, Introduction to Dynamical Systems
- Applied Mathematics and Statistics 131, Introduction to Probability Theory
- Applied Mathematics and Statistics 132, Statistical Inference

## Economics

Applied Mathematics and Statistics 147, Computational Methods and Applications

\*Students in the combined economics/mathematics major may also satisfy the DC requirement by completing Mathematics 100, Mathematical Proof, and either Mathematics 194, Senior Seminar; or Mathematics 195, Senior Thesis

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### ADDITIONAL PREPARATION FOR THE MAJOR

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Students interested in the combined major must meet a minimum GPA requirement in Economics 1 and 2 (and the first calculus course). Transfer students should check [assist.org](http://assist.org) for agreements with California community colleges about economics and mathematics courses. Students who have met all articulations before transferring will need at least six economics and four to five mathematics classes at UCSC to complete the major.

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### HONORS IN THE MAJOR

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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—courses 100A/M, 100B/N, and 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.

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## GRADUATE PROGRAMS

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### MASTER'S PROGRAM IN APPLIED ECONOMICS AND FINANCE

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The master of science (M.S.) program in applied economics and finance is designed for students who want analytical graduate training that prepares them for careers in business, government, international and domestic banking, consulting firms, and nonprofit organizations. The program is unique in its focus on graduate-level economics training for practical applications and its emphasis on communication skills. The curriculum stresses the application of microeconomic and macroeconomic concepts, statistical techniques, finding and using data sources, working out substantial practical applications, developing writing and reporting skills, and presenting material orally before an audience. The program differs from typical master of business administration (M.B.A.) programs by preparing students to meet the increasing technical demands of private- and public-sector employers through comprehensive coursework in economic analysis.

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 Cisco Systems, Seagate Technology, Google, Sony Computer Entertainment, Plantronics, Wells Fargo, all of the big four accounting firms, McKesson Corp., Pepsi Corp., Visa, Square Trade, the California Franchise Tax Board, Guardian News (U.K.), 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

### Courses and Program 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.

<b>Courses and Program Requirements</b>		
<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
200 Microeconomic Analysis	217 Applied Econometric Analysis II	201 Applications Microeconomics
202 Macroeconomic Analysis	233 Finance	236 Financial Engineering
216 Applied Econometric Analysis	Master's elective	Master's elective
294A Applied Economics Lab	294A Applied Economics Lab	294B Applied Economics Seminar
*186 Math Methods for Economic Analysis	294B Applied Economics Seminar	

\*Note: M.S. students are strongly encouraged to enroll in Econ 186, a pre-fall math 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.

## Economics

### 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 masters 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

Department	Winter		Spring	
Economics	Econ 188: Management in the Global Economy		Econ 211C: PhD Time Series	with permission of instructor
	Econ 209B: Accounting II	Must have prior accounting coursework	Econ 220: PhD Development Economics	with permission of instructor
			Econ 250: PhD Public Economics	with permission of instructor
Applied Mathematics and Statistics	AMS 206: Classical and Bayesian Inference		AMS 207: Intermediate Bayesian Statistical Modeling	
	AMS 206B: Intermediate Bayesian Inference		AMS 245: Spatial Statistics	
	AMS 216: Stochastic Differential Equations		AMS 256: Linear Statistical Models	
Environmental Studies	ENVS 140: National Environmental Policy			
Computer Science	CMPS 101: Algorithms and Abstract Data Types		CMPS 101: Algorithms and Abstract Data Types	
	CMPS 102: Introduction to Analysis of Algorithms		CMPS 102: Introduction to Analysis of Algorithms	
	CMPS 109: Advanced Programming	with permission of instructor	CMPS 109: Advanced Programming	with permission of instructor

## Economics

Department	Winter		Spring	
	CMPS 201: Analysis of Algorithms	with permission of instructor	CMPS 142: Machine Learning and Data Mining	with permission of instructor
	CMPS 211: Combinatorial Algorithms	with permission of instructor	CMPS 182: Introduction to Database Management Systems	
Technology Management	TM 225: Management of Technology	with permission of instructor	TM 207 Random Process Models in Engineering	with permission of instructor
			TM 211 E-Business Technology and Strategy	with permission of instructor
			TM 245 Data Mining	with permission of instructor
			TM 260 Information Retrieval	with permission of instructor

Upon successful completion of these classes, master's students must either pass a comprehensive examination or complete a final paper. The final paper alternative is only available via petition

### PH.D. PROGRAM IN ECONOMICS

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. Graduates of the program have conducted research on a wide variety of topics; examples include international economics, monetary economics, experimental economics, environmental economics, and economic growth and development.

#### Courses and Program Requirements

First-year Ph.D. students are required to take the three sequences: Economics 204A-B-C, Advanced Micro Theory, Economics 205A-B-C, Advanced Macro Theory, and Economics 211A-B-C, Advanced Econometrics. In late June each year, first-year students take two written preliminary exams; one each in Micro and Macro. First-year students must also write an econometrics paper

and submit it to the department by September 30 (beginning) of the second year.

Ph.D. students are required to complete two field sequences, and take 40 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: Economics 240A-B-C, Adv. International Trade, Economics 241A-B-C, Adv. International Finance, Economics 220A-B, Development Economics, Economics 221A-B, Monetary Economics, and Economics 270 or 273, Applied Microeconomics. At the end of their second year, students are required to submit a field paper.

Third-year Ph.D. students must enroll in a workshop focused on advanced topics in their field of interest: Economics 274, Workshop in Macroeconomics; Economics 275, Workshop in Microeconomics; Economics 276, Workshop in Experimental Economics. In addition, students enroll in Economics 295 A-B-C, Directed Reading under their advisor and the Third Year Seminar, Economics 296 A-B-C.

## Economics

In their fourth and fifth years, students are focused on their dissertation research and enroll in either or both Economics 297A-B-C, Independent Study, and/or Economics 298 Dissertation Research.

### Courses and Program Requirements

Year	Fall	Winter	Spring
1st	204A Advanced Micro Theory	204B Advanced Micro Theory	204C Advanced Micro Theory
	205A Advanced Macro Theory	205B Advanced Macro Theory	205C Advanced Macro Theory
	210B Math Methods Econ Analysis	211B Advanced Econometrics	211C Advanced Econometric s
	211A Advanced Econometric s		Micro and Macro Prelim Exams
2nd* *	220A Development Economics: Theory and Cases	220B Development Economics: Theory and Cases	221B Advanced Monetary Economics II
	240A Advanced International Trade	221A Advanced Monetary Economics I	240C Advanced International Trade
	241A Advanced International Finance	240B Advanced International Trade	241C Empirical Applications
	212 Empirical Project	241B Advanced International Finance	Trade and Finance Field Paper
		243* History of International Economy	
3rd	274 Workshop in Macro+	274 Workshop in Macro+	274 Workshop in Macro+
	275 Workshop in Micro+	275 Workshop in Micro+	275 Workshop in Micro+
	276 Workshop in	276 Workshop in Experimental	276 Workshop in

Year	Fall	Winter	Spring
	Experimental Economics+	Economics+	Experimental Economics+
	295A Directed Reading	295B Directed Reading	295C Directed Reading
	296A Third- Year Seminar		
	Qualifying Exam (QE)		
4th	298 Dissertation Research	298 Dissertation Research	298 Dissertation Research
	297A Independent Study	297B Independent Study	297C Independent Study
			Last quarter to challenge QE without academic probation

\*ECON 243 is not required, but Ph.D. students are encouraged to enroll in the course when it is offered.

\*\*Not all field sequences are necessarily offered every year.

+Enrollment in Economics 274, 275, 276 is based on student interest.

Based on university policy, course requirements are satisfied by a letter grade of B or better or a grade of S (satisfactory). A letter grade of C in a course is not satisfactory for meeting a course requirement for the Ph.D. program.

### Preliminary Requirements

Preliminary examinations are given in two parts: one test in micro theory and one test in macro theory. Students are expected to pass both examinations before the beginning of their second year. Preliminary examinations are currently offered in June and September, although scheduling is subject to change.

In the fall quarter of the second year, each student must enroll in Economics 212. An econometrics paper is due September 30 (beginning) of the second year. A field paper is due August 31 (beginning) of the third year of the program. The graduate handbook of the department details the evaluation procedure for the econometrics and the field papers.

Students who do not pass both preliminary examinations, the econometrics paper, and the field

## Economics

paper requirements will not be allowed to continue in the Ph.D. program.

### Qualifying Examination

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Advancement to candidacy for the Ph.D. degree requires completion with satisfactory grades or better of the required coursework, preliminary examinations, the econometrics paper, 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 fall quarter of their third year.

### Dissertation

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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 adviser, 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.

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## ECONOMICS FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**Carlos E. Dobkin**

Public health, public policy, and econometrics

**Robert W. Fairlie**

Labor economics, entrepreneurship, education, applied econometrics

**Daniel Friedman**

Microeconomic theory, experimental/behavioral economics, evolution and learning, financial markets

**K.C. Fung**

International trade and finance, WTO, foreign direct investment, global environmental economics, and Asia/Pacific economies

**Michael M. Hutchison**

International finance, open economy macroeconomics, emerging markets, European and Asian economies

**Kenneth Kletzer**

International economics, macroeconomics, economic development

**Nirvikar Singh**

Industrial organization, political economy, economic development, technology and innovation, South Asian immigrants in the U.S., Indian economy, Sikhs and the Punjab

**Carl E. Walsh**

Monetary theory and policy, macroeconomics

**Donald A. Wittman**

Economic theory, politics, law

### ASSOCIATE PROFESSOR

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**Justin G. Marion**

Public economics, empirical industrial organization

**Jonathan Robinson**

Development economics, program evaluation and applied microeconomics

**Alan Spearot**

International trade; industrial organization, applied econometrics

**Assistant Professor****Eric Aldrich**

Financial econometrics, finance, computational economics and macroeconomics

**George Bulman**

Applied public and labor, economics of education

**Weishi Gu**

Macroeconomics, international economics, labor economics and computational economics

**Natalia Lazzati**

Microeconomic theory, industrial organization, econometrics, experimental economics

**Kristian Lopez-Vargas**

Behavioral economics, experimental economics, microeconomic theory

**Hikaru Saijo**

Macroeconomics, applied econometrics

**Ajay Shenoy**

Development economics, economic growth, macroeconomics, political economy

### LECTURER

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**James Costain**

Macroeconomics, monetary economics, labor markets, game theory

**Julie Hupton Gonzalez**

Environmental economics and policy, natural resource economics and policy, microeconomics, energy economics, managerial economics

## Economics

### **Mallory McWilliams**

Financial accounting, managerial accounting, cost accounting, accounting information systems, advanced accounting and non-profit accounting

### **Kai Pommerenke**

Entrepreneurship and e-commerce; corporate finance, investments, financial engineering, and Chartered Financial Analyst examination

EMERITI

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**Robert F. Adams, Emeritus**

**Joshua Aizenman, Emeritus**

**Yin-Wong Cheung, Emeritus**

**Michael P. Dooley, Emeritus**

**Bernard Elbaum, Emeritus**

**Mary Flannery, Emerita Lecturer**

**Ronald E. Grieson, Emeritus**

**John W. Isbister, Emeritus**

**David E. Kaun, Emeritus**

**Lori G. Kletzer, Emerita**

**Jacob B. Michaelsen, Emeritus**

**Peggy B. Musgrave, Emerita**

**Robert J. Shepherd, Emeritus Senior Lecturer**



**Gregory Laughlin, Professor of Astronomy and Astrophysics**

Extra-solar planets, numerical astrophysics, astrophysical phenomena of the extremely distant future

**Adam Millard-Ball, Assistant Professor of Environmental Studies**

Transportation planning and policy, environmental economics, urban sustainability, climate change policy

**John T. Musacchio, Associate Professor of Information Systems Management**

Control, analysis, and pricing of communications networks; applications of game theory in networking; wireless ad-hoc networks; and management of technology

**Yi Zhang, Associate Professor of Technology and Information Management**

Information retrieval, knowledge management, natural language processing, machine learning

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## ECONOMICS COURSES

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### LOWER-DIVISION COURSES

#### **1. Introductory Microeconomics: Resource Allocation and Market Structure. F,W,S**

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. (General Education Code(s): PE-H, IS.) The Staff

#### **2. Introductory Macroeconomics: Aggregate Economic Activity. F,W,S**

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. (General Education Code(s): PE-H, IS.) The Staff

#### **10A. Economics of Accounting. F,W**

Introduction to accounting principles and practice; preparation and analysis of financial statements; study of internal control procedures. Courses 10A and 10B satisfy the Accounting 1A-B requirement at UC Berkeley. The Staff

#### **10B. Economics of Accounting. W,S**

Managerial accounting emphasizing analysis and control; accounting for corporations; introduction to taxation, budgeting, and equity/debt financing; management decision making. Courses 10A and 10B satisfy the Accounting 1A-B

requirement at UC Berkeley. Prerequisite(s): course 10A. The Staff

#### **11A. Mathematical Methods for Economists I. F,W,S**

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 Mathematics 11A or 19A or Applied Mathematics and Statistics 15A. (Also offered as Applied Mathematics and Statistics 11A. Students cannot receive credit for both courses.) (Also offered as Applied Math and Statistics 11A. Students cannot receive credit for both courses.) Students who have already taken Mathematics 11A or 19A should not take this course. Prerequisite(s): score of 300 or

## Economics

higher on the mathematics placement examination (MPE), Applied Math and Statistics 2, 3, or 6, or Mathematics 3. (General Education Code(s): MF, IN, Q.) The Staff

### **11B. Mathematical Methods for Economists II. F,W,S**

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 Mathematics 11B or 19B or Applied Math and Statistics 15B. (Also offered as Applied Math and Statistics 11B. Students cannot receive credit for both courses.) Prerequisite(s): course 11A, or Applied Mathematics and Statistics 11A, or Mathematics 11A, or Mathematics 19A. (General Education Code(s): MF, IN, Q.) The Staff

### **30. Introduction to Entrepreneurship. S**

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. The Staff

**42. Student-Directed Seminar. \***  
Seminars taught by upper-division students under faculty supervision. (See course 192.) The Staff

### **80A. The Theory, Hope, and Crisis of Capitalism.**

Assessment of modern-day capitalism from the three major economic paradigms-liberal, conservative, radical. Theories of Smith, Marx, and Keynes are explored in contemporary writing, with focus on the U.S. from WW II to present. Students cannot receive credit for this course and course 189. (General Education Code(s): T3-Social Sciences.) D. Kaun  
**80G. Money and the Arts: Two All-Consuming Passions. F**  
Analysis of the performing arts: a commodity providing a rich and varied source of satisfaction, an occupation for thousands of talented and creative individuals, and an activity whose funding (public versus private) is the source of significant controversy. Students cannot receive credit for this course and course 137. (General Education Code(s): T3-Social Sciences.) D. Kaun

### **80H. Wall Street and the Money Game. \***

Provides a demystifying introduction to financial markets. Examines the theory of stock market investment, the workings of the international money market, the implications of corporate takeovers, and the regulation of the economy by the Federal Reserve Board. (General Education Code(s): T3-Social Sciences.) The Staff

### **93. Field Study. F,W,S**

Supervised fieldwork experience, off campus, in an area connected with economics or business. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **93F. Field Study (2 credits). F,W,S**

Supervised off-campus fieldwork experience in an area connected

with economics or business. Prerequisite(s): permission of instructor; students submit petition to sponsoring agency. The Staff

### **99. Tutorial. F,W,S**

May be repeated for credit. The Staff

## UPPER-DIVISION COURSES

### **100A. Intermediate Microeconomics. F,W,S**

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(s): courses 1; 2; and 11B or Applied Mathematics and Statistics 11B or Mathematics 22 or 23A. The Staff

### **100B. Intermediate Macroeconomics. F,W,S**

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(s): courses 1; 2; and 11B or Applied Mathematics and Statistics 11B or Mathematics 22 or 23A. The Staff

### **100M. Intermediate Microeconomics, Math Intensive. \***

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

## Economics

and course 100A. Prerequisite(s): courses 1; 2; and 11B or Applied Mathematics and Statistics 11B, or Mathematics 22 or 23A. The Staff

### **100N. Intermediate Macroeconomics, Math Intensive.**

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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(s): courses 1; 2; and 11B or Applied Mathematics and Statistics 11B, or Mathematics 22 or 23A. The Staff

### **101. Managerial Economics. W**

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(s): courses 100A or 100M, and 113. The Staff

### **104. Is There Truth in Numbers: The Role of Statistics in Economics. W,S**

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(s): courses 100A or 100M, and 113, and Entry Level Writing and Composition requirements. The Staff

### **105. Topics in Macroeconomic Theory. F**

A seminar in advanced macroeconomics focusing on a selection of theoretical issues. Emphasis is on detailed modeling and analysis of macroeconomic processes. Prerequisite(s): course 100B or 100N, and 113. The Staff

### **110. Managerial Cost Accounting and Control. S**

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(s): course 10B. The Staff

### **111A. Intermediate Accounting I. F**

Principles, control, and theory of accounting for assets; accounting as an information system; measurement and determination of income. Projects involving spreadsheet software required. Students cannot receive credit for this course and course 209A. Prerequisite(s): course 10B. The Staff

### **111B. Intermediate Accounting II. W**

Principles, control, and theory of accounting for liabilities and equities; preparation and analysis of cash flow statements and earnings per share computation. Projects involving spreadsheet software required. Students cannot receive credit for this course and course 209B. Prerequisite(s): course 10B. The Staff

### **112. Auditing and Attestation. W**

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(s): course 10B. The Staff

### **113. Introduction to Econometrics. F,W,S**

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. Students cannot receive credit for this course and Applied Mathematics and Statistics 113. Prerequisite(s): courses 1 and 2; Applied Mathematics and Statistics 5 or 7; and one of the following: course 11B, Applied Mathematics and Statistics 11B, Mathematics 22, or Mathematics 23A. Courses 100A or 100B strongly recommended as preparation. (General Education Code(s): SR, Q.) The Staff

### **114. Advanced Quantitative Methods. W**

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

## Economics

discussion of existing empirical work and econometric projects by students. Prerequisite(s): courses 100A or 100M, and 113. The Staff

### **115. Introduction to Management Sciences. W**

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(s): course 100A or 100M. The Staff

### **116. Advanced Topics in Accounting and Ethics. S**

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(s): courses 10A, 10B, 111A, and 111B. Enrollment is restricted to economics, business management economics, global economics, and the combined economics and environmental studies and mathematics majors. K. Erin

### **117A. Income Tax Factors for Individuals. W**

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(s): course 10B. The Staff

### **117B. Tax Factors of Business and Investment. F**

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. (Formerly course 117.) Prerequisite(s): course 10B. The Staff

### **119. Advanced Accounting. S**

Accounting for business organizations; partnerships; government and non-profit organization funds; branches, consolidations, and installment sales. Projects involving spreadsheet software required. Prerequisite(s): courses 111A and 111B. The Staff

### **120. Economic Development. W**

A comparative approach to the study of the economic development of low-income countries. Various obstacles to growth are identified, and different types of solutions are analyzed. Prerequisite(s): courses 1, 2, and 113. (General Education Code(s): E.) The Staff

### **121. Economic Growth. F,S**

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(s): courses 1, 2, 11A, and 11B (or the equivalent); course 100B is strongly recommended. The Staff

### **125. Economic History of the U.S. S**

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(s): courses 1 and 2. Related coursework in history also helpful. Enrollment restricted to juniors and seniors. The Staff

### **126. Why Economies Succeed or Fail: Lessons from Western and Japanese History. F**

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(s): courses 1 and 2. Related coursework in history also helpful. Enrollment restricted to juniors and seniors. The Staff

### **128. Poverty and Public Policy. S**

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. (Also offered as Legal Studies 128. Students cannot receive credit for both courses.)

## Economics

Prerequisite(s): courses 100A or 100M; and course 113. Enrollment restricted to economics, business management economics, global economics, legal studies, or economics combined majors. (General Education Code(s): E.) The Staff

### **130. Money and Banking. W**

The institutional structure of central banking and of bank and nonbank financial intermediation in the U.S.; theoretical and empirical investigations of the role of monetary policy in macroeconomic stabilization and economic growth. Prerequisite(s): courses 100B or 100N, and 113. The Staff

### **131. International Financial Markets. S**

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(s): courses 100A or 100M, and 100B or 100N. The Staff

### **133. Security Markets and Financial Institutions. F,S**

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(s): courses 100A or 100M, and 113. The Staff

### **135. Corporate Finance. W**

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(s): courses 10A, 100A or 100M, and 113. The Staff

### **136. Business Strategy. S**

The strategic management process, techniques for analyzing single-business and diversified companies, implementing strategy, organization, business planning, financial strategy, competitive analysis, entrepreneurial skills. Prerequisite(s): courses 10A and either 100A or 100M. Concurrent enrollment in course 136L is not required. The Staff

### **137. Performing Arts in the Public and Private Economy. F**

Analysis of the performing arts: a commodity satisfying a rich and varied source of satisfaction, an occupation for thousands of talented and creative individuals, and an activity whose funding (public versus private) is the source of significant controversy. Economics 1 is strongly recommended as a preparation. Students cannot receive credit for this course and course 80G. D. Kaun

### **138. The Economics and Management of Technology and Innovation. F**

Examines the analytics of issues in technology and innovation, including cooperation in research and development (R&D), standardization and compatibility, patents and intellectual property rights, and strategic management, using economic models and firm case studies. Prerequisite(s): course 100A or 100M, or permission of instructor. The Staff

### **139A. The Economics of Electronic Commerce. S**

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(s): course 100A or 100M, or permission of instructor. The Staff

### **139B. E-Commerce Strategy. \***

Introduction and review of economic principles for e-commerce. Overview of trends in e-commerce. Online retailing of physical products; digital products; financial services; housing and related markets. Online business-to-business transactions. Internet infrastructure industry. Government regulation of e-commerce and business strategy responses. Prerequisite(s): course 139A. The Staff

### **140. International Trade. F**

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(s): course 100A or 100M. The Staff

### **141. International Finance. S**

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(s): course 100B or 100N. The Staff

### **142. Advanced Topics in International Economics. \***

Selected issues in contemporary international economics: theory,

## Economics

empirical evidence, and public policy. Seminar emphasizing discussion and individual research. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, courses 100A or 100M, and 100B or 100N, and 140 or 141. (General Education Code(s): W.) The Staff

### **143. Policy Issues in the International Economy. W**

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(s): courses 1, 2, and 100A or 100M. The Staff

### **148. Latin American Economies. \***

This course is designed to familiarize students with the economic and business environment in Latin America. Prerequisite(s): courses 1 and 2. The Staff

### **149. The Economies of East and Southeast Asia. W**

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(s): courses 1 and 2. The Staff

### **150. Public Finance. F**

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(s): course 100A or 100M, and course 100B or 100N. The Staff

### **156. Health Care and Medical Economics. \***

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(s): courses 100A or 100M and 113. The Staff

### **159. The Economics of Organizations. \***

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(s): course 100A or 100M. The Staff

### **160A. Industrial Organization. S**

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. (Also offered as Legal Studies 160A. Students cannot receive credit for both courses.) Prerequisite(s): course 100A or 100M. The Staff

### **160B. Government and Industry. \***

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 redistribution. Prerequisite(s): course 100A or 100M. The Staff

### **161A. Marketing. F,S**

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. (Formerly course 161.) Prerequisite(s): course 100A or 100M. The Staff

### **161B. Marketing Research. W**

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(s): courses 113 and 161A. The Staff

### **162. Legal Environment of Business. W**

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. (Also offered as Legal Studies 162. Students cannot receive credit for both courses.)

## Economics

Prerequisite(s): course 100A or 100M. The Staff

### **164. Economics and the Telecommunications Industry. \***

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(s): courses 100A or 100M, and 113. The Staff

### **165. Economics as an Experimental Science. \***

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(s): course 100A or 100M, and course 113. Enrollment limited to 40. (General Education Code(s): W.) The Staff

### **166A. Game Theory and Applications I. F**

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. (Also offered as Technology & Info Management 166A. Students cannot receive credit for both courses.) Prerequisite(s): Applied Math and Statistics 5 or 7 or Economics 113;

and Economics 11B, Applied Math and Statistics 11B, or Mathematics 11B or 19B. Enrollment restricted to juniors and seniors. Enrollment limited to 100. The Staff

### **166B. Game Theory and Applications II. W**

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 Economics 272, Computer Science 272, or Biology: Ecology and Evolutionary 274. (Also offered as Computer Science 166B. Students cannot receive credit for both courses.) Prerequisite(s): course 166A or Computer Science 166A; satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to juniors and seniors. Enrollment limited to 40. (General Education Code(s): W.) The Staff

### **169. Economic Analysis of the Law. S**

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. (Also offered as Legal Studies 169. Students cannot receive credit for both courses.) Prerequisite(s): course 100A or 100M or permission of instructor. The Staff

**170. Environmental Economics. \*** 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(s): course 100A or 100M. The Staff

### **171. Natural Resource Economics. F**

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(s): course 100A or 100M. The Staff

### **175. Energy Economics. S**

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(s): course 100A or 100M. The Staff

### **180. Labor Economics. S**

A study of the changing nature and composition of the U.S. labor force. Topics include the demand for and supply of labor; wage determination; the role and impact of unions in the labor market; racial, ethnic, and gender differences in job and income opportunities and the role of discrimination in explaining these differences; and the theory of human capital, all considered from the traditional neoclassical as well as institutional and radical perspectives. Prerequisite(s): course 100A or 100M. Course 113 is strongly recommended as preparation. The Staff

## Economics

### **183. Women in the Economy. S**

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. (Also offered as Legal Studies 183. Students cannot receive credit for both courses.) Prerequisite(s): course 100A or 100M; course 113 is strongly recommended. The Staff

### **184. Labor Wars in Theory and Film. W**

This seminar focuses on the impact of trade unions and labor-market discrimination on the U.S. work force. The neo-classical, institutional, and radical/Marxist approaches to these questions are employed in the analysis. Films, both fictional and documentary, are utilized as primary source material. Prerequisite(s): permission of instructor based on quality of work in economics; courses 100A or 100M, 100B or 100N, and 113; satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 20. (General Education Code(s): W.) D. Kaun

### **186. Mathematical Methods for Economic Analysis. F**

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(s): interview only: enrollment restricted to students admitted to the APEF M.S. Program. The Staff

### **188. Management in the Global Economy. W**

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(s): course 113 and either course 100A or 100M. The Staff

### **189. Political Economy of Capitalism. W**

An assessment of modern day capitalism from the three major economics paradigms-liberal, conservative, radical. Theories of Smith, Marx, and Keynes are explored in contemporary writing, with focus on the U.S. from WW II to present. Students cannot receive credit for this course and course 80A. Prerequisite(s): courses 1 and 2; courses 100A or 100M, and 100B or 100N are recommended as preparation. D. Kaun

### **190. Senior Proseminar. \***

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. The Staff

### **191. Economics Teaching Practicum. F,W,S**

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. The Staff

### **192. Directed Student Teaching. F,W,S**

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. The Staff

### **193. Field Study. F,W,S**

Provides for department-sponsored individual field study in the vicinity of the campus under the direct supervision of a faculty sponsor (in contrast to course 198 where faculty supervision is by correspondence). May not be counted toward the upper-division major requirements. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **193F. Field Study (2 credits). F,W,S**

Provides for department-sponsored individual field study in the vicinity of the campus under the direct supervision of a faculty sponsor. May not be counted toward the upper-division major requirements. Students spend 8-10 hours per week at job site. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **194. Advanced Topics in Management. \***

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 course 194F. Prerequisite(s): courses 100A or 100M, 100B or 100N, and 113. Enrollment by permission of instructor, and review of performance in economics courses. Enrollment

## Economics

restricted to senior and junior business management economics majors. (Formerly Advanced Topics in Business Management Economics.) Enrollment limited to 30. The Staff

### **194F. Advanced Topics in Management (2 credits). \***

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 course 194F. Prerequisite(s): courses 100A or 100M, 100B or 100N, and 113. Enrollment by permission of instructor, and review of performance in economics courses. Enrollment restricted to senior and junior business management economics majors. Enrollment limited to 30. The Staff

### **195. Senior Thesis. F,W,S**

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. (General Education Code(s): W.) The Staff

### **197. Economic Rhetoric: Using Economic Theory and Empirical Evidence in Arguing Policy. F,W,S**

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(s): Entry Level Writing & Composition requirement; one of the following courses:

100A, 100M, 100B, 100N, or 113.

Restricted to

sophomore, junior, senior economics, business-management economics, global economics and combined economics/math majors. The Staff

### **198. Independent Field Study.**

**F,W,S**

Provides for department-sponsored individual study program off campus for which faculty supervision is not in-person, but by correspondence. May not be counted toward the upper-division major requirements. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **198F. Independent Field Study (2 credits). F,W,S**

Provides for department-sponsored individual study program off campus for which faculty supervision is not in person, but by correspondence. May not be counted toward the upper-division major requirements. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

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 199. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S** Specialized study with individual faculty. May not be applied toward the major requirements. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## GRADUATE COURSES

### **200. Microeconomic Analysis. F**

Survey of partial equilibrium analysis, market distortions, consumer choice and production and trade theory, perfect and imperfect competition, price discrimination, and intertemporal choice theory. Enrollment restricted to applied economics and finance graduate students. The Staff

### **201. Applications in Microeconomics. S**

Applies concepts and tools developed in course 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. Course 200 is strongly recommended as preparation. Enrollment restricted to applied economics and finance graduate students. The Staff

### **202. Macroeconomic Analysis. F**

Aggregate economic analysis: determinants of aggregate expenditures and output, the roles of monetary and fiscal policy, recent developments in macro theory; macro policy issues. Enrollment restricted to applied economics and finance graduate students. The Staff

## Economics

### **204A. Advanced Microeconomic Theory. F**

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. Illustrative examples emphasize international applications. Courses must be taken in sequence. Enrollment restricted to graduate students or by permission of instructor. The Staff

### **204B. Advanced Microeconomic Theory. W**

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. Illustrative examples emphasize international applications. Courses must be taken in sequence. Prerequisite(s): course 204A. The Staff

### **204C. Advanced Microeconomic Theory. S**

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. Illustrative

examples emphasize international applications. Courses must be taken in sequence. Prerequisite(s): course 204B. The Staff

### **205A. Advanced Macroeconomic Theory. F**

Modern macroeconomic theory: determination of national income; employment, inflation, and exchange rates; theories of growth and business cycle fluctuations; international transmission of inflation and other disturbances; recent developments in the analysis of macroeconomic policy; modern theoretical and empirical analysis of aggregate relationships. Courses must be taken in sequence. Enrollment restricted to graduate students or by permission of instructor. The Staff

### **205B. Advanced Macroeconomic Theory. W**

Modern macroeconomic theory: determination of national income; employment, inflation, and exchange rates; theories of growth and business cycle fluctuations; international transmission of inflation and other disturbances; recent developments in the analysis of macroeconomic policy; modern theoretical and empirical analysis of aggregate relationships. Courses must be taken in sequence. Prerequisite(s): course 205A. The Staff

### **205C. Advanced Macroeconomic Theory. S**

Modern macroeconomic theory: determination of national income; employment, inflation, and exchange rates; theories of growth and business cycle fluctuations; international transmission of inflation and other disturbances; recent developments in the analysis of macroeconomic policy; modern theoretical and empirical analysis of aggregate relationships. Courses

must be taken in sequence. Prerequisite(s): course 205B. The Staff

### **209A. Accounting 1. \***

Principles, control, and theory of accounting for assets; accounting as an information system; measurement and determination of income. M.S. level projects required. Students cannot receive credit for this course and course 111A. Enrollment restricted to graduate students. The Staff

### **209B. Accounting II. W**

Principles, control, and theory of accounting for liabilities and equities; preparation and analysis of cash flow statements and earnings per share computation. M.S. level projects required. Students cannot receive credit for this course and course 111B. Enrollment restricted to graduate students. The Staff

### **210A. Mathematical Methods for Economic Analysis. \***

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. The Staff

### **210B. Mathematical Methods for Economic Analysis. F**

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. Course 210A or equivalent is strongly recommended as preparation. The Staff

## Economics

### **211A. Advanced Econometrics. F**

Advanced econometric methods are introduced. Topics include the standard regression analysis, simultaneous equation estimation, nonlinear models, qualitative response models, panel data analysis, and univariate and multivariate time series analysis. Enrollment restricted to graduate students or by permission of instructor. The Staff

### **211B. Advanced Econometrics. W**

Advanced econometric methods are introduced. Topics include the standard regression analysis, simultaneous equation estimation, nonlinear models, qualitative response models, panel data analysis, and univariate and multivariate time series analysis. Course 211A is strongly recommended as preparation for course 211B. The Staff

### **211C. Topics in Empirical Research. S**

A topic course in econometrics designed for graduate students interested in quantitative analysis. Selected topics, including standard and recently developed econometric techniques, are critically and thoroughly discussed. In addition to methodology, focuses on exploring the research potential and applications of advanced econometric techniques. Courses 211A and 211B are strongly recommended as preparation. The Staff

### **212. Empirical Project in Econometrics (2 credits). \***

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): courses 211A and 211B. May be repeated for credit. The Staff

### **216. Applied Econometric Analysis I. F**

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. Enrollment restricted to applied economics and finance graduate students. The Staff

### **217. Applied Econometric Analysis II. W**

Focuses on the application of advanced econometric and time series techniques to economic issues. Computer assignments and empirical applications are used to discuss and illustrate the practical aspects of simultaneous equation systems, nonlinear models, qualitative response models, time series model specification, unit root test, and cointegration analysis. Course 216 is strongly recommended as preparation. Enrollment restricted to applied economics and finance graduate students. The Staff

### **220A. Development Economics: Theory and Cases. W**

Surveys traditional development economics and the neoclassical resurgence in development theory. Topics include sources of growth, income distribution, population and human capital development, savings, fiscal and monetary mobilization and allocation, foreign investment and aid, and macroeconomic policies. Case study focus in the second quarter. Courses 204A and 205A are strongly recommended as preparation. The Staff

### **220B. Development Economics: Theory and Cases. S**

Surveys traditional development economics and the neoclassical resurgence in development theory. Topics include sources of growth, income distribution, population and human capital development, savings, fiscal and monetary mobilization and allocation, foreign investment and aid, and macroeconomic policies. Case study focus in the second quarter. Courses 204A and 205A are strongly recommended as preparation. The Staff

### **221A. Advanced Monetary Economics I. \***

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 economies; 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(s): course 205 A-B-C, or by permission of instructor. Enrollment restricted to graduate students. The Staff

### **221B. Advanced Monetary Economics II. S**

Covers major issues in monetary economics, focusing on the core lessons for design and implementation of monetary policies. Topics include: welfare-based policy objectives; optimal policy under discretion; optimal commitment policies; model dynamic stochastic general equilibrium (DSGE) for policy analysis; open economy models for

## Economics

monetary policy analysis; learning; model uncertainty and policy design; empirical evidence on the channels of monetary policy transmission; monetary policy operating procedures; zero nominal interest-rate bound; international transmission of monetary policy; policy and asset prices.

Prerequisite(s): course 205 A-B-C, or by permission of instructor. Enrollment restricted to graduate students. The Staff

### **233. Finance I. W**

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. Course 200 is strongly recommended as preparation. Enrollment restricted to applied economics and finance graduate students. The Staff

### **234. Financial Institutions and Markets. \***

This course examines the evolving microstructure of financial markets, instruments, and institutions. Topics include the role of banks and other financial intermediaries and the trading practices for domestic and international financial instruments, including equity, debts, futures, and options. Prerequisite(s): course 233. The Staff

### **235. Corporate Finance. \***

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(s): course 233. The Staff

### **236. Financial Engineering. S**

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(s): course 233. Enrollment restricted to applied economics and finance graduate students. The Staff

### **239. Current Topics in Finance. \***

Topics in finance selected by the instructor. Prerequisite(s): course 233. The Staff

### **240A. Advanced International Trade Theory I. F**

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. Enrollment restricted to graduate students. Courses 204A-B-C are strongly recommended as preparation. The Staff

### **240B. Advanced International Trade Theory II. \***

This is the second quarter of a two-quarter sequence. It deals with most major current advanced research topics in trade. It is both theoretical and empirical and is designed to acquaint students with recent research in the field. Research topics include models of political economy of trade policies; trade and labor markets; regionalism and multilateralism;

trade and environment; theories, determinants, and implications of foreign direct investments; economic geography.

Prerequisite(s): course 240A. The Staff

### **240C. Advanced International Trade Theory III. \***

Covers the empirical aspects of international trade issues. Topics include the testing and estimation of various trade models such as the Ricardian model, Heckscher-Ohlin-Vanek model, intra-industry trade models, trade models associated with multinational corporations, models of trade and intellectual property rights, the impact of trade on income inequality, and trade between developed and developing economies. Prerequisite(s): course 240B. Enrollment restricted to graduate students. The Staff

### **241A. Advanced International Finance I. F**

Financial aspects of aggregate capital and trade flows and income determination in open economies. Specific topics include financial risk in the international setting, international borrowing and lending, money and exchange rate regimes, income determination and macroeconomic policy, current issues in international monetary reform. The Staff

### **241B. Advanced International Finance II. W**

An examination of the formulation and implementation of international economic policy from both theoretical and empirical perspectives. Topics include case studies in fiscal, monetary, exchange rate, tariff, and other regulatory policies. The Staff

**241C. Advanced International Finance III. \***

Focuses on empirical applications in international finance. Topics include structural and reduced form models of exchange rates, interest parity conditions, purchasing power parity, capital controls, capital flows to emerging markets, and government intervention in foreign exchange markets. Courses 202 and 203 or 205A-B-C strongly recommended as preparation. The Staff

**243. History of the International Economy. \***

Studies the evolution and functioning of the international economy from the days of the gold standard to the present. Particular attention is paid to the interwar period with its problems of structural transformations and their relation to the Great Depression and its immediate aftermath, the rise and fall of the Bretton Woods system, the experience of floating exchange rate regimes, the rise of the "new industrial countries," and the problems of international indebtedness. Courses 204A and 205A are strongly recommended as preparation. The Staff

**249A. International Trade and Development Policy I. \***

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. Enrollment restricted to graduate students. The Staff

**249B. International Trade and Development Policy II. \***

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(s): course 249A. Enrollment restricted to graduate students. The Staff

**250. Advanced Public Finance. S**

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. Courses 204A and 205A are strongly recommended as preparation. Students cannot receive credit for this course and course 150. The Staff

**259A. Cost-Benefit Analysis. \***

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. The Staff

**259B. Public Policy Analysis. \***

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. The Staff

**270. Advanced Topics in Applied Microeconomics. \***

Advanced topics and current research in microeconomic theory, including game theory and general equilibrium analysis. Courses 204A-B and 205A are strongly recommended as preparation. (Formerly Advanced Topics in Microeconomic Theory.) The Staff

**271. Advanced Topics in Macroeconomic Theory. F**

Advanced topics and current research in macroeconomic theory, including DSGE models, empirical issues, and optimal policy analysis. Prerequisite(s): courses 204A-B-C, 205A-B-C, and 211A-B-C are strongly recommended as preparation. The Staff

**272. Evolutionary Game Theory. W**

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 Economics 166B or Computer Science 166B. (Also offered as Computer Science 272. Students cannot receive credit for both courses.) The Staff

**273. Advanced Applied Microeconomics. F**

Covers topics in applied microeconomics, including labor economics, public economics, and demography. Discusses advanced econometric techniques and theory commonly used in applied microeconomics and microeconomic theory. Students

## Economics

make extensive use of statistical packages and large data sets to complete course assignments. Upper-division econometric and microeconomics courses strongly recommended. The Staff

### **274. Workshop in Macroeconomics and Monetary Economics (3 credits). F,W,S**

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(s): courses 205A, 205B, and 205C, or by consent of instructor. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **275. Workshop in Applied Microeconomics (3 credits). F,W,S**

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. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **276. Workshop in Experimental Economics (3 credits). F,W,S**

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 by permission of instructor. May be repeated for credit. D. Friedman

### **290. Topics in International Economics. \***

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-B-C and 205A-B-C are strongly recommended as preparation. The Staff

### **291. Workshop in Applied Economics. \***

Experience in applied projects, report writing and presentation, drawing on previous coursework. The Staff

### **293. Field Study. F,W,S**

Students will undertake analytical projects in public or private institutions. The material covered must be different from that of the thesis topic. The Staff

### **294A. Applied Economics and Finance Laboratory (2 credits). F,W**

Practical experience in managing computerized data sets and running statistical packages. Covers STATA and R. (Formerly Applied Economics Laboratory.) Enrollment is restricted to applied economics and and finance graduate students. May be repeated for credit. The Staff

### **294B. Applied Economics and Finance Seminar (2 credits). W,S**

Bi-weekly seminars designed to present students with current working applications in various fields of applied economics and finance. (Formerly Applied Economics Seminar.) Enrollment is restricted to applied economics and and finance graduate students. May

be repeated for credit. The Staff

### **294C. Economics Guest Seminar Series (1 credit). \***

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. Enrollment restricted to graduate students. The Staff

### **294D. Applied Economics Seminar (2 credits). F,W,S**

Weekly seminar designed to present students with current working applications in various fields of applied economics. Enrollment is restricted to economics Ph.D. students. The Staff

### **295A. Directed Reading. F**

Reading in research area of student interest, with faculty supervision through weekly discussion. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **295B. Directed Reading. W**

Reading in research area of student interest, with faculty supervision through weekly discussion. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **295C. Directed Reading. S**

Reading in research area of student interest, with faculty supervision through weekly discussion. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **296A. Third Year Ph.D. Seminar. F**

Student presentations of literature and/or original research in areas of student research interest. Student discussion of presentations under faculty supervision. Prerequisite(s): courses 204C, 205C, 211B, 240A, 240B, 241A, and 241B are required preparation. The Staff

Economics

**296B. Third Year Ph.D. Seminar. \***

Student presentations of literature and/or original research in areas of student research interest. Student discussion of presentations under faculty supervision. Prerequisite(s): courses 204C, 205C, 211B, 240A, 240B, 241A, and 241B are required preparation. The Staff

**296C. Third Year Ph.D. Seminar. \***

Student presentations of literature and/or original research in areas of student research interest. Student discussion of presentations under faculty supervision. Prerequisite(s): courses 204C, 205C, 211B, 240A, 240B, 241A, and 241B are required preparation. The Staff

**297. Independent Study. F,W,S**

Independent study and research under faculty supervision. Students submit petition to sponsoring agency. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# EDUCATION

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2015-16 General Catalog

McHenry Library

Advising: (831) 459-3249

[education@lists.ucsc.edu](mailto:education@lists.ucsc.edu)

<http://education.ucsc.edu>

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## PROGRAM DESCRIPTION

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The purpose of the Education Department's instructional programs is to prepare all students, undergraduates and graduates, to engage in the analysis and integration of educational theory, research, and practice for an increasingly diverse society. The department's primary intellectual and practical focus is on fostering equitable and effective schooling for all students. In working toward this goal, the department seeks to understand the profound issues involved in transforming public education so that it better meets the needs of students from diverse language, ethnic, racial, and class backgrounds. We are a small department with the large agenda of developing educational leaders and pursuing educational research that will affect the future of teaching and learning both inside and outside of schools. Our commitment lies in three essential and interrelated domains: 1) school, families, and communities; 2) teacher education and development; and 3) mathematics and science education. Undergirding them all is a focus on the socio-cultural context in which learning and teaching takes place and an understanding of the power of language and literacy in both formal and informal educational settings.

The Education Department has an active doctor of philosophy (Ph.D.) program that attracts students who have exemplary academic preparation as well as experience working in educational settings. Our doctor of education (Ed.D.) program is currently not accepting new students. We have a model teacher-education program; and two vibrant minor tracks that serve more than 300 undergraduates each year.

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### MINORS IN EDUCATION

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The UCSC undergraduate courses in education engage students in the study of the history of educational thought and philosophy, the politics and economics of education, learning theory and pedagogy, and issues of cultural and linguistic diversity in education.

Because an academic major in education is not permitted in the state of California, UCSC offers two

minors in education for those students who are considering a career in teaching and also for those who hold a general interest in educational studies. Please note that the minors in education do not provide a California Teaching Credential. Additionally, the UCSC teaching credential program is a graduate program and coursework taken in the minor cannot be substituted for credential requirements.

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### GENERAL MINOR IN EDUCATION

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The general minor in education consists of six courses totaling 30 credits:

- Education 60, Introduction to Education
- Education 180, Introduction to Teaching
- Four upper-division education courses (courses number Education 102-189). (Please refer to the [Education Department's web site](#) for a list of approved upper-division courses being offered during the current academic year.
- Declared minors have priority enrollment for upper-division education courses. Upper-division electives may be taken before Education 180.

To be eligible to declare the general minor in education, students must have:

- Completed or be enrolled in Education 60, Introduction to Education
- Successfully declared a major.

To officially declare a general minor in education, students must bring from their major department a completed Petition for Major/Minor Declaration and UCSC Academic Planning Form to the Education Department's undergraduate adviser. Students pursuing a minor in education should meet with the Education Department's undergraduate adviser as early as possible. The adviser will assist students in completing the Petition for a Major/Minor Declaration and the UCSC Academic Planning Form.

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## FOR FURTHER INFORMATION

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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 web site <http://education.ucsc.edu>. For other inquiries, please contact the undergraduate adviser by sending an e-mail to [education@ucsc.edu](mailto:education@ucsc.edu).

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## SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS (STEM) EDUCATION MINOR

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The STEM minor specifically serves students in STEM majors who are considering careers in secondary mathematics or science teaching. The STEM minor in education consists of eight courses, totaling 32 credits and including 90-100 hours of classroom field placements:

EDUC 50 (A, B or C, Introduction to Teaching, Cal Teach 1 (2 credits)

EDUC 60, Introduction to Education

EDUC 100 (A, B or C), Science and Mathematics, Cal Teach 2 (2 credits)

EDUC 185B, Introduction to Mathematics Education, or 185C, Introduction to Teaching Science

EDUC 185L, Introduction to Teaching: Cal Teach 3

One upper-division education course addressing cultural and linguistic diversity (e.g., EDUC 128, 135, 141, 164, 170, 177, or 181),

Two upper-division education courses (courses number EDUC 102-189). Please refer to the Education Department's web site for a list of approved upper-division courses being offered during the current academic year, <http://education.ucsc.edu>).

Students pursuing the STEM education minor should meet with the Cal Teach staff as early as possible. Entry into EDUC 50 is by interview only, and interested students must submit an application to the Cal Teach program (see <http://calteach.ucsc.edu> or e-mail [calteach@ucsc.edu](mailto:calteach@ucsc.edu)).

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## GRADUATE PROGRAMS

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### MASTER OF ARTS IN EDUCATION AND CALIFORNIA TEACHER CREDENTIAL PROGRAM

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The Master of Arts (M.A.) in education and California teacher credential program prepare 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 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.

Students who complete the program are eligible to apply for a California Preliminary Multiple Subjects Teaching Credential or a California Preliminary Single Subject Teaching Credential. The Multiple Subjects Teaching Credential authorizes the holder to teach in a K-6, 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. Please note that students are not admitted into the program for a stand-alone Master of Arts in education or a stand-alone credential. Additionally, holders of a previously issued California or out-of-state credential are not eligible for admission to the program.

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.

### MASTER OF ARTS IN EDUCATION AND PRELIMINARY CREDENTIAL IN SECONDARY SCIENCE IN SILICON VALLEY (CURRENTLY NOT ACCEPTING NEW STUDENTS)

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The Silicon Valley Master of Arts in education and preliminary secondary science credential has the same degree requirements as the campus-based program. The program's course work is offered at UCSC and UCSC Extension in Santa Clara with student teaching placements in middle and high schools in the greater San Jose area. Program details are available at web site <http://education.ucsc.edu/macsv/>.

## PROGRAM LEARNING OUTCOMES

<b>Table 1. M.A./Credential Program Learning Outcomes for Multiple Subject Candidates and Single Subject Candidates</b>	
<b>Making Subject Matter Comprehensible to Students</b>	
Program Learning Outcome (PLO) 1	Specific Pedagogical Skills for Subject Matter Instruction
<b>Assessing Student Learning</b>	
PLO 2	Monitoring Student Learning During Instruction
PLO 3	Interpretation and Use of Assessments
<b>Engaging and Supporting Students in Learning</b>	
PLO 4	Making Content Accessible
PLO 5	Student Engagement
PLO 6	Developmentally Appropriate Teaching Practices
PLO 7	Teaching English Learners
<b>Planning Instruction and Designing Learning Experiences for Students</b>	
PLO 8	Learning About Students
PLO 9	Instructional Planning
<b>Creating and Maintaining Effective Environments for Student Learning</b>	
PLO 10	Instructional Time
PLO 11	Social Environment
<b>Developing as a Professional Educator</b>	
PLO 12	Professional, Legal, and Ethical Obligations
PLO 13	Professional Growth
PLO 14	Integrating Pedagogical Theory, Research, and Practice

### 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 UCSC undergraduate education courses are examples of courses that meet this requirement: 128, Immigrants and Education; 141, Bilingualism and Schooling; 164, Urban Education; 181, Race, Class, and Culture in Education; and 92C Introduction to Issues in Diversity and Education. Other courses offered outside the Education Department may be acceptable, however,

outside coursework cannot be preapproved, it should be included with the application and a description included in the Statement of Purpose as to how it addressed these topics.

A documented field experience with children or youth in an educational setting at the same 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 or narrative evaluations. The appropriateness of courses taken for the credential sought is also taken into consideration. For the multiple subjects credential, students should have an extensive breadth of courses in the core subject areas taught in elementary school—math, 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.

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 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

## Education

### Letters of Recommendation:

- three letters of recommendation are required
- at least one letter should be written by university faculty who can address the applicant's academic merit, and at least one letter written from someone in the field who has observed the applicant's work with children or youth
- it is recommended that these letters are current and address your qualifications in the following areas:
  - academic performance
  - 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

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## ADMISSION REQUIREMENTS

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### TESTING

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All required examinations must be met by the stated deadlines.

All admitted applicants must verify completion of the California Basic Educational Skills Test (CBEST) requirement and submit a passing-status verification by June 1 in order to enroll in the program.

Additional information can be found at the California Educator Credential Examination web site, <http://www.cset.nesinc.com/> (state requirement and subject to change). It is recommended that passing verification be submitted with the application.

### SUBJECT-MATTER COMPETENCE

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California state law mandates that all teachers provide evidence of their subject-matter knowledge (state requirement and subject to change).

Admitted Multiple Subject applicants must submit verification of having passed the California Subject Examinations for Teachers (CSET): Multiple Subjects Subtests by June 1 prior to enrollment in the program. However, it is highly recommended that documentation of passing CSET scores be submitted with the application. Multiple Subject applicants must pass each section of the CSET; no coursework or "waiver" program can substitute for passing CSET scores.

Deadline to complete this requirement: June 1 of each year prior to enrollment into the program. However, applicants are encouraged to complete this requirement prior to applying to the program.

Additional information can be found at the CSET Registration web site, <http://www.cset.nesinc.com/>.

### SINGLE SUBJECT

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The California Subject Examinations for Teachers (CSET), or verification of an approved subject matter program from the applicant's undergraduate institution is required. Admitted applicants must submit verification of having passed the CSET examination for their subject (e.g., mathematics), or confirmation of 100 percent completion of an approved subject matter program.

Deadline to complete this requirement: June 1 of each year prior to enrollment into the program. However, it is highly recommended that documentation of subject matter competence be submitted with the application. Additional information can be found at the CSET Registration web site, <http://www.cset.nesinc.com/>.

### CERTIFICATE OF CLEARANCE

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In accordance with Education Code Section 44320(b), each credential candidate for an initial credential, prior to admission to any credential program, must have their fingerprints cleared by the Federal Bureau of Investigations and the California Department of Justice and obtain a Certificate of Clearance from the California Commission on Teacher Credentialing.

To comply with this regulation, the UCSC Education Department requires all applicants to provide evidence of obtaining their clearance as part of their application for admission to the credential program. Applicants are required to upload a copy of their Certificate of Clearance within their program application by the January 15 application deadline.

Detailed instructions for obtaining a Certificate of Clearance including the required LiveScan fingerprinting form LS-41 can be found on the commission's web site at <http://www.ctc.ca.gov/help/application/cert-of-clear.html>.

## Education

**NOTE:** A U.S. Government-issued social security number is required to apply for a Certificate of Clearance and the fingerprinting process.

Applicants who hold a valid (non-expired) Emergency 30-Day Substitute Teaching Permit are not required to reapply for a Certificate of Clearance. Please submit verification of your **valid** Emergency Permit with your program application by the January 15 application deadline.

Out-of-state/international applicants **must** contact the UCSC Education Department for further instructions: [education@ucsc.edu](mailto:education@ucsc.edu).

Applicants should be aware that a criminal conviction on their record may preclude them from obtaining a Certificate of Clearance.

### PROGRAM AND STATE OF CALIFORNIA REQUIREMENTS (NOT REQUIRED FOR INITIAL ADMISSION TO THE PROGRAM)

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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

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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 Politics 20, American Politics; Politics 111, Constitutional Law; Politics 120A, Congress, President, and the Court in American Politics; and History 25A, United States History to 1877.

### READING INSTRUCTION COMPETENCE ASSESSMENT (RICA)

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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. Candidates should not take this examination prior to completing course 220.

### CPR

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A certified cardiopulmonary resuscitation (CPR) course (infant, child, and adult) must be completed and valid upon application for the credential.

### TUBERCULOSIS (TB) TEST

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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.

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## BILINGUAL AUTHORIZATION CANDIDATES

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### 1. 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 web site at <http://www.cset.nesinc.com>.

### 2. 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](#).

### 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 needs and potential student teaching problems.
- 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, 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 during the Summer Bridge between the university summer and fall

## Education

quarters, constitutes the first classroom observation experience for students in the program. 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 is a two-quarter experience (winter/spring) in which student teachers are placed with cooperating teachers in local schools. 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 two-quarter 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 course 201 and 201A, Intermediate Student Teaching, and courses 202A-B-C, 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.

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### CAPSTONE REQUIREMENTS

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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.

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### MULTIPLE SUBJECT COURSE REQUIREMENTS

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200 Applied Classroom Analysis and Methods: Beginning Student Teaching  
201 Intermediate Student Teaching  
202A-B-C Advanced Student Teaching  
203 Methods of English Language Development  
205 Teaching, Learning, and Schooling  
207 Social Foundations of Education  
208 Portfolio Development  
210 Creating Supportive, Healthy Environments for Student Learning  
211 Teaching Special Populations

212A-B-C (Bilingual Authorization students only) Bilingualism and Biliteracy  
217 Topics in Elementary Education: Physical Education  
218 Topics in Elementary Education: Visual Arts  
219 Topics in Elementary Education: Performing Arts  
220 Reading and Language Arts for Elementary Classrooms  
221 Science Learning and Teaching in Elementary Classrooms  
222 Mathematics Learning and Teaching in Elementary Classrooms  
MA/C students must fulfill the requirements for Level 1 technology skills. Students meet this requirement in one of two ways: (a) passing the CSET examination, or (b) passing an approved course offered via UCSC Extension.

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### SINGLE SUBJECT COURSE REQUIREMENTS

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200 Applied Classroom Analysis and Methods: Beginning Student Teaching  
201 Intermediate Student Teaching  
201A Intermediate Student Teaching: Single Subject  
202A-B-C Advanced Student Teaching  
204 Methods of English Language Development  
206 Teaching, Learning, and Schooling  
207 Social Foundations of Education  
208 Portfolio Development  
210 Creating Supportive, Healthy Environments for Student Learning  
211 Teaching Special Populations  
212A-B-C (Bilingual Authorization students only) Bilingualism and Biliteracy  
225 Reading Across the Curriculum in Middle School and Secondary  
Single Subject Credential students enroll in the two methods courses related to their subject area:  
226 English Teaching: Theory and Curriculum  
227 English Teaching for Secondary Classrooms  
228 Math Education: Research and Practice  
229 Teaching Mathematics in the Secondary Classroom  
230 Science Education: Research and Practice  
231 Teaching Science in the Secondary Classroom  
232 Social Science: Theory and Curriculum  
233 Social Science Teaching for Secondary Classrooms

## Education

M.A./Credential students must fulfill the requirements for Level 1 technology skills. Students meet this requirement in one of two ways: (a) passing the CSET examination, or (b) passing an approved course offered via UCSC Extension.

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### FOR FURTHER INFORMATION

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Please contact the credential analyst by sending an e-mail to [education@ucsc.edu](mailto:education@ucsc.edu), or view the department's home page on the web at <http://education.ucsc.edu> where potential applicants can obtain full details about the programs.

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### ED.D. IN COLLABORATIVE LEADERSHIP

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**(Currently not admitting new students)**

#### OVERVIEW

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The goal of the Ed.D. program is to prepare educational professionals to enact research-based leadership in the transformation of schools and other educational institutions serving racially, culturally, and linguistically diverse communities in California's Central Coast and Bay Area region. Ed.D. students' dissertations apply cutting-edge theory and research in action-research reform efforts. Research projects will often be situated within the student's professional work site. Graduates of the Ed.D. program will be qualified for leadership positions in schools and school districts, as well as for the instruction of professional courses in universities and colleges. Graduates may also choose to work for independent or governmental policy centers.

#### ADMISSION REQUIREMENTS

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- M.A. or equivalent with a background in research methodology
- 3.0 grade point average (GPA) or above
- Official Graduate Record Examination (GRE) scores <http://www.gre.org/~> taken within the last five years
- Documentation of second language and/or multicultural focus
- Statement of Purpose
- Personal History
- A research project proposal
- Official transcripts from all undergraduate and graduate work
- Application essay
- Three current recommendation letters specifying potential for collaborative leadership and scholarly productivity.

- Application fee

Prior to completing your application, we highly recommend a personal interview with at least one of our faculty members. Please contact an Education Department faculty member whose research interest is similar to your own (please visit the Education Department web site at <http://education.ucsc.edu/>)

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### FOR FURTHER INFORMATION

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Contact the doctoral adviser by sending an e-mail to [edphd@lists.ucsc.edu](mailto:edphd@lists.ucsc.edu).

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### PH.D. IN EDUCATION

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#### OVERVIEW

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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. 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

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The minimum grade-point average (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

## Education

students, whether this manifests itself in a high grade-point average, strong letters of recommendation, or a high Graduate Record Examination (GRE) score, 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

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- 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 <http://www.gre.org/> taken within the last five years
- Experience working with culturally and linguistically diverse communities
- Statement of Purpose
- Personal History
- 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 scholarly productivity
- Current résumé
- Application fee
- International applicants must take the Test of English as a Foreign Language (TOEFL). 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. The TOEFL examination may be waived for international students who have taken and successfully passed a freshman composition course at an accredited university in the United States.

Prior to completing your application, we highly recommend a personal interview with at least one of our faculty members. Please contact an education faculty member whose research interest is similar to your own (please visit the Education Department web site at <http://education.ucsc.edu/>)

### PROGRAM REQUIREMENTS

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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 adviser will determine the overall individualized program of study, depending on the student's preparation, interests, and

plans, which are determined in consultation with relevant faculty and the department chair. The program encourages interdisciplinary study.

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.

The QE is intended to assess a student's depth and breadth of knowledge in his or her areas of concentrations and his/her competence to do extended dissertation-level research and analysis. Normally taken near the end of the third year of enrollment, the QE 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 his/her work at the oral examination.

A dissertation based on original research is required. After the dissertation has been completed and submitted, students must defend the dissertation in an oral examination.

### COURSE REQUIREMENTS AND SEQUENCING

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The following courses constitute the minimum requirements: four foundational courses, four research methods courses, and four elective courses. Incoming students should consult with their faculty advisers and 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.

Courses required in years one and two:

- EDUC 235, Introduction to Educational Inquiry
- EDUC 236, Quantitative Methods in Educational Research
- EDUC 237, Qualitative Research Methods
- EDUC 250, Teaching and Teachers
- EDUC 255, Intermediate Quantitative Methods; or EDUC 256, Advanced Qualitative Analysis
- EDUC 261, Thinking, Learning and Teaching

## Education

- EDUC 262, Social and Cultural Context of Education
- EDUC 272, Language in Education and Society

And four electives, two of which must be from the list below:

- EDUC 263, Foundations of Educational Reform
- EDUC 264, Research on Teacher Development and Teacher Education
- EDUC 268, Schools, Communities, and Families
- EDUC 280, Language and Literacy across disciplines
- EDUC 286, Research in STEM Education
- EDUC 295, Critical Perspectives on Education
  1. M.A. course in Education with additional readings and assignments (one maximum to count toward the four electives)
  2. Graduate courses in other departments
  3. Independent Study, Reading Group, Research Apprenticeship (EDUC 293), or undergraduate course with additional readings and assignments taken as is (one maximum undergraduate course to count toward the four electives)

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### REQUIREMENTS FOR THE M.A. DEGREE

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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, 60 course credits including 4 foundational courses, 4 research methods courses, 4 elective courses, and a second-year research project. Students seeking an M.A. degree must adhere to the guidelines set forth by the Graduate Division.

#### OTHER REQUIREMENTS

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Students are required to attend the Education Department's colloquium series during their first and second years in the program.

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.

Students are required to complete a second-year project paper by the first day of fall quarter in year three.

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### FINANCIAL SUPPORT

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It is each student's responsibility to secure funding for graduate studies. Over the course of students' enrollment in the graduate program, students typically

fund their education with some combination of the following: TAships, GSRships, UCSC graduate fellowships, scholarships or fellowships from outside sources, loans, personal savings, family income, and support from other individuals (e.g., extended family members). When possible, first-year students are supported with UCSC graduate fellowships which typically cover part of a student's expenses for the first year only. Beginning in the student's first year, he or she is strongly encouraged to apply for TAships in Education Department courses and in other departments on campus. Students are also encouraged to seek and apply for outside funding from government agencies, private foundations, and industry, and to plan alternative financing should none of these opportunities become available.

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, including the Chicano/Latino Research Center (CLRC), the Vocabulary Innovations in Education (VINE) project, The Teachers With Computers: Ward Annotations for Vocabulary Education (tecWAVE) project, Effective Science Teaching for English Language Learners (ESTELL) project, The Center for Collaborative Research for an Equitable California (CREC), and the Center for Educational Research in the Interest of Underserved Students (CERIUS).

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### DESIGNATED EMPHASIS IN EDUCATION

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The Designated Emphasis in Education enables doctoral students in other departments to pursue interests in education and obtain formal certification of a "minor" level of competence in the field of education. The requirements for obtaining a Designated Emphasis in Education are the following:

1. Obtain a designated graduate adviser from the faculty in education. This adviser will be in addition to the graduate adviser from the student's home department. The education adviser must serve on the student's qualifying examination committee and, as appropriate, may also serve on the student's dissertation committee.
2. Complete at least two of the following three core courses in education:
  - EDUC 261, Thinking and Learning
  - EDUC 262, Social and Cultural Contexts of Education

## Education

- EDUC 263, Foundations of Educational Reform
3. Complete additional courses as needed to total five graduate courses in education, no more than one of which may be a directed readings course (Independent Studies). Courses must be approved by the student's faculty adviser in the Education Department. Courses in other departments focused on education may be approved by petition to the Education Department's Doctoral Programs Committee.
  4. Prepare a significant piece of writing in some area of education. This writing may take the form of a substantial position paper (seminar paper, qualifying examination paper, dissertation chapter, master's thesis) grounded in the literature of educational research, as determined by the faculty adviser in education.

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.

The Education Department's foundational courses, EDUC 261 and 262, are offered in successive quarters every other year; and EDUC 263, an elective course, is offered every other year. The department typically offers five doctoral courses during each year. The Education Department annually admits 7-10 Ph.D. students, leaving room for doctoral students from other departments to take courses in education.

### FOR FURTHER INFORMATION

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Contact the doctoral graduate adviser by sending an e-mail to [edphd@ucsc.edu](mailto:edphd@ucsc.edu) or view the department's home page on the web at <http://education.ucsc.edu> where potential applicants can obtain full details about the programs.

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## EDUCATION FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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#### **Margaret (Greta) A. Gibson, Emerita**

#### **Ron Glass**

Education as a practice of freedom; research for equity; ethical issues in collaborative research; moral and political philosophy and education; ideology and education; race and education; school reform; democracy and education

#### **June A. Gordon**

Urban education; international comparative education; the impact of economics, culture and politics on educational attitudes and expectations of immigrants; marginalized youth; schooling and society in Japan, China, India, the U.K., and the U.S.A.; sociology of education

#### **Judit Moschkovich**

Mathematical thinking and learning; student conceptions of functions; mathematical discourse; everyday mathematical practices; bilingual mathematics learners

#### **Rodney Ogawa, Emeritus**

#### **Brad Olsen**

Teacher development (with emphasis on knowledge and identity), English education, and sociolinguistics

#### **Art Pearl, Emeritus**

#### **Lucinda Pease-Alvarez, Emerita**

#### **Trish Stoddart**

Teacher education, science education, educational reform

#### **David Swanger, Emeritus**

#### **Kip Téllez**

Preparation of teachers for linguistic and cultural diversity, second language learning, studies of the school curriculum, educational assessment

#### **Roland G. Tharp, Emeritus**

#### **C. Gordon Wells, Emeritus**

### ASSOCIATE PROFESSOR

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#### **Doris Ash**

Informal science learning, teacher professional development, science discourse in and out of the classroom

#### **Lora Bartlett**

Educational policy and school reform, schools as workplaces for teachers, the conditions of teachers' commitment

#### **George Bunch**

Language and education in linguistically diverse settings, preparation of teachers for linguistic diversity, language policy, and bilingualism

#### **Judith Scott**

Literacy and language learning, particularly with students who depend on schools to learn about

## Education

academic language; reading, writing, vocabulary development; vocabulary assessment; teachers' professional development through collaboration and inquiry

**Jerome Shaw, Emeritus**

ASSISTANT PROFESSOR

**Cynthia Cruz**

Feminist ethnography; community-based learning; decolonial pedagogies; LGBTQ street youth; women of color thought; cultural studies and education

**Eduardo Mosqueda**

Mathematics education of English learners; large-scale data set quantitative analysis; urban education issues



PROFESSOR

**Catherine R. Cooper (Psychology)**

Cultural perspectives on child and adolescent development; linkages among families, peers, schools, and work; issues of diversity, ethnicity, and gender in identity; research, practice, and policy in university outreach programs; linking qualitative and quantitative research

**Bruce N. Cooperstein (Mathematics)**

Algebra, algebraic number theory

**Barbara Rogoff (Psychology)**

Human development in sociocultural activity; informal and formal arrangements for learning; adult/child and peer communication in families and schools in diverse cultural communities; learning through observation; cognitive development, especially problem solving, planning, and attention

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## EDUCATION COURSES

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### LOWER-DIVISION COURSES

**50A. CAL Teach 1: Science and Mathematics (2 credits).**

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. Enrollment limited to 25. (General Education Code(s): PR-S.) The Staff

**50B. CAL Teach 1: Mathematics (2 credits). F,W**

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. Enrollment limited to 25. (General Education Code(s): PR-S.) The Staff

**50C. CAL Teach 1: Science (2 credits). F,W**

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. Enrollment limited to 25. (General Education Code(s): PR-S.) The Staff

**60. Introduction to Education: Learning, Schooling, and Society. F,S**

Explores the foundations of learning and teaching, the social and political forces within schools and school systems in the U.S., and the educational policies and practices in culturally and linguistically diverse communities. (General Education Code(s): IS, E.) L. Bartlett, D. Ash

**99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### UPPER-DIVISION COURSES

**100A. Cal Teach 2: Science and Mathematics (2 credits). W**

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

## Education

supports and enhances students' internship experience. (Formerly course 75A.) (General Education Code(s): W satisfied by taking this course and course 185L.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; course 50A, 50B, or 50C; and acceptance into the Cal Teach program. Enrollment restricted to sophomores, juniors, and seniors. Enrollment limited to 25. The Staff

### **100B. Cal Teach 2: Mathematics (2 credits). S**

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. (Formerly course 75B.) (General Education Code(s): W satisfied by taking this course and course 185L.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; course 50A, 50B, or 50C; and acceptance into the Cal Teach program. Enrollment restricted to sophomores, juniors, and seniors. Enrollment limited to 25. The Staff

### **100C. Cal Teach 2: Science (2 credits). S**

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. (Formerly course 75C.) (General Education Code(s): W satisfied by taking this

course and course 185L.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; course 50A, 50B, or 50C; and acceptance into the Cal Teach program. Enrollment restricted to sophomores, juniors, and seniors. Enrollment limited to 25. The Staff

### **102. Education, Media, and Society. F**

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. 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. (General Education Code(s): IM.) The Staff

### **104. Ethical Issues and Teaching.**

\* 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. 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. The Staff

### **115. K-12 Student Assessment. W**

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. 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. K. Tellez

### **120. The Arts in Schools: Aesthetic Education Theory and Practice. S**

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. 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. (General Education Code(s): IM.) B. Olsen

### **125. Multicultural Children's Literature for Elementary Classrooms. S**

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

## Education

literature into elementary- and middle-school curriculum areas. (Formerly Introduction to Teaching Children's Literature in Grades K–8.) Enrollment is restricted to junior and senior majors in education, minors in STEM, and junior and senior majors in physics education, mathematics education, Earth sciences education, and biology education, or by permission of instructor. J. Scott

### **128. Immigrants and Education. F**

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. 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. (General Education Code(s): ER, E.) E. Mosqueda

### **135. Gender and Education. W**

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. 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. C. Cruz

### **140. Language, Diversity, and Learning. S**

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. 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. (General Education Code(s): ER, E.) The Staff

### **141. Bilingualism and Schooling. W**

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. 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. (General Education Code(s): E.) G. Bunch

### **160. Issues in Educational Reform. F**

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. 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. The Staff

### **164. Urban Education. \***

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. 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. Satisfies American History and Institutions Requirement. (General Education Code(s): E.) E. Mosqueda

### **170. East Asian Schooling and Immigration. F**

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. (Formerly Schools and Asian Cultures.) 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. (General Education Code(s): CC.) J. Gordon

**171. South and Southeast Asian Schooling and Immigration. S**

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. 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. (General Education Code(s): CC.) J. Gordon

**173. Seminar in Critical Pedagogy. F**

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. 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. May be repeated for credit. The Staff

**177. Teaching Culturally and Linguistically Diverse Students Math and Science. W**

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 course 180 is advised. 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. (General Education Code(s): ER.) P. Stoddart

**178. Advanced Educational Studies. \***

Advanced academic development, field research, and guided experiential learning for students planning to work in education. Enrollment by interview only. Enrollment restricted to juniors and seniors. May be applied only once to the minor. 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. May be repeated for credit. The Staff

**180. Introduction to Teaching. F,W**

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(s): course 60. Enrollment restricted to education minors or by permission of instructor. Enrollment limited to 120. (General Education Code(s): PR-S.) J. Gordon, P. Stoddart

**181. Race, Class, and Culture in Education. F**

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. 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. (General Education Code(s): ER, E.) C. Cruz

**182. American Teacher. W**

Examines multiple and competing images of "teachers" and, more specifically, notions of the "good teacher"; also explores social, cultural, historical, and policy context of teachers' work in the U.S. 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. The Staff

**183. Children's Mathematical Thinking. S**

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(s): course 60. Enrollment restricted to education or STEM minors; physics education majors; students with math education concentration; Earth Sciences science education

## Education

concentration; biology B.A. bioeducation; or by instructor permission. J. Moschkovich

### **185B. Introduction to Mathematics Education. W**

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. (Formerly Introduction to Teaching Mathematics.) Enrollment restricted to majors in mathematics, physics, Earth sciences, computer science, computer engineering, and electrical engineering or to STEM minors or by permission of the instructor, or by permission of instructor. J. Moschkovich

### **185C. Introduction to Teaching Science. S**

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. Enrollment restricted to juniors, seniors, or education minors or by permission of instructor. The Staff

### **185L. Introduction to Teaching: Cal Teach 3 (3 credits). S**

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; course 50A, 50B, or 50C; course 100A, 100B, or 100C; course 185B or 185C. Enrollment restricted to juniors and seniors or education minors, or by permission of instructor. (General Education Code(s): W satisfied by taking this course and one of the following: courses 100A, 100B, and 100C.) Enrollment limited to 30. The Staff

### **187. Cognition and Instruction. \***

Addresses the question, "How do people learn?" by examining theories of learning and research on cognition, learning, and instruction. Enrollment restricted to juniors, seniors, or education minors, or by permission of instructor. The Staff

### **194. Group Projects. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **194F. Group Projects (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **197A. Cal Teach Special Project (1 credit). F,W,S**

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 by interview only. Prerequisite(s): course 50A, 50B, or 50C. Enrollment restricted to majors in the physical and biological sciences and majors in the school of engineering or by permission of instructor. May be repeated for credit. The Staff

### **197B. Cal Teach Special Project (2 credits). F,W,S**

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 by interview only. Prerequisite(s): course 50A, 50B, or 50C. Enrollment restricted to majors in the physical and biological sciences and majors in the school of engineering or by permission of instructor. May be repeated for credit. The Staff

### **197C. Cal Teach Special Project (3 credits). F,W,S**

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 by interview only. Prerequisite(s): course 50A, 50B, or 50C. Enrollment restricted to majors in the physical and biological sciences and majors in the school of engineering or by permission of instructor. May be repeated for credit. The Staff

### **198. Independent Field Study. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **198F. Independent Field Study (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## Education

### **199. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## **GRADUATE COURSES**

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### **200. Beginning Student Teaching. F**

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. (Formerly Applied Classroom Analysis and Methods: Beginning Student Teaching.) Enrollment restricted to MA/credential students. The Staff

### **201. Intermediate Student Teaching. W**

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(s): course 200. Enrollment restricted to MA/credential students. The Staff

### **201A. Intermediate Student Teaching: Single Subject. W**

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 course 201. Weekly supervision and seminars with teacher supervisors are required. Prerequisite(s): course 200. Enrollment restricted to MA/credential students. The Staff

### **202A. Advanced Student Teaching. S**

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(s): course 201. Enrollment restricted to M.A./credential students. The Staff

### **202B. Advanced Student Teaching. S**

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(s): course 201. Enrollment restricted to M.A./credential students. The Staff

### **202C. Advanced Student Teaching. S**

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(s): course 201. Enrollment restricted to

M.A./credential students. The Staff

### **203. Teaching English Language Development: Foundations, Approaches, and Strategies. W**

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. (Formerly, Methods of English Language Development: Multiple Subject Credential) Enrollment restricted to MA/credential students. The Staff

### **204. Methods of English Language Development: Single Subject. F**

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. Enrollment restricted to MA/credential students. G. Bunch, The Staff

### **205. Teaching, Learning, and Schooling in a Diverse Society: Multiple Subject.**

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; second, schooling, as the context of teaching/learning both in its existent structures and its reform

## Education

movements; third, the sociocultural context in which educational institutions exist, topics such as cultural and historical forces, political and economic condition, family, and community structures. Enrollment restricted to MA/credential students. The Staff

### **206. Teaching, Learning, and Schooling: Single Subject.**

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. Enrollment restricted to MA/credential students. Enrollment limited to 30. The Staff

### **207. Social Foundations of Education.**

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. Enrollment restricted to MA/credential students. The Staff

### **208. Portfolio Development (2 credits). \***

Offered in summer. Provides student and faculty adviser with time to confer over the completion of the required portfolio. Enrollment restricted to MA/credential students. The Staff

### **210. Health, Safety, and Community (2 credits).**

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. Enrollment restricted to MA/credential students. The Staff

### **211. Topics in Elementary Education: Teaching Special Populations (2 credits). F**

Addresses the preparation of teachers for meeting needs of special populations within the general education setting. Covers basic knowledge, skills, and strategies. Enrollment restricted to MA/credential students. The Staff

### **212A. Bilingualism and Biliteracy: History, Politics, Theory, and Practice (2 credits). F**

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. Enrollment restricted to MA/credential students. The Staff

### **212B. Bilingualism and Biliteracy: Language, Literacy and Content Instruction (2 credits). W**

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. Enrollment restricted to MA/credential students. The Staff

### **212C. Bilingualism and Biliteracy: Community and School Partnerships (2 credits). S**

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. Enrollment restricted to MA/credential students. The Staff

### **213. Child and Adolescent Development for Educators (2 credits).**

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. Enrollment restricted to graduate students. Enrollment limited to 25. The Staff

### **217. Topics in Elementary Education: Physical Education (2 credits).**

Offered in summer. 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. Enrollment restricted to MA/credential students. The Staff

### **218. Topics in Elementary Education: Visual Arts (2 credits).**

Offered in summer. Examines pedagogical understanding in teaching visual arts. Introduces candidates to theoretical and research basis for teaching visual arts and content standards and

## Education

frameworks. Also investigates and presents instructional practices. Enrollment restricted to MA/credential students. The Staff

### **219. Topics in Elementary Education: Performing Arts (2 credits).**

Offered in summer. 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. Enrollment restricted to MA/credential students. The Staff

### **220. Reading and Language Arts for Elementary Classrooms. F**

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. Enrollment restricted to MA/credential students. J. Scott, K. Tellez

### **221. Science Learning and Teaching in Elementary Classrooms. W**

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. Students are billed a materials fee. Enrollment restricted to MA/credential students. The Staff

### **222. Mathematics Learning and Teaching in Elementary Classrooms. F**

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. Enrollment restricted to MA/credential students. The Staff

### **225. Reading Across the Curriculum in Middle School and Secondary.**

Offered in summer. 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. Enrollment restricted to MA/credential students. The Staff

### **226. English Teaching: Theory and Curriculum. F**

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. Enrollment restricted to MA/credential students. The Staff

### **227. English Teaching for Secondary Classrooms. W**

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. Enrollment restricted to MA/credential students. The Staff

### **228. Math Education: Research and Practice. F**

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. Enrollment restricted to MA/credential students. J. Moschkovich

### **229. Teaching Mathematics in the Secondary Classroom. W**

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(s): course 228. Enrollment restricted to MA/credential students. The Staff

## Education

### **230. Science Education: Research and Practice. F**

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. Enrollment restricted to MA/credential students. D. Ash

### **231. Teaching Science in the Secondary Classroom. W**

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. Students are billed a materials fee. Enrollment restricted to MA/credential students. The Staff

### **232. Social Science: Theory and Curriculum. F**

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. Enrollment restricted to MA/credential students. The Staff

### **233. Social Science Teaching for Secondary Classrooms. W**

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.

Enrollment restricted to MA/credential students. The Staff

### **235. Introduction to Educational Inquiry. F**

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. Enrollment restricted to graduate students. Enrollment limited to 15. J. Scott

### **236. Quantitative Methods in Educational Research. W**

Promotes intermediate-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. Enrollment restricted to graduate students. Enrollment limited to 15. E. Mosqueda

### **237. Qualitative Research Methods. S**

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. Enrollment restricted to graduate students; priority is given to graduate students in education. Enrollment limited to 12. L. Bartlett

### **250. Teaching and Teachers. F**

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. Enrollment is restricted to graduate students. Enrollment limited to 15. K. Tellez

### **251. Analysis of Activity and Interaction in Educational Settings. \***

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(s): course 237. Enrollment restricted to graduate students. Enrollment limited to 12. May be repeated for credit. The Staff

### **252. Hermeneutics of Education. \***

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? Enrollment restricted to graduate students. Enrollment limited to 12. B. Olsen

### **253. Research Design in Mathematics and Science Education. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. J. Moschkovich

**254. Critical and Alternative Paradigms in Education Research. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. C. Cruz

**255. Intermediate Quantitative Methods. S**

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(s): introductory statistics course (course 236 or equivalent). Enrollment restricted to graduate students. Enrollment limited to 15. E. Mosqueda

**256. Advanced Qualitative Analysis in Education Research. \***

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.

Enrollment restricted to graduate students. Enrollment limited to 15. May be repeated for credit. C. Cruz

**260. The Teacher and The School: An Investigation of Related Practice, Reform, and Research. \***

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. Enrollment restricted to graduate students. Enrollment limited to 12. B. Olsen

**261. Thinking, Learning, and Teaching. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. J. Scott

**262. Social and Cultural Context of Education. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. M. Gibson

**263. Foundations of Educational Reform. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. R. Ogawa

**264. Research on Teacher Development and Teacher Education. S**

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. Enrollment restricted to graduate students. Enrollment limited to 15. B. Olsen

**265. Teacher as Educational Policy Maker. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. L. Pease-Alvarez

**266. Program Evaluation and Action Research in Educational Reform. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. K. Tellez

**268. Schools, Communities, and Families. \***

Examines the nexus of schools, communities, and families, and, in particular, how collaboration across institutional boundaries can facilitate school and community reform. Enrollment restricted to graduate students. Enrollment limited to 15. R. Glass

**269A. First-Year Doctoral Proseminar (2 credits). \***

This three-quarter seminar supports professional development for first-year doctoral students. Students develop essential skills for success as scholars, discuss issues in educational research and practice, and are introduced to research by Education Department faculty. Enrollment restricted to education graduate students. Enrollment limited to 15. G. Bunch

**269B. First-Year Doctoral Proseminar (2 credits). \***

This three-quarter seminar supports professional development for first-year doctoral students. Students develop essential skills for success as scholars, discuss issues in educational research and practice, and are introduced to research by Education Department faculty. Enrollment restricted to education graduate students. Enrollment limited to 15. G. Bunch

**269C. First-Year Doctoral Proseminar (2 credits). \***

This three-quarter seminar supports professional development for first-year doctoral students. Students develop essential skills for success as scholars, discuss issues in educational research and practice, and are introduced to research by Education Department faculty. Enrollment restricted to education graduate students. Enrollment limited to 15. G. Bunch

**270A. Second-Year Professional Development Seminar (2 credits). \***

Three-quarter seminar supports professional development for second-year doctoral students. Activities include preparation of research and conference proposals, presentation of second-year project findings, and attendance at department colloquia. Enrollment restricted to second-year Ph.D. students. Enrollment limited to 12. J. Scott

**270B. Second-Year Professional Development Seminar (2 credits). \***

Three-quarter seminar supports professional development for second-year doctoral students. Activities include preparation of research and conference proposals, presentation of second-year project findings, and attendance at department colloquia. Enrollment restricted to second-year Ph.D. students. Enrollment limited to 12. J. Scott

**270C. Second-Year Professional Development Seminar (2 credits). \***

Three-quarter seminar supports professional development for second-year doctoral students. Activities include preparation of research and conference proposals, presentation of second-year project findings, and attendance at department colloquia. Enrollment restricted to second-year Ph.D. students. Enrollment limited to 12. J. Scott

**271. Theoretical Perspectives on Learning and Using Literacy. \***

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. Enrollment restricted to graduate students. Enrollment limited to 12. J. Scott

**272. Sociolinguistics in Education. W**

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. Enrollment restricted to graduate students. Enrollment limited to 15. B. Olsen

**273. Language Acquisition, Bilingualism, and Education. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. G. Bunch

**274. Language and Power in Education. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. B. Olsen

## Education

### **276. Theory and Practice of Writing.\***

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. Enrollment restricted to graduate students. Enrollment limited to 15. G. Bunch, L. Pease-Alvarez

### **277A. Second-year Doctoral Proseminar (2 credits).\***

This three-quarter seminar supports professional development for second-year doctoral students as they prepare their qualifying materials and begin dissertation work. Prerequisite(s): courses 269 A-B-C. Enrollment restricted to graduate students. Enrollment limited to 20. The Staff

### **277B. Second-year Doctoral Proseminar (2 credits).\***

This three-quarter seminar supports professional development for second-year doctoral students as they prepare their qualifying materials and begin dissertation work. Prerequisite(s): courses 269 A-B-C. Enrollment restricted to graduate students. Enrollment limited to 20. The Staff

### **277C. Second-year Doctoral Proseminar (2 credits).\***

This three-quarter seminar supports professional development for second-year doctoral students as they prepare their qualifying materials and begin dissertation work. Prerequisite(s): courses 269 A-B-C. Enrollment restricted to graduate students. Enrollment limited to 20. The Staff

### **278. Critical Exploration of Reading Theory and Practice.\***

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. Enrollment restricted to graduate students. Enrollment limited to 15. J. Scott

### **279A. Dissertation Supervision for Ed.D..\***

Supervision of Ed.D. candidate through third and fourth year of research analysis, writing, and editing of dissertation. Preparation for oral defense and assistance with bringing dissertation to standards of publication and conference presentation. Enrollment restricted to Ed.D. graduate students. Enrollment limited to 20. The Staff

### **279B. Dissertation Supervision for Ed.D..\***

Supervision of Ed.D. candidate through third and fourth year of research analysis, writing, and editing of dissertation. Preparation for oral defense and assistance with bringing dissertation to standards of publication and conference presentation. Enrollment restricted to Ed.D. graduate students. Enrollment limited to 20. The Staff

### **279C. Dissertation Supervision for Ed.D..\***

Supervision of Ed.D. candidate through third and fourth year of research analysis, writing, and editing of dissertation. Preparation for oral defense and assistance with bringing dissertation to standards of publication and conference presentation. Enrollment restricted to Ed.D. graduate students. Enrollment limited to 20. The Staff

### **280. Academic Language.\***

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. Enrollment restricted to graduate students. Enrollment limited to 15. G. Bunch

### **281. Conceptual Change in Science and Mathematics.\***

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. Enrollment restricted to graduate students. Enrollment limited to 12. J. Moschkovich

### **282. Informal Learning in Sciences and Mathematics.\***

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. Enrollment restricted to graduate students. Enrollment limited to 15. D. Ash

## Education

### **283. Equity and Social Justice in Mathematics and Science Education. \***

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. Enrollment restricted to graduate students. J. Shaw

### **284. Gender in Mathematics and Science Education. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. D. Ash

### **285. Culture and Learning. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. J. Moschkovich

### **286. Special Topics in Math and Science Education. W**

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. Enrollment restricted to graduate students. Enrollment limited to 15.

May be repeated for credit. D. Ash

### **287. Issues in Educational Assessment. \***

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. Enrollment restricted to graduate students. Enrollment limited to 12. J. Shaw

### **288. Ethnographies of Education. \***

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. Enrollment restricted to graduate students. Enrollment limited to 12. The Staff

### **289. School Organization. \***

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. Enrollment restricted to graduate students. Enrollment limited to 12. R. Ogawa

### **290. CHAT and Educational Practice and Research. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. J. Moschkovich

### **291. Globalization and Transnationalism in Education. \***

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. (Formerly "Comparative and International Education.") Enrollment restricted to graduate students. Enrollment limited to 15. J. Gordon

### **292. Ideology and Education. \***

Philosophical study of the theory of ideology from Marx to the present and how ideologies (racism, sexism, classism, linguisticism, abilityism) become embodied, reproduced, resisted, and transformed (and particularly the role of education therein). Enrollment restricted to graduate students. Enrollment limited to 22. R. Glass

### **293A. Research Apprenticeship (2 credits). F,W,S**

Research apprenticeship under guidance of faculty member during first or second year of doctoral studies. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **293B. Research Apprenticeship. F,W,S**

Research apprenticeship under guidance of faculty member during first or second year of doctoral studies. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **294. Second-Year Research Project. F,W,S**

Doctoral students work with faculty advisors to plan, carry out, and

## Education

write up small independent research project during second year of graduate studies. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **295. Critical Theories of Education. F**

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. Enrollment restricted to graduate students. Enrollment limited to 15. C. Cruz

### **296. Educational Policy and the Context of Teachers' Work. \***

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. Enrollment restricted to graduate students. Enrollment limited to 12. L. Bartlett

### **297. Independent Study. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **297F. Independent Study (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **298. TA Apprenticeship (2 credits). F,W,S**

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. Course cannot be repeated for course credit. Enrollment restricted to graduate students. The Staff

### **299. Thesis Research. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

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# SCHOOL OF ENGINEERING

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## 2015-16 General Catalog

Baskin School of Engineering  
335 Baskin Engineering Building  
(831) 459-2158  
<http://www.soe.ucsc.edu>

Dean's Office  
335 Baskin Engineering  
(831) 459-2158

Undergraduate Office  
227 Baskin Engineering  
(831) 459-5840

Graduate Office  
298J/K Engineering 2  
(831) 459-5737  
(831) 459-2576

**Professor Joseph Konopelski, Dean**

**Professor Tracy Larrabee, Associate Dean for Undergraduate Affairs**

**Professor Lise Getoor, Associate Dean for Research**

**Professor Patrick Mantey, Associate Dean for Industry Programs**

**Professor Brent Haddad, Associate Dean for Technology Management**

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## BASKIN SCHOOL OF ENGINEERING

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The Baskin School of Engineering 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 and Statistics, the Department of Biomolecular Engineering, the Department of Computer Engineering, the Department of Computational Media, the Department of Computer Science, the Department of Electrical Engineering, and the Department of Technology Management.

- Biomolecular engineering and bioinformatics master of science (M.S.) and doctor of philosophy (Ph.D.)
- Computer engineering M.S. and Ph.D.
- Computer science M.S. and Ph.D.
- Games and playable media M.S.
- Electrical engineering M.S. and Ph.D.
- Statistics and applied mathematics M.S. and Ph.D.
- Technology and information management 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.

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## UNDERGRADUATE STUDY

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The School of Engineering offers 12 undergraduate degree programs in the following majors:

- Bioengineering bachelor of science (B.S.)
- Bioinformatics B.S. or combined B.S./Graduate
- Computer engineering B.S. or combined B.S./M.S.
- Computer science bachelor of arts (B.A.) and B.S.
- Computer science: computer game design B.S.

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## GRADUATE STUDY

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The Baskin School of Engineering offers 13 graduate programs designed to prepare students for advanced study and research in major areas of biomolecular, computer, and electrical engineering, as well as computer science and statistics and applied mathematics:

## School of Engineering

- Electrical engineering B.S.
- Network and digital technology B.A.
- Robotics engineering B.S.
- Technology and information management B.S.

**Bioengineering.** The bioengineering program prepares graduates for a rewarding career at the interfaces between engineering, medicine and biology. UCSC bioengineering graduates will have a thorough grounding in the principles and practices of bioengineering 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. The program includes a broad range of courses in the sciences, engineering, ethics, and other topics, and is co-sponsored by the Departments of Biomolecular Engineering, Computer Engineering, Electrical Engineering, and Molecular, Cell and Developmental Biology.

**Bioinformatics.** The bioinformatics curriculum combines mathematics, the physical sciences, computer science, and engineering to explore and understand biological data from high-throughput experiments, such as genome sequencing and gene expression chips. 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 mathematics, science, and engineering. The undergraduate bioinformatics degree program prepares students for graduate school or a career in the fast-paced pharmaceutical or biotechnology industries.

**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 computer engineering B.S. program is accredited by The Engineering Accreditation Commission of ABET, <http://www.abet.org>. 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, as well as courses in physics or chemistry. 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, communications, or 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, <http://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 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.

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## UNDERGRADUATE MINORS

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Undergraduate students may choose from the following seven 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.

**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.

**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.

**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.

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## UNDERGRADUATE ADVISING OFFICE

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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 web site: <http://ua.soe.ucsc.edu/>.

## 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, 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:

### COMMON ENTRANCE EXAMINATION FOR ADMISSION TO POLYTECHNICS

CEEP 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 5J: Introduction to Programming in Java
	4,5	Computer Science 12A/L: Introduction to Programming
Computer Science:		
Exam AB	4,5	Computer Science 12 A/L: Introduction to Programming

CEEP AP Exam	Score	UCSC Course Credit
		and Lab and Computer Science 12B/M: Introduction to Data Structures Lab
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 AMS 3: Precalculus
Mathematics:		
Calculus AB	4 or 5	Mathematics 19A: Calculus for Science, Engineering and Math
Mathematics:		
Calculus BC	3	Mathematics 19A: Calculus for Science, Engineering and Math (enrollment in first quarter calculus is recommended for proposed majors in the School of Engineering)
Mathematics:		
Calculus BC	4 or 5	Mathematics 19A: Calculus for Science, Engineering and Math and Mathematics 19B: Calculus for Science, Engineering and Math
Statistics	4 or 5	Applied Mathematics and Statistics 5

### INTERNATIONAL BACCALAUREATE CREDIT

IBH Exam	Score	UCSC Course Credit
Computer Science	5	Computer Science 12A/L: Introduction to Programming and Lab
Computer Science	6 or 7	Computer Science 12A/L: Introduction to Programming and Lab and Computer Science 12B/M: Introduction to Data Structures and Lab

## School of Engineering

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

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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. Some school of engineering programs offer direct acceptance to qualified first-year applicants. For those engineering majors offering direct acceptance, admission is based upon high school grade point average, courses completed in mathematics and sciences, scores on standardized tests, and/or their personal statement. Some majors may specify criteria for directly accepted students to remain declared in the major. Please consult the department program statements for more information about which majors offer direct admission for first-year students and additional criteria, where applicable.

### POST FIRST-YEAR CURRENT STUDENTS ACCEPTANCE TO MAJORS

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Students interested in declaring a School of Engineering major can do so by following the major declaration policy for that major as specified in the corresponding program statement. Major declaration must be completed by the sixth quarter of study at UCSC, but can be done earlier. Students are encouraged to declare as early as possible, to ensure placement into courses required for the major. Specific information about requirements and the School of Engineering major declaration process can be found at <http://ua.soe.ucsc.edu/>.

### JUNIOR TRANSFER ACCEPTANCE TO MAJORS

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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.

Transfer students should **not** follow the Intersegmental General Education Transfer Curriculum (IGETC) because it will not provide transfer students with enough mathematics and engineering courses to allow them to complete School of Engineering programs at UCSC in two years.

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.

Junior transfers who do not list a School of Engineering major on their application to UCSC will not be considered for admission to such majors after the first day of their first quarter on campus. Junior transfers who are qualified by the applicable declaration of major deadline will be considered by exception.

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 (accepted as equivalent to Computer Science 12A/L or Computer Engineering 13/L, Computer Science 12B/M, and Computer Engineering 12/L) are strongly recommended.

Students who are approved for acceptance and who have course credit for all the lower-division major requirements must declare the major in their first term of enrollment at UCSC. The status of students who are approved for acceptance but who, upon review of their transcripts, are found not to have course credit for all the lower-division major requirements must complete those courses during their first term at UCSC in order to declare the major at the beginning of the following term at UCSC.

Students who are unsuccessful in their attempt to complete their remaining lower-division major requirement courses should be prepared to declare an alternative major outside of the School of Engineering.

### COURSE SUBSTITUTIONS

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Undergraduate engineering students who wish to complete a course at another institution or study abroad must first consult the School of Engineering Undergraduate Advising Office. The advising office may require that a Petition for Course Substitution be approved before credit for a course completed at another institution can be applied to any School of Engineering major requirement. This petition is in addition to and separate from the transfer credit awarded by the university. Petition forms are available at the undergraduate advising office and online at <http://ua.soe.ucsc.edu/policies-forms>. Each petition must be accompanied by a course description, syllabus, and verification of the number of credits earned with a

grade of C or better. To guarantee equivalency, departments may sometimes require a grade of B or better. It is very helpful if students can provide further evidence of course content, such as examples of programming assignments, homework, or examinations.

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## APPEAL PROCESS

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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, the college, and the Office of the Registrar of the decision.

If you have further questions concerning the appeal process, please contact the Undergraduate Student Affairs Office at (831) 459-5840 or e-mail [advising@soe.ucsc.edu](mailto:advising@soe.ucsc.edu).

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## LETTER GRADE POLICY

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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.

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## ETHICS REQUIREMENT

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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 at <http://www.ieee.org/about/corporate/governance/p7-8.html> and <http://www.acm.org/about/code-of-ethics>. Students of the Baskin School of Engineering are also expected to adhere to high ethical standards while pursuing their undergraduate studies.

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## COURSES TAKEN ELSEWHERE AFTER ENROLLMENT

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Once enrolled in the School of Engineering continuing students must have permission to subsequently take courses elsewhere. Course substitutions, such as taking a course at another UC campus, in the Education Abroad Program (EAP), or at a community college, require approval prior to taking the class.

Continuing students must get pre-approval before taking a class at a California community college. Applications and procedures for pre-approval can be obtained from and submitted to the Undergraduate Advising Office.

When a student declares their major, minor, or proposed major in a School of Engineering program, the decision as to whether a course taken elsewhere is accepted for this School of Engineering major or minor is made by the major department at that point. (Note: There is no guarantee that a course will be applicable toward a School of Engineering major, minor, or proposed major even if the student has completed more advanced courses in that department.)

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## SCHOOL-WIDE INFORMATION AND POLICIES

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### COMPUTING FACILITIES

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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 <http://its.ucsc.edu/>.

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### PREREQUISITES

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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.

For example, to enroll in Computer Science 101, a prerequisite to many upper-division courses, the prerequisite courses that must be completed or in progress are Computer Science 12B, Computer Engineering 16, Mathematics 19B, and one of the following: Mathematics 21, 22, 23A, 24, or Applied Mathematics and Statistics 10.

Students who have transferable course work from another institution that appears to satisfy a UCSC course prerequisite, but is not listed in current

## School of Engineering

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 the Course Substitutions section under Admission to School of Engineering Majors.)

### PERMISSION NUMBERS

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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.

### MATERIALS FEE

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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:

<https://intranet.soe.ucsc.edu/lab-support/fees>.

### MISCELLANEOUS FEES

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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:

<https://intranet.soe.ucsc.edu/lab-support/fees>.

Revised: 09/01/15

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# APPLIED MATHEMATICS AND STATISTICS

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2015-16 General Catalog

Baskin School of Engineering

(831) 459-2158

<http://www.soe.ucsc.edu>

[Faculty](#) | [Course Descriptions](#)

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## PROGRAM DESCRIPTION

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Applied mathematics and statistics are disciplines 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. Applied mathematical modeling often involves the use of systems of (partial) differential equations to describe and predict the behavior of complex real-world systems that unfold dynamically in time. 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 Applied Mathematics and Statistics Department at UCSC offers master's and doctoral programs in Statistics and Applied Mathematics, or Applied Mathematics and Statistics, depending on chosen emphasis, and a master's program in Scientific Computing and Applied Mathematics (SciCAM). 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, a minor in statistics, and a minor in applied mathematics.

Additional information on these programs can be found on the department's web pages at [www.soe.ucsc.edu](http://www.soe.ucsc.edu).

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### UNDERGRADUATE PROGRAMS

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#### REQUIREMENTS OF THE MINOR IN STATISTICS

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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.

Students are required to take a two-quarter basic calculus sequence:

- Applied Mathematics and Statistics 11A-B or Economics 11A-B or Applied Mathematics and Statistics 15A-B or Mathematics 11A-B or Mathematics 19A-B or Mathematics 20A-B
- Plus one course from each of the following seven categories:
  - Statistical Concepts: Applied Mathematics and Statistics 5 or 7/L
  - Computer Programming: Biomolecular Engineering 160/L, Computer Science 12A/L or 5C or 5J or 5P or Computer Engineering 13/L
  - Linear Algebra: Applied Mathematics and Statistics 10 or Mathematics 21 (also recommended that students take Applied Mathematics and Statistics 20 or Mathematics 24)
  - Multivariate Calculus: Mathematics 22 or both Mathematics 23A and Mathematics 23B
  - Probability: Applied Mathematics and Statistics 131 Applied Mathematics and Statistics 203 or Computer Engineering 107
  - Statistical Inference: Applied Mathematics and Statistics 132
  - Computational Methods: Applied Mathematics and Statistics 147
- Plus two electives from the following category:
  - Statistical Elective: Applied Mathematics and Statistics 156; 198; 202; 205B; 206B; 207; 256;
  - Biomolecular Engineering 205; Computer Engineering 108; 145; Computer Science 142; Economics 104; 113; 114; 120; 161B; and 190; Electrical Engineering 151; Mathematics 114; Psychology 181; Sociology 103A; Technology and Information Management 230.

## Applied Mathematics and Statistics

**Note:** Students planning graduate work in statistics are recommended to choose Mathematics 23A-B, Applied Mathematics and Statistics 205B, and Mathematics 105A-B.

### REQUIREMENTS OF THE MINOR IN APPLIED MATHEMATICS

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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.

Students are required to take the four-quarter calculus sequence:

- Calculus Sequence: Mathematics 19A-B or Mathematics 20A-B, and Mathematics 23A-B
- Plus one of the following sequences:
  - Applied Mathematics and Statistics 10 and 20
  - Mathematics 21 and 24
  - Physics 116A and 116B

**Note:** Students who complete Mathematics 21 and 24 or Physics 116A and 116B, are strongly recommended to complete the MATLAB self-paced tutorial at:

<http://matlab-training.soe.ucsc.edu/>

- Plus one course from each of the following categories:
  - Probability Theory: Applied Mathematics and Statistics 131 or Computer Engineering 107
  - Dynamical Systems: Applied Mathematics and Statistics 114 or Applied Mathematics and Statistics 214
  - Introduction to Numerical Methods: Applied Mathematics and Statistics 147, Physics 115, or Earth Sciences 119
  - Partial Differential Equations: Applied Mathematics and Statistics 212A, Physics 116C, or Mathematics 107
- Plus one applied-mathematics elective from the following list:
- Applied Mathematics elective: Applied Mathematics and Statistics 107/217, 115/215, 132, 198, 212B, 213, 216, 231, 290B
- Electrical Engineering 103, 154; Computer Engineering 115; Mathematics 103A, 117, 121A; Physics 105, 139A, 139B, 171.

Students may also propose other electives which use applied mathematical methods, subject to approval by the department.

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### GRADUATE PROGRAMS (M.S., PH.D.)

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The department of Applied Mathematics and Statistics at UCSC offers both masters and doctoral degrees within the Statistics and Applied Mathematics (SAM) graduate program, with respective emphasis in statistics (for a degree title in "Statistics and Applied Mathematics") or in applied mathematics (for a degree title in "Applied Mathematics and Statistics"). In addition, the department also offers an independent masters program in "Scientific Computing and Applied Mathematics (SciCAM)."

The goal of the two tracks of the SAM graduate program is to help students develop into independent scholars specialized in statistics or applied mathematics respectively, 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 an excellent further 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 the field related to their undergraduate degree.

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### GRADUATE PROGRAM IN STATISTICS AND APPLIED MATHEMATICS

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#### REQUIREMENTS FOR A GRADUATE DEGREE IN STATISTICS AND APPLIED MATHEMATICS

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This track is for students emphasizing statistics. All students must complete the core courses described below.

#### REQUIRED CORE COURSES:

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- 200 Research and Teaching in Applied Mathematics and Statistics
- 203 Introduction to Probability Theory
- 205B Intermediate Classical Inference
- 206B Intermediate Bayesian Inference
- 207 Intermediate Bayesian Statistical Modeling
- 211 Foundations of Applied Mathematics
- 256 Linear Statistical Models
- 280B Seminar in Statistics and Applied Mathematical Modeling

## Applied Mathematics and Statistics

In addition to these 35 credits, master of science (M.S.) students must complete two additional 5-credit courses from the approved list, for a total requirement of 45 credits; doctor of philosophy (Ph.D.) students must complete four additional 5-credit courses from the approved list, for a total requirement of 55 credits.

### REQUIREMENTS FOR A GRADUATE DEGREE IN APPLIED MATHEMATICS AND STATISTICS

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This track is for students emphasizing Applied Mathematics. All students must complete the core courses described below.

#### REQUIRED CORE COURSES:

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200 Research and Teaching in Applied Mathematics and Statistics

203 Introduction to Probability Theory

211 Foundations of Applied Mathematics

212A Applied Mathematical Methods I

212B Applied Mathematical Methods II

213B Numerical Solutions of Differential Equations

214 Applied Dynamical Systems

280B Seminar in Statistical and Applied Mathematical Modeling

In addition to these 35 credits, master of science (M.S.) students must complete two additional 5-credit courses from the approved list, for a total requirement of 45 credits; doctor of philosophy (Ph.D.) students must complete four additional 5-credit courses from the approved list, for a total requirement of 55 credits.

For both emphasis tracks, M.S. students will be allowed to substitute up to two courses with their required research project in which they conduct a research program in one or two of the quarters of their second year. The project will consist of solving a problem or problems from the selected area of application and will be presented to the sponsoring faculty member as a written document.

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.

#### QUALIFYING EXAMINATIONS

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At the end of the first year, all students will take a pre-qualifying examination covering the six (non-seminar) core courses. This examination will have two parts: an in-class written examination, followed by a take-home project involving data analysis. 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 be dismissed from the program.

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 as part of an oral qualifying examination given by the qualifying committee.

#### THESIS AND/OR DISSERTATION REQUIREMENTS

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A capstone project is required for the M.S. degree and a dissertation for the Ph.D. degree.

For the M.S. degree, students will conduct a capstone research project in their second year (up to three quarters). Students must submit a proposal to the potential faculty sponsor by the start of the fourth academic quarter. 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 individuals, consisting of the faculty adviser and one additional reader. Additional readers will be chosen appropriately from within the Applied Mathematics and Statistics Department or outside of it. Either the adviser or the additional reader must be from within the Applied Mathematics and Statistics Department.

A dissertation is required for the Ph.D. degree. Ph.D. students must select a faculty research adviser by the end of the second year. A written dissertation proposal will be submitted to the adviser, and filed with the graduate secretary. A qualifying examination committee will be formed, consisting of the adviser and three additional members, approved by the Chair of the Graduate Program and the Dean of the Graduate Division. The student will submit the written dissertation proposal to all members of the committee and the graduate secretary no less than one month in advance of the qualifying examination. The dissertation proposal will be 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 all incompletes), passed the qualifying examination, and paid the filing 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

## Applied Mathematics and Statistics

year will be subject to academic probation. Upon advancement to candidacy, a dissertation reading committee will be formed, consisting of the dissertation supervisor and at least two additional readers appointed by the Graduate Program chair upon recommendation of the dissertation supervisor. At least one of these additional readers must be in the Applied Mathematics and Statistics Department. The committee is subject to the approval of the Graduate Division.

The dissertation will consist of a minimum of three chapters composed of material suitable for submission and publication in major professional journals in statistics or applied mathematics. 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.

### RELATIONSHIP OF MASTERS AND DOCTORAL PROGRAMS

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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, and students in the Ph.D. program can receive a 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 statistics and 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.

### TRANSFER CREDIT

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Up to three School of Engineering courses fulfilling the degree requirements of either the M.S. or Ph.D. degrees may be taken before beginning the graduate program through the concurrent enrollment program. Ph.D. students who have previously earned a master's degree in a related field at another institution may substitute courses from their previous university with approval of the adviser and the graduate committee. Courses from other institutions may not 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. At most, a total of three courses may be transferred from concurrent enrollment and other institutions.

### REQUIREMENTS FOR A DESIGNATED EMPHASIS TO AN EXTERNAL DEGREE PROGRAM

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Students from another degree program who meet the following requirements can have the designated emphasis of statistics<sup>2</sup> annotated to their degree title. For example, a Ph.D. student in electrical engineering who meets the requirements would get a certification that read Ph.D. Electrical Engineering (Statistics). The course requirements are:

#### Required Core Courses:

203 Introduction to Probability Theory

206 Classical and Bayesian Inference (or 206B Intermediate Bayesian Inference)

207 Intermediate Bayesian Statistical Modeling

256 Linear Statistical Models

and one other statistics course from a list of approved courses in AMS (currently 202, 205B, 221, 223, 225, 241, 245, 261, 263, 274, and 291).

### GRADUATE PROGRAM IN SCIENTIFIC COMPUTING AND APPLIED MATHEMATICS (SCICAM)

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#### PROGRAM LEARNING OUTCOMES (PLOS)

##### M.S. PLOS:

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1. The ability to take a real-life science or engineering problem, and create a mathematical model of it, under supervision or with the help of discussions with colleagues.
2. Proficiency in analytical methods for the solution of linear algebra problems, ordinary and partial differential equations.
3. Proficiency in the construction of numerical algorithms for the solution of linear algebra problems, as well as ordinary and partial differential equations.
4. Proficiency in at least two scientific computing languages such as: Fortran, C, Python, R, Matlab, etc. Familiarity with Unix-type operating systems, the use of compilers, professional scientific computing libraries, efficient IO algorithms, data visualization tools, etc.
5. Proficiency in the two main parallel computing paradigms (shared vs. distributed memory) and in the use of OpenMP and MPI. Familiarity with parallel architectures and with supercomputing environments such as batch submission scripts, data transfer protocols, scripting, etc.
6. The ability to identify and implement, among all of the methods and languages known, the most

## Applied Mathematics and Statistics

appropriate and efficient approach for the original problem posed.

7. The ability to analyze critically the results from the model obtained, and to present them clearly and coherently to peers (orally and/or in writing).

### Assessment:

The progress of each student towards the PLOs will be monitored by the program faculty through:

- regular formative and summative assessments in the classroom context (participation, homework, quizzes, midterms);
- final examinations or final projects in each of the individual core course;
- the comprehensive capstone requirement (whether thesis or comprehensive exam).

## REQUIREMENTS FOR A GRADUATE DEGREE IN SCIENTIFIC COMPUTING AND APPLIED MATHEMATICS

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### Required core courses and foundational requirements:

209 Foundations of Scientific Computing

212A Applied Mathematical Methods I

213A Numerical Linear Algebra

213B Numerical Solutions of Differential Equations

214 Applied Dynamical Systems

250 Introduction to parallel computing

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: AMS 147 (Computational Methods and Applications), AMS 210 (Foundations of Scientific Computing) and AMS 211 (Foundations of Applied Mathematics).

### Electives and capstone requirements:

**Approved elective courses:** Any regular graduate AMS course not already in the core except AMS 200 and supervised research courses; a list of current allowable electives in other departments is maintained by the graduate director, and updated on a yearly basis. Students may also petition the program to add one or more courses to the elective list. 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.

Students in the SciCAM program may pursue a Plan I (thesis capstone) or a Plan II (comprehensive examination capstone) curriculum.

Candidates for a Plan I capstone must, in addition to the 25 credits required from core courses, (1) complete one additional 5-credit course from the approved elective list, (2) complete 10 credits of supervised research (in the form of AMS 297 or AMS 298 with one of the program faculty), and (3) 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 at least two faculty from the AMS Department, one of which must be the student's adviser. 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 M.S. degree to the student.

Candidates for a Plan II capstone must, in addition to the 25 credits required from core courses, (1) complete three additional 5-credit courses from the approved elective list, and (2) successfully pass the SciCAM comprehensive examination. The latter 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 project covering all core and foundational courses.

### Accelerated 1-Year Program Plan

The expected time to completion of the SciCAM degree program is two years. However, AMS also offers a one-year accelerated track for interested students who can demonstrate sufficient proficiency in the foundational subjects. Information on the minimum requirements to join the accelerated track can be found on the program web site. Requests to join the accelerated track must be made to the graduate director by e-mail no later than August 31 of each year.

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## RELATIONSHIP OF SCICAM MASTERS PROGRAM AND AMS DOCTORAL PROGRAM

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Students in the SciCAM M.S. program interested in an academic career will be strongly encouraged to apply to the SAM Ph.D. program. Applications are reviewed in the standard academic cycle, so that students interested in applying to the SAM program are encouraged to discuss this option with the graduate director in the fall of each year.

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### TRANSFER CREDIT

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Up to three UCSC courses fulfilling the degree requirements of the SciCAM degree may be taken before beginning the graduate program.

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.

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### REVIEW OF PROGRESS

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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). For specific guidelines on the annual student reviews, please refer to <http://www.soe.ucsc.edu/programs/ssm/graduate/index.html>.

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## APPLIED MATHEMATICS AND STATISTICS FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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#### **Nicholas Brummell**

Fluid dynamics; magnetohydrodynamics; numerical simulations of geophysical and astrophysical dynamics, especially solar interior physics; supercomputing

#### **David Draper**

Bayesian inference, prediction and decision-making; hierarchical modeling; Bayesian non-parametric methods; model specification and model uncertainty; Bayesian data science; accurate Bayesian computations with massive data; quality assessment; risk assessment; statistical applications in the environmental, medical, and social sciences

#### **Pascale Garaud**

Astrophysical and geophysical fluid dynamics, magnetohydrodynamics; analytical and numerical solutions of partial differential equations related to these phenomena

#### **Athanasios Kottas**

Bayesian nonparametrics, mixture models, modeling and inference for point processes, nonparametric regression, survival analysis, applications in biometrics, ecology, and the environmental sciences

#### **Herbert Lee**

Bayesian statistics, computer simulation experiments, spatial statistics, inverse problems, model selection and model averaging, nonparametric regression, neural networks, classification and clustering

#### **Marc Mangel, Emeritus**

#### **Raquel Prado**

Bayesian non-stationary time series modeling, multivariate time series, biomedical signal processing and statistical genetics

#### **Abel Rodriguez**

Bayesian nonparametrics, Bayesian time series and spatial models, machine learning, document modeling, public health, financial econometrics, structural proteomics, genomics

#### **Bruno Sanso**

Bayesian spatio-temporal modeling, environmental and geostatistical applications, modeling of extreme values, statistical assessment of climate variability

#### **Hongyun Wang**

Single molecule studies and biophysics, statistical physics, stochastic processes and stochastic differential equations, classical analysis; numerical analysis

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### ASSOCIATE PROFESSOR

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#### **Qi Gong**

Computational methods for real-time control systems, trajectory optimization and motion planning, nonlinear filtering and observer design, robust and adaptive control of nonlinear systems, industry applications of control theory

ASSISTANT PROFESSOR

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**Rajarshi Guhaniyogi**

Areal wombling, compressive methods for high dimensional regression, multi-linear modeling, manifold regression, nonparametric bayes, online learning with massive streaming data, spatial bayes modeling for massive geostatistical datasets, Bayesian tensor regression. applications in epidemiology, forestry, genomics, neuroscience and several other machine learning applications

**Dongwook Lee**

Computational magnetohydrodynamics and gas dynamics; computational mathematics for large-scale scientific computing on high-performance parallel architectures; numerical algorithms for finite-volume, high-order shock capturing methods; Newton-Krylov-type iterative implicit solvers for stiff nonlinear system; nonlinear numerical methods for astrophysics and high-energy-density physics applications

**Ju Hee Lee**

Bayesian statistics, bayesian nonparametrics, modeling in biosciences and clinical trials

**Daniele Venturi**

Uncertainty Quantification (UQ) and computational probability, multi-fidelity stochastic modeling and data-driven stochastic multiscale mathematics, numerical analysis and high-performance scientific computing, probability density function methods for forward and inverse UQ problems, Mori-Zwanzig approach to dimension reduction and uncertainty quantification, functional differential equations

ASSOCIATE ADJUNCT PROFESSOR

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**Robin Morris**

Statistics and machine learning on massive datasets for recommendation systems, text and image classification, and web traffic analysis

VISITING ASSISTANT PROFESSOR

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**Tatiani Xifara**

Bayesian and computational statistics, hidden Markov models, adaptive MCMC and MALA algorithms, statistical ecology

LECTURER

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**Yonatan Katznelson**

Number theory

**Bruno Mendes**

Parameter and model uncertainty in geophysics and groundwater contamination modeling, Bayesian statistics, parallel computation



**Douglas Bonett (Psychology)**

Psychometrics and statistics

**William Dunbar (Computer Engineering)**

Theory and application of feedback control, single-molecule biophysics, nanopore sensors, dynamics and control of biomolecules

**Gabriel Elkaim (Computer Engineering)**

Embedded systems; robust software architectures for real-time reactive systems; sensor fusion; guidance, navigation, and control (GNC) system identification; robust and advanced control schemes; feedback control systems; robotics; unmanned autonomous vehicles (UAVs); and cooperative control

**Andrew T. Fisher (Earth Sciences)**

Hydrogeology, crustal studies, coupled flows, modeling

**Lise Getoor (Computer Science)**

Machine learning, reasoning under uncertainty, analysis of graphs and networks, artificial intelligence, databases, information integration, visual analytics, data science

**Gary A. Glatzmaier (Earth Sciences)**

Computer simulation of geodynamics and planetary dynamics

**David Haussler (Biomolecular Engineering)**

Bioinformatics, genomics, computational genomic data analysis, molecular evolution and comparative genomics, genomic and clinical data sharing and standards, cancer genomics, neurodevelopment, stem cell research, immunogenomics, information theory, pattern recognition, machine learning, artificial intelligence, information theory, theoretical computer science

**David P. Helmbold (Computer Science)**

Machine learning, computational learning theory, analysis of algorithms

**Roberto Manduchi (Computer Engineering)**

Computer vision and sensor processing, with application to assistive technology for the visually impaired, mobile and pervasive computing

**Richard Montgomery (Mathematics)**

Celestial mechanics, differential geometry, gauge theory, mechanics (quantum and classical), and control theory

**Katia Obraczka (Computer Engineering)**

Computer networks, distributed systems, operating systems, Internet information systems, mobile computing, wireless networks

**Hamid Sadjadpour (Computer Engineering)**

Wireless communication systems, network information theory and scaling laws, performance analysis of wireless ad hoc and sensor networks, routing and MAC protocol design for wireless networks

**Manfred Warmuth (Computer Science)**

Online learning, machine learning, statistical decision theory, game theory, analysis of algorithms

**A. Peter Young, Emeritus (Physics)**

**Yi Zhang (Technology Management)**

Large-scale information retrieval, recommendation systems, Internet advertising, data mining, natural language processing, and applied machine learning

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## APPLIED MATHEMATICS AND STATISTICS COURSES

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### LOWER-DIVISION COURSES

**3. Precalculus for Science and Engineering. F,W**

Includes inequalities, linear and quadratic equations, functions (linear, quadratic, rational, power, exponential, logarithms, trigonometric), and analytic geometry, with application to science and engineering. Students cannot receive credit for both this course and Mathematics 3. Mathematics 3 can substitute for course 3. Prerequisite(s): score of 200 or higher on the mathematics placement examination (MPE), or Mathematics 2. (General Education Code(s): MF, Q.) The Staff, P. Garaud, B. Mendes

**5. Statistics. F,W,S**

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 course 7. (General Education Code(s): SR, IN, Q.) The Staff, H. Lee, A. Kottas, R. Morris, B. Mendes, J. Katznelson, A. Rodriguez, B. Sanso

**6. Precalculus for Statistics.**

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 course 2, Pre-Statistics.) Prerequisite(s): Mathematics 2 or mathematics placement examination (MPE) score of 200 or higher or higher. (General Education Code(s): MF, Q.) B. Mendes, The Staff

**7. Statistical Methods for the Biological, Environmental, and Health Sciences. F,W,S**

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 Statistical Methods for the Biological and Environmental Sciences.) Prerequisite(s): score of 300 or higher on the mathematics placement examination (MPE), or course 2 or 3 or 6 or 11A or 15A or Mathematics 3 or 11A or 19A. Concurrent enrollment in course 7L is required. (General Education Code(s): SR, IN, Q.) The Staff, H. Lee, A. Rodriguez, J. Lee, D. Draper, R. Prado

**7L. Statistical Methods for the Biological, Environmental, and Health Sciences Laboratory (2 credits). F,W,S**

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 Statistical Methods for the Biological and Environmental Sciences Laboratory.) Prerequisite(s): score of 300 or higher on the mathematics placement examination (MPE), course 2 or 3 or 6 or 11A or 15A or Mathematics 3 or 11A or 19A. Concurrent enrollment in course 7 is required. H. Lee, R. Prado, J. Lee, A. Rodriguez, D. Draper

**10. Mathematical Methods for Engineers I. F,S**

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

## Applied Mathematics and Statistics

this course and for courses 10A or Mathematics 21. Prerequisite(s): score of 400 or higher on the mathematics placement examination (MPE), or course 3, or Mathematics 3. (General Education Code(s): MF, Q.) The Staff, H. Wang, Q. Gong, J. Katznelson, N. Brummell, B. Mendes

### **10A. Basic Mathematical Methods for Engineers I (3 credits). F,S**

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. Students cannot receive credit for this course and courses 10 or Mathematics 21. Prerequisite(s): score of 400 or higher on the mathematics placement examination (MPE), or course 3, or Mathematics 3. The Staff, H. Wang, Q. Gong, J. Katznelson, N. Brummell, B. Mendes

### **10B. Mathematical Methods for Engineers IB (2 credits).**

Can only be taken by students who need a transition from course 10A to course 10. Students cannot receive credit for this course and for course 10 or Mathematics 21. Prerequisite(s): course 10A. Enrollment by permission of instructor only. The Staff

### **11A. Mathematical Methods for Economists I. F,W,S**

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 Mathematics

11A or 19A or Applied Mathematics and Statistics 15A. (Also offered as Applied Mathematics and Statistics 11A. Students cannot receive credit for both courses.) (Also offered as Economics 11A. Students cannot receive credit for both courses.) Students who have already taken Mathematics 11A or 19A should not take this course. Prerequisite(s): score of 300 or higher on the mathematics placement examination (MPE), Applied Math and Statistics 2, 3, or 6, or Mathematics 3. (General Education Code(s): MF, IN, Q.) J. Katznelson, B. Mendes

### **11B. Mathematical Methods for Economists II. F,W,S**

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 Mathematics 11B or 19B or Applied Math and Statistics 15B. (Also offered as Economics 11B. Students cannot receive credit for both courses.) Prerequisite(s): course 11A, Economics 11A, Mathematics 11A, or Mathematics 19A. (General Education Code(s): MF, IN, Q.) J. Katznelson

### **15A. Case-Study Calculus I.**

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 course 11A or Economics 11A or Mathematics 11A or 19A. Prerequisite(s): course 3 or Mathematics 3 or score of 300 or higher on the mathematics placement examination (MPE) or by permission of instructor. (General Education Code(s): MF, IN, Q.) P. Garaud, B. Mendes

### **15B. Case-Study Calculus II.**

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 course 11B or Economics 11B or Mathematics 11B or 19B. Prerequisite(s): course 15A or 11A or Economics 11A or Mathematics 11A or 19A. (General Education Code(s): MF, IN, Q.) The Staff, P. Garaud, B. Mendes

### **20. Mathematical Methods for Engineers II. W,S**

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 courses 20A or Mathematics 24. Prerequisite(s): Mathematics 19B, and course 10 or 10A or Mathematics 21. (General Education Code(s): MF.) J. Katznelson, D. Lee, Q. Gong

### **20A. Basic Mathematical Methods for Engineers II (3 credits). W,S**

Applications-oriented class on ordinary differential equations (ODEs) and systems of ODEs integrating Matlab as a computational support tool. Covers linear ODEs and systems of linear ODEs; nonlinear ODEs using substitution and Laplace transforms. Students cannot receive credit for this course and for courses 20 or Mathematics 24. Prerequisite(s): Mathematics 19B, and course 10 or 10A or Mathematics 21. J. Katznelson, D. Lee, Q. Gong

### **20B. Mathematical Methods for Engineers IIB (2 credits).**

Can only be taken by students who need a transition from course 20A to course 20. Students cannot receive credit for this course and for course 20 or Mathematics 24. Prerequisite(s): course 20A. Enrollment by permission of instructor only. The Staff

### **80A. Gambling and Gaming. F,W**

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. (General Education Code(s): SR, T7-Natural Sciences or Social Sciences, Q.) H. Lee, A. Kottas, R. Guhaniyogi, A. Rodriguez, B. Mendes

### **80B. Data Visualization. S**

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. (General Education Code(s): SR.) A. Rodriguez

## **UPPER-DIVISION COURSES**

### **100. Mathematical Methods for Engineers III.**

Applications-oriented course on complex analysis and partial differential equations using Maple as symbolic math software support. In addition, introduces Fourier analysis, special functions, and asymptotic methods. Students cannot receive credit for this course and Physics 116B or Physics 116C. Prerequisite(s): course 20, or by permission of instructor. Enrollment limited to 25. The Staff

### **107. Introduction to Fluid Dynamics. F**

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 Applied Mathematics and Statistics 217. (Also offered as Physics 107. Students cannot receive credit for both courses.) Prerequisite(s): Mathematics 107 or Physics 116C or Earth and Planetary Sciences 111. N.

Brummell, The Staff

### **114. Introduction to Dynamical Systems. W**

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 course 214. (Formerly course 146.) Prerequisite(s): course 20 or 20A, or Mathematics 21 and Mathematics 24, or Physics 116B. Enrollment restricted to sophomores, juniors and seniors. (General Education Code(s): MF.) P. Garaud, D. Milutinovic, Q. Gong

### **115. Stochastic Modeling in Biology.**

Application of differential equations, probability, and stochastic processes to problems in cell, organismal, and population biology. Topics include life-history theory, behavioral ecology, and population biology. Students may not receive credit for this course and course 215. Prerequisite(s): course 131, a university-level course in biology, and operational knowledge of a programming language; or consent of instructor. The Staff

### **131. Introduction to Probability Theory. F**

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 course 203 and Computer Engineering 107. Prerequisite(s): course 11B or Economics 11B or

Mathematics 11B or 19B. (General Education Code(s): SR, Q.) R. Prado, D. Draper, B. Sanso, A. Kottas

**132. Classical and Bayesian Inference. W**

Introduction to statistical inference at a calculus-based level: maximum likelihood estimation, sufficient statistics, distributions of estimators, confidence intervals, hypothesis testing, and Bayesian inference. Students cannot receive credit for this course and course 206. (Formerly Statistical Inference.) Prerequisite(s): course 131 or Computer Engineering 107. (General Education Code(s): SR.) R. Prado, A. Kottas, A. Rodriguez, D. Draper, J. Lee

**147. Computational Methods and Applications. W**

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. Prerequisite(s): course 10 or 10A, or Mathematics 21. Knowledge of differential equations is recommended (course 20 or 20A, or Mathematics 24). (General Education Code(s): MF.) H. Wang

**156. Linear Regression.**

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 Linear Statistical Models.) Prerequisite(s): course 132 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 30. (General Education Code(s): W.) H. Lee

**198. Independent Study or Research. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**198F. Independent Study or Research (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**GRADUATE COURSES**

**200. Research and Teaching in AMS (3 credits). F**

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. Enrollment restricted to graduate students. A. Kottas, The Staff

**202. Linear Models in SAS.**

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. Prerequisite(s): course 156 or 256, or permission of instructor. Enrollment restricted to graduate students. B. Mendes

**203. Introduction to Probability Theory. F**

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 course 131 or Computer Engineering 107. Enrollment restricted to graduate students, or by permission of the instructor. R. Prado, B. Sanso, A. Kottas

**205B. Intermediate Classical Inference. W**

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 Statistical Inference.) Prerequisite(s): course 203 or equivalent. Enrollment restricted to graduate students. B. Sanso, R. Guhaniyogi, D. Draper

**206. Classical and Bayesian Inference. W**

Introduction to statistical inference at a calculus-based level: maximum likelihood estimation, sufficient statistics, distribution of estimators, confidence intervals, hypothesis testing, and Bayesian inference. Students cannot receive credit for this course and course 132. (Formerly Bayesian Statistics.) Prerequisite(s): course 203. Enrollment restricted to graduate students; undergraduates may enroll by permission of instructor. H. Lee, D. Draper, A. Kottas, R. Prado

**206B. Intermediate Bayesian Inference. W**

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.

Prerequisite(s): course 203.

Enrollment restricted to graduate students; undergraduates may enroll by permission of instructor.

R. Prado, A. Rodriguez, J. Lee

**207. Intermediate Bayesian Statistical Modeling. S**

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. Prerequisite(s): courses 206 or 206B; enrollment restricted to graduate students or by permission of instructor. R. Prado, D. Draper, B. Sanso

**209. Foundations of Scientific Computing. F**

Covers the fundamental aspects of scientific computing for research. Introduces algorithmic development; programming (including the use of compilers, libraries, debugging, optimization, and code publication); computational infrastructure; and data-analysis tools. Students gain hands-on experience through practical assignments. Enrollment is restricted to graduate students. Undergraduates may enroll with the permission of the instructor. D. Lee, N. Brummell

**211. Foundations of Applied Mathematics. F**

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. Enrollment restricted to graduate students. N. Brummell, J. Katznelson

**212A. Applied Mathematical Methods I. W**

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. Course 211 or equivalent is strongly recommended as preparation. Enrollment restricted to graduate students. Undergraduates are encouraged to take this class with permission of instructor. H. Wang, N. Brummell, P. Garaud

**212B. Applied Mathematical Methods II. S**

Covers perturbation methods: asymptotic series, stationary phase and expansion of integrals, matched asymptotic expansions, multiple scales and the WKB method, Padé approximants and improvements of series. (Formerly course 212.) Prerequisite(s): course 212A. H. Wang, N. Brummell, P. Garaud

**213. Numerical Solutions of Differential Equations.**

Teaches basic numerical methods for numerical linear algebra and, thus, the solution of ordinary differential equations (ODEs) and partial differential equations (PDEs). Covers LU, Cholesky, and

QR decompositions; eigenvalue search methods (QR algorithm); singular value decomposition; conjugate gradient method; Runge-Kutta methods; error estimation and error control; finite differences for PDEs; stability, consistency, and convergence. Basic knowledge of computer programming is needed. Enrollment restricted to graduate students or permission of instructor. H. Wang, Q. Gong, N. Brummell, P. Garaud

**213A. Numerical Linear Algebra. W**

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. (W) Q. Gong, (W) The Staff

**213B. Numerical Methods for the Solution of Differential Equations. S**

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. Enrollment is restricted to graduate students. D. Lee

#### **214. Applied Dynamical Systems. W**

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 course 114. Enrollment restricted to graduate students. Enrollment of undergraduates by permission of instructor. Enrollment limited to 15. P. Garaud, D. Milutinovic, Q. Gong

#### **215. Stochastic Modeling in Biology.**

Application of differential equations and probability and stochastic processes to problems in cell, organismal, and population biology. Topics include: life-history theory, behavioral ecology, and population biology. Students may not receive credit for this course and course 115. Enrollment restricted to graduate students or permission of instructor. The Staff

#### **216. Stochastic Differential Equations.**

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. Enrollment restricted to graduate students or consent of instructor. H. Wang

#### **217. Introduction to Fluid Dynamics. F**

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 course 107. Enrollment restricted to graduate students. N. Brummell, The Staff

#### **221. Bayesian Decision Theory. S**

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. Prerequisite(s): course 206. Enrollment restricted to graduate students. D. Draper, B. Sanso

#### **223. Time Series Analysis.**

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. Prerequisite(s): course 206B, or by permission of instructor. Enrollment restricted to graduate students. R. Prado

#### **225. Multivariate Statistical Methods. F**

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. Prerequisite(s): course 206 or 206B, or by permission of instructor. Enrollment restricted to graduate students. D. Draper, J. Lee

#### **227. Waves and Instabilities in Fluids. W**

Advanced fluid dynamics course introducing various types of small-amplitude waves and instabilities that commonly arise in geophysical and astrophysical systems. Topics covered include, but are not limited to: pressure waves, gravity waves, Rossby waves, interfacial instabilities, double-diffuse instabilities, and centrifugal instabilities. Advanced mathematical methods are used to study each topic. Undergraduates are encouraged to take this course with permission of the instructor. Prerequisite(s): courses 212A and 217. P. Garaud

#### **231. Nonlinear Control Theory. S**

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. Prerequisite(s): basic knowledge of mathematical analysis and ordinary differential equations is assumed.

Enrollment restricted to graduate students or permission of instructor. Q. Gong

**232. Applied Optimal Control.**

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. Prerequisite(s): course 114 or 214, or Computer Engineering 240 or 241, or Mathematics 145. Enrollment restricted to graduate students. Q. Gong

**236. Motion Coordination of Robotic Networks.**

Comprehensive introduction to motion coordination algorithms for robotic networks. Emphasis on mathematical tools to model, analyze, and design cooperative strategies for control, robotics, and sensing tasks. Topics include: continuous and discrete-time evolution models, proximity graphs, performance measures, invariance principles, and coordination algorithms for rendezvous, deployment, flocking, and consensus. Techniques and methodologies are introduced through application setups from multi-agent robotic systems, cooperative control, and mobile sensor networks. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

**241. Bayesian Nonparametric Methods. F**

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. Prerequisite(s): course 207. Enrollment restricted to graduate students. A. Rodriguez, A. Kottas

**245. Spatial Statistics.**

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. Prerequisite(s): course 207. Enrollment restricted to graduate students. B. Sanso, H. Lee

**250. An Introduction to High Performance Computing. S**

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. Enrollment is restricted to graduate students. Undergraduates may enroll with permission of instructor. D. Lee, N. Brummell

**256. Linear Statistical Models. S**

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. Course 205 strongly recommended as a prerequisite. Undergraduates are encouraged to take this class with permission of instructor. Prerequisite(s): course 205A or 205B or permission of instructor. Enrollment restricted to graduate students. The Staff, R. Prado, A. Rodriguez, B. Sanso, J. Lee

**260. Computational Fluid Dynamics.**

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. Prerequisite(s): Basic knowledge of computer programming languages is assumed. Enrollment is restricted to graduate students. N. Brummell

**261. Probability Theory with Markov Chains. W**

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. Prerequisite(s): course 205B or by permission of instructor. Enrollment restricted to graduate students. A. Kottas

**263. Stochastic Processes.**

Includes probabilistic and statistical analysis of random processes, continuous-time Markov chains, hidden Markov models, point

## Applied Mathematics and Statistics

processes, Markov random fields, spatial and spatio-temporal processes, and statistical modeling and inference in stochastic processes. Applications to a variety of fields. Prerequisite(s): course 205A, 205B, or 261, or by permission of instructor. A. Rodriguez, A. Kottas

### **274. Generalized Linear Models. S**

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. Prerequisite(s): course 205A, 205B, or 256. Enrollment restricted to graduate students. A. Kottas, The Staff

### **280A. Seminar in Mathematical and Computational Biology (2 credits).**

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. Enrollment restricted to graduate students. Enrollment limited to 20. May be repeated for credit. The Staff

### **280B. Seminars in Statistical and Applied Mathematical Modeling (2 credits). F,W,S**

Weekly seminar series covering topics of current research in applied mathematics and statistics. Permission of instructor required. Enrollment restricted to graduate students. (Formerly Seminar in Applied Mathematics and Statistics.) May be repeated for

credit. The Staff

### **280C. Seminar in Geophysical and Astrophysical Fluid Dynamics (2 credits). F,W,S**

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. Enrollment restricted to graduate students. May be repeated for credit. N. Brummell, P. Garaud

### **280D. Seminar in Bayesian Statistical Methodology (2 credits). S**

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. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **285. Seminar in Career Skills (2 credits).**

Seminar in career skills for applied mathematicians and statisticians. Learn about professional activities such as the publication process, grant proposals, and the job market. Enrollment restricted to graduate students, typically within two years of their expected Ph.D. completion date. The Staff

### **290A. Topics in Mathematical and Computational Biology (2 credits).**

Focuses on applications of mathematical and computational methods with particular emphasis on advanced methods applying to organismal biology or resource

management. Students read current literature, prepare critiques, and conduct projects. Enrollment restricted to graduate students. Enrollment limited to 20. May be repeated for credit. The Staff

### **290B. Advanced Topics in the Numerical Solution of PDEs.**

Modern practical methods for the numerical solution of partial differential equations. Methods considered depend on the expertise of the instructor, but are covered in-depth and up to the cutting-edge of practical contemporary implementation. Content could be method-based (e.g., spectral methods, finite-element methods) or topic-based (e.g., simulations of turbulence). Some programming and numerical analysis (e.g., course 213) highly recommended. Enrollment restricted to graduate students and undergraduates with permission of the instructor. H. Wang, N. Brummell, P. Garaud

### **291. Advanced Topics in Bayesian Statistics (3 credits).**

Advanced study of research topics in the theory, methods, or applications of Bayesian statistics. The specific subject depends on the instructor. Enrollment restricted to graduate students and by permission of instructor. May be repeated for credit. The Staff

### **296. Masters Project (2 credits). F,W,S**

Independent completion of a masters project under faculty supervision. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**297. Independent Study or Research. F,W,S**

Independent study or research under faculty supervision. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. The Staff

**297F. Independent Study (2 credits). F,W,S**

Independent study or research under faculty supervision. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**299. Thesis Research. F,W,S**

Thesis research under faculty supervision. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. The Staff

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# BIOENGINEERING

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2015-16 General Catalog

Baskin School of Engineering  
335 Baskin Engineering Building  
(831) 459-2158  
<http://www.beng.soe.ucsc.edu>

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## PROGRAM DESCRIPTION

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The four concentrations of the UCSC bachelor of science (B.S.) degree in bioengineering prepare graduates for productive employment in industry or further education in graduate school. Each concentration is based on different essential underlying science, but all share an emphasis on teaching engineering design using that basis in science.

The biomolecular engineering 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 bioelectronics concentration is designed for students interested in the interface between organisms and electronic instrumentation or implants. The emphasis is on the interfacing of biological sensors to computer systems, and the underlying sciences are physics and chemistry.

The assistive technology: motor concentration is designed for students interested in helping people with movement disabilities. The emphasis is on designing exoskeletons and robots, and the underlying sciences are physics and anatomy.

The assistive technology: cognitive/perceptual concentration is designed for students interested in helping people with cognitive or perceptual disabilities. The emphasis is on designing computer systems that help people compensate for disabilities, and the underlying sciences are psychology and computer science.

In all four concentrations, students participate in a capstone design experience: a two-quarter group project intended to prepare students for work in industry, a summer full-time synthetic biology project based on the iGEM competition, or a three-quarter senior thesis intended to prepare students for Ph.D. research. All 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 on the web at [ugr.ucsc.edu](http://ugr.ucsc.edu), [beng.soe.ucsc.edu](http://beng.soe.ucsc.edu), [cbse.ucsc.edu](http://cbse.ucsc.edu), [biomedical.ucsc.edu](http://biomedical.ucsc.edu), [marcmbrs.ucsc.edu](http://marcmbrs.ucsc.edu), [surf-it.soe.ucsc.edu](http://surf-it.soe.ucsc.edu), and [stemdiv.ucsc.edu/ucleads/](http://stemdiv.ucsc.edu/ucleads/).

The program is sponsored by the Departments of Biomolecular Engineering, Computer Engineering, Electrical Engineering, and Molecular, Cell, and Developmental Biology, with additional participating faculty in the Departments of Applied Mathematics and Statistics, Chemistry and Biochemistry, and Psychology.

The program has course requirements in mathematics, science, and engineering. Students interested in bioengineering as a major should contact the School of Engineering advising office ([advising@soe.ucsc.edu](mailto:advising@soe.ucsc.edu)) before enrolling in any courses at UCSC. Early advising is particularly important before choosing calculus and physics courses.

Bioengineering students may continue their research and studies at UCSC in any of several graduate programs. Information may be found at <http://www.graddiv.ucsc.edu>.

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## PROGRAM LEARNING OUTCOMES

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A bioengineering student completing the program should:

- have a broad knowledge of science and engineering disciplines including biology, chemistry, physics, mathematics, statistics, and computer science;
- be able to apply their broad knowledge to identify, formulate, and solve engineering design problems;

## Bioengineering

- 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 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.

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### COURSES FOR NONMAJORS

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The following courses are recommended for nonmajors interested in bioengineering. Computer Engineering 80A, Universal Access: Disability, Technology, and Society; Biomolecular Engineering 80G, Bioethics in the 21st Century: Science, Business, and Society; and Biomolecular Engineering 5, Introduction to Biotechnology. Students are also advised to consult the program discussions of the collaborating departments for additional possibilities related to bioengineering.

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### DECLARATION OF THE MAJOR

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To be admitted by the end of the 5th quarter, students need to have taken 50 credits from the following list of courses with a GPA of 2.8 or better:

Applied Mathematics and Statistics (AMS) 7/L, AMS 10, AMS 20, Molecular, Cell, and Developmental Biology (BIOL) 20A, Ecology and Evolutionary Biology (BIOE) 20B, Biomolecular Engineering (BME) 5, BME 80G, Chemistry and Biochemistry (CHEM) 1A, CHEM 1B/M, CHEM 1C/N, CHEM 108A/L, CHEM 108B/M, Computer Engineering (CMPE) 9, CMPE 12/L, CMPE 13/L, CMPE 80A, CMPE 100/L, Computer Science (CMPS) 12A/L, CMPS 12B/M, Mathematics (MATH) 19A, MATH 19B, MATH 22 or MATH 23A, Physics (PHYS) 5A/L (or 6A/L), PHYS 5B/M (or 6B/M), PHYS 5C/N (or 6C/N), and Psychology (PSYC) 20A.

Students changing majors after the 6th quarter will need to have completed 10 more credits of required courses in the major for each additional quarter past the 6th quarter.

Appeals for major declaration may be filed with the Baskin School of Engineering Office of Undergraduate Affairs by the end of the fifth week of each regular quarter for faculty review. Determinations will be made by the end of the seventh week of the quarter. After the campus major declaration deadline, students submitting an appeal must have a declared alternate major.

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### TRANSFER STUDENTS

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Transfer students need to have completed eight transferable courses from the list used for admission for on-campus students, with a GPA in those courses of 2.8 or better. However, students are recommended to complete at least ten transferable courses prior to transfer, as they may otherwise have difficulty finishing in a timely fashion.

Students may satisfy the bioethics requirement if they have completed a suitable ethics course at their community college.

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### HONORS IN THE MAJOR

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Bioengineering majors are considered for “Honors in the Major” and “Highest Honors in the Major” based on their GPA and on the results of undergraduate research. Students with a GPA of 3.7 receive “Highest Honors in the Major.” Students with a GPA of 3.3 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.

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### LETTER GRADE POLICY

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Please refer to the letter grade policy in the [School of Engineering](#) section.

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### BASKIN SCHOOL OF ENGINEERING POLICIES

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Please refer to the [School of Engineering](#) section of the catalog for additional policies that apply to all Baskin School of Engineering programs.

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### MATERIALS FEE AND MISCELLANEOUS FEES

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Please see the section on fees in the [School of Engineering](#) section.

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### MAJOR REQUIREMENTS

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#### ADVISING AND ELECTIVE APPROVAL

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Every major must have a bioengineering faculty adviser, assigned by the Baskin School of Engineering undergraduate advising office. With assistance from the adviser, students must formulate a program of proposed course work that meets the major requirements. All electives must be pre-approved by the faculty adviser or bioengineering undergraduate director.

## Bioengineering

### OPTIONAL COURSES FOR MAJORS

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Biomolecular Engineering 88A, BMES Freshman Design Seminar, is recommended for first-year students interested in learning to think like engineers. Students considering the assistive technology: motor concentration or desiring an early introduction to the use of mathematics in engineering may wish to take Computer Engineering 8, Robot Automation, in their first quarter.

#### **Courses required for all concentrations (lower-division, 7):**

Mathematics 19A-B, Calculus for Science, Engineering, and Mathematics

Biomolecular Engineering 80G, Bioethics in the 21st Century: Science, Business, and Society

Chemistry and Biochemistry 1A, 1B/M General Chemistry

Biology (BIOL) 20A, Cell and Molecular Biology

Biology (BIOE) 20B, Development and Physiology

All concentrations also require physics and computer programming, but the details of the requirements differ, due to the different needs of the concentrations (see below).

#### **Courses required for all concentrations (upper-division, 4):**

Biomolecular Engineering 101/L, Applied Circuits for Bioengineers

Computer Engineering 185, Technical Writing or Biomolecular Engineering 185, Technical Writing

Applied Mathematics and Statistics 131, Introduction to Probability Theory

Applied Mathematics and Statistics 132, Classical and Bayesian Inference

#### **Capstone requirement, all concentrations, 2-3 courses**

All bioengineering students complete a senior capstone project in bioengineering, either as a group project or as an individual senior thesis doing research in a faculty laboratory. (Satisfies the campus comprehensive requirement.)

Note that the Technical Writing requirement is a prerequisite for all the capstone options, including the senior thesis. The group project courses all have additional prerequisites that may not be met with just the required courses in a concentration. Students are responsible for ensuring that they meet the prerequisites for whichever capstone they choose.

Most students in the Assistive Technology: Cognitive/Perceptual concentration will need to do a

senior thesis, because of the number of additional prerequisites they would need to take for any of the group project courses.

#### **Capstone Sequences**

Biomolecular Engineering 123A-B, Bioengineering Project; or

Computer Engineering, or Electrical Engineering 129A-C, Capstone Project; or

BME 180, Professional Practice in Bioengineering (2 credits), and BME 188, Synthetic Biology—Mentored Research (10 credits); or

Fifteen credits of independent study (198), Field Study (193), or senior thesis research (195), in biomolecular engineering, computer engineering, or electrical engineering; and Biomolecular Engineering 123T, Senior Thesis Presentation (2 credits).

Students pursuing the senior thesis option must seek approval of their project one year before graduation, typically spring quarter of the third year. Students spend three or more quarters working on their thesis projects. Thesis students must enroll in 123T, Senior Thesis Presentation, before completing their thesis.

#### **Additional required courses for Biomolecular concentration (16 courses)**

Biomolecular Engineering 5, Introduction to Biotechnology

Physics 5A/L or 6A/L, Introduction to Physics I or Introductory Physics I

Physics 5C/N or 6C/N, Introduction to Physics III or Introductory Physics III

Chemistry 1C/N, General Chemistry

Chemistry 108A/L, Organic Chemistry

One of two three-course sequences in biochemistry or molecular biology. The first sequence is intended for students primarily interested in the design of proteins, while the second is intended for students interested in cellular engineering.

Chemistry 108B/M, Organic Chemistry; Biochemistry and Molecular Biology (BIOC) 100A-B; and Biology (BIOL) 101L, Molecular Biology Laboratory; or

Biology (BIOL) 100, Biochemistry; Biology (BIOL) 101/L, Molecular Biology and Biochemistry Laboratory; and one of Biology 110L, Cell Biology Laboratory; 115L, Eukaryotic Molecular Biology Laboratory; or 120L, Development Laboratory

One of three introductions to programming:

- Computer Science 12A/L, Introduction to Programming/Laboratory; or Computer Science 5J, Introduction to Programming in Java and 11,

## Bioengineering

Intermediate Programming; or Computer Engineering 12/L, Computer Systems and Assembly Language/Laboratory and Computer Engineering 13/L, Computer Systems and C Programming/Laboratory

- Biomolecular Engineering 160/L, Research Programming in the Life Sciences

Biomolecular Engineering 110, Bioinformatics Tools

Biology (BIOL) 105, genetics

Biomolecular Engineering 150, Molecular Biomechanics

One of Biology 110, Cell Biology; Biology 115, Eukaryotic Molecular Biology; or Microbiology and Environmental Toxicology 119, Microbiology.

Design elective from Baskin School of Engineering.

Upper-division elective from Baskin School of Engineering or Division of Physical and Biological Sciences.

### **Additional required courses for Bioelectronics concentration (16 courses)**

Chemistry 1C/N, General Chemistry

Physics 5A/L, 5B/M, and 5C/N, Introduction to Physics I, II, and III

Mathematics 23A, Vector Calculus; or Mathematics 22, Introduction to Calculus of Several Variables

Applied Mathematics and Statistics 10, Mathematical Methods for Engineers I

Applied Mathematics and Statistics 20, Mathematical Methods for Engineers II

Computer Engineering 12/L, Computer Systems and Assembly Language/Laboratory

Computer Engineering 13/L, Computer Systems and C Programming/Laboratory

Computer Engineering 100/L, Logic Design/Laboratory

Electrical Engineering 101/L, Introduction to Electronic Circuits/Laboratory

Electrical Engineering 103/L, Signals and Systems/Laboratory

Computer Engineering 167/L, Sensing and Sensor Technologies/Laboratory

Electrical Engineering 171/L, Analog Electronics/Laboratory

Biomolecular Engineering 140, Bioinstrumentation

One upper-division computer or electrical engineering elective approved by the faculty adviser

### **Additional required courses for Assistive Technology: Motor concentration (16 courses)**

Computer Engineering 80A, Universal Access: Disability, Technology, and Society, or Computer

Engineering 8, Robot Automation: Intelligence Through Feedback Control

Physics 5A/L and 5C/N, Introduction to Physics I/Laboratory and Physics III/Laboratory

Computer Engineering 9, Introduction to Statics Dynamics & Biomechanics

Mathematics 23A, Vector Calculus; or Math 22, Introduction to Calculus of Several Variables

Applied Mathematics and Statistics 10, Mathematical Methods for Engineers I

Applied Mathematics and Statistics 20, Mathematical Methods for Engineers II

Computer Engineering 12/L, Computer Systems and Assembly Language/Laboratory

Computer Engineering 13/L, Computer Systems and C Programming/Laboratory

Computer Engineering 100/L, Logic Design/Laboratory

Microbiology and Environmental Toxicology (METX)

135/L, Functional Anatomy/Laboratory

Computer Engineering 118/L, Introduction to Mechatronics/Laboratory

Electrical Engineering 101/L, Introduction to Electronic Circuits/Laboratory

Electrical Engineering 103/L, Signals and Systems/Laboratory

Computer Engineering 167/L, Sensing and Sensor Technologies/Laboratory

Upper-division elective from Baskin School of Engineering or Division of Physical and Biological Sciences.

### **Additional required courses for Assistive Technology: Cognitive/Perceptual concentration (16 courses)**

Computer Engineering 80A, Universal Access: Disability, Technology, and Society

Physics 5A/L or 6A/L, Introduction to Physics I/Laboratory or Introductory Physics I/Laboratory

Physics 5B/M or 6B/M, Introduction to Physics I/Laboratory or Introductory Physics II/Laboratory

Physics 5C/N or 6C/N, Introduction to Physics III/Laboratory or Introductory Physics III/Laboratory

Mathematics 23A, Vector Calculus; or Mathematics 22, Introduction to Calculus of Several Variables

Applied Mathematics and Statistics 7/L, Statistical Methods for the Biological, Environmental, and Health Sciences/Laboratory

One of three introductions to programming:

## Bioengineering

- Computer Science 12A/L, Introduction to Programming/Laboratory; or
- Computer Science 5J, Introduction to Programming in Java and 11, Intermediate Programming; or
- Computer Engineering 12/L, Computer Systems and Assembly Language/Laboratory and Computer Engineering 13/L, Computer Systems and C Programming/Laboratory

Computer Science 12B/M, Introduction to Data Structures/Laboratory

Computer Science 109, Advanced Programming

Psychology 20A, Cognition: Fundamental Theories

Psychology 100, Research Methods in Psychology

Two upper-division Psychology courses selected from the following:

- Psychology 120, Visual and Spatial Cognition
- Psychology 121, Perception
- Psychology 123, Cognitive Neuroscience
- Psychology 128, Human Factors
- Psychology 129, Human Learning and Memory

Computer Engineering 131, Human Computer Interaction

Computer Engineering 161, Mobile Sensing and Interaction

Upper-division elective from Baskin School of Engineering, Division of Physical and Biological Sciences, or Psychology.

### Disciplinary Communication

The Disciplinary Communication requirement is satisfied by the Technical Writing course (CMPE 185 or BME 185) plus the capstone requirement, though oral presentation and writing are integrated throughout the upper-division coursework. The portfolio in the exit requirement is a verification of disciplinary communication in several different forms.

### Exit Requirement

Students are required to submit a portfolio, exit survey, and 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:

- 1) A substantial written report on a design project. This is typically satisfied by a senior thesis, a written capstone project report, or a design report from the Applied Circuits for Bioengineers course.
- 2) Slides from a substantial verbal presentation. This is typically satisfied by a capstone design presentation,

Molecular Biomechanics, Stem Cell Engineering, or other design courses.

3) 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.

### Bioengineering Major Planners

The following sample academic plans show possible courses of study for a bioengineering major. The first plan follows the biomolecular engineering concentration, the second the bioelectronics concentration, the third the assistive technology: motor concentration, and the fourth the assistive technology: cognitive/perceptual concentration.

All plans assume that students are ready for calculus and advanced computer programming courses when they start. Those who need to take precalculus or the CMPS 5J+11 programming series may not be able to complete the entire program within four years.

Students should consider taking courses during the summer to ensure timely completion of the degree. Courses planned to be taken at institutions other than UCSC require pre-approval by the undergraduate director.

All students should meet quarterly with an adviser from the School of Engineering Undergraduate Advising Office to review their finished and planned courses, as schedules and prerequisites change frequently. Any electives should be chosen well ahead of time, to ensure that prerequisites can be scheduled.

Bioengineering

**Plan One (biomolecular engineering)**

Year	Fall	Winter	Spring
1st (frosh)	college core	BME 5	gen ed (C2)
	MATH 19A	MATH 19B	BIOL 20A
	CHEM 1A	CHEM 1B/M	CHEM 1C/N
		BME 88A	
2nd (soph)	BME 80G	gen ed	PHYS 5C/N
	PHYS 5A/L	BIOE 20B	BIOL 105
	CHEM 108A/L	CHEM 108B/M	BME 160/L
3rd (jr)	BIOC 100A	BIOC 100B	BME 150
	CMPS 12A/L	BME 185	BME 101/L
	BME 110	BIOL 101L	BIOL 110
4th (sr)	BME 195	BME 195	BME 195
	AMS 131	AMS 132	BME 128/L
	elective	BME 123T	gen ed

**Plan Two (bioelectronics)**

Year	Fall	Winter	Spring
1st (frosh)	college core	CMPE 12/L	CMPE 13/L
	MATH 19A	MATH 19B	BME 101/L
	PHYS 5A/L	PHYS 5B/M	PHYS 5C/N
		BME 88A	
2nd (soph)	CHEM 1A	CHEM 1B/M	CHEM 1C/N
	AMS 10	AMS 20	gen ed (C2)
	BME 80G	EE 101/L	CMPE 100/L
3rd (jr)	BIOL 20A	CMPE 100/L	EE 171/L
	CMPE 185	CMPE 167/L	EE 103/L
	CMPE 121/L	BIOE 20B	gen ed
4th (sr)	EE 129A	EE 129B	EE 129C
	BME 140	AMS 132	MATH 23A
	AMS 131	gen ed	gen ed

**Plan Three (assistive technology: motor)**

Year	Fall	Winter	Spring
1st (frosh)	college core	gen ed (C2)	CMPE 80A
	MATH 19A	MATH 19B	MATH 22
	PHYS 5A/L	BME 88A	PHYS 5C/N
2nd (soph)	BME 80G	AMS 20	BME 101/L
	CMPE 12/L	CMPE 13/L	CMPE 100/L
	AMS 10	CMPE 9	gen ed
3rd (jr)	EE 101/L	gen ed	EE 103/L
	CHEM 1A	CHEM 1B/M	BIOL 20A
	AMS 131	CMPE 185	PBSci/BSoE elective
4th (sr)	CMPE 129A	CMPE 129B	CMPE 129C
	CMPE 118/L	AMS 132	gen ed
	BIOE 20B	CMPE 167/L	METX 135/L

**Plan four (assistive technology: cognitive/perceptual)**

Year	Fall	Winter	Spring
1st (frosh)	college core	gen ed (C2)	CMPE 80A
	MATH 19A	MATH 19B	MATH 22
	PHYS 5A/L	PHYS 5B/M	PHYS 5C/N
2nd (soph)	CHEM 1A	CHEM 1B/M	BIOL 20A
	BME 80G	CMPS 12A/L	CMPS 12B/M
	AMS 7/L	PSYC 100	BME 101/L
3rd (jr)	PSYC 20A	PSYC 120	PSYC 128
	BIOE 20B	CMPE 131	CMPS 109
	gen ed	CMPE 161	gen ed
4th (sr)	CMPE 195	CMPE 195	CMPE 195
	CMPE 185	AMS 132	elective
	AMS 131	gen ed	gen ed
		BME 123T	

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## BIOENGINEERING PARTICIPATING FACULTY AND PROFESSIONAL INTERESTS

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**Mark Akesson (Biomolecular Engineering)**

Development of nanopore sensors for single molecule identification, epigenetics, bioethics

**Manuel Ares Jr. (Molecular, Cell, and Developmental Biology)**

RNA processing, structure and function of RNA

**Phillip Berman (Biomolecular Engineering)**

Baskin Distinguished Professor  
Drug development, vaccines, AIDS, monoclonal antibody therapeutics, immunology, molecular cell/biology, recombinant protein production (commercial scale)

**David Deamer (Biomolecular Engineering, Emeritus, UC Davis)**

Membrane biophysics, nanopore analysis, DNA sequencing, biomolecular self-assembly

**David Draper (Applied Mathematics and Statistics)**

Bayesian inference, prediction and decision-making; hierarchical modeling; Bayesian non-parametric methods; model specification and model uncertainty; Bayesian data science; accurate Bayesian computations with massive data; quality assessment; risk assessment; statistical applications in the environmental, medical, and social sciences

**William Dunbar (Computer Engineering)**

Theory and application of feedback control, single-molecule biophysics, nanopore sensors, dynamics and control of biomolecules

**Camilla Forsberg (Biomolecular Engineering)**

Hematopoietic stem cells, transcriptional regulation, chromatin, blood cell development, cell surface receptors, genomics

**Alexander A. Grillo (SCIPP)**

Neurophysiology, neural systems, high-energy particle physics

**Grant Hartzog (Molecular, Cell, and Developmental Biology)**

Biochemistry, genetics, chromatin and transcriptional regulation

**David Haussler (Biomolecular Engineering)**

Bioinformatics, genomics, computational genomic data analysis, molecular evolution and comparative genomics, genomic and clinical data sharing and standards, cancer genomics, neurodevelopment, stem cell research, immunogenomics, information theory, pattern recognition, machine learning, artificial

intelligence, information theory, theoretical computer sciences

**Richard Hughey (Biomolecular Engineering and Computer Engineering)**

Bioinformatics, hidden Markov models, computer architecture, parallel computation

**Michael Isaacson (Electrical Engineering)**

Nano- and microfabrication technology and applications to biomedical and diagnostic devices, nanocharacterization of materials with emphasis on the development of microscopy tools, novel modes of imaging, electron and light optics; renewable energy systems; STEM education

**Kevin Karplus (Biomolecular Engineering)**

Genome assembly from next-generation sequence data (Formerly protein structure prediction), signal processing and statistics for nanopore signals

**Douglas Kellogg (Molecular, Cell, and Developmental Biology)**

Coordination of cell growth and cell division

**Joel Kubby (Electrical Engineering)**

Micro-Electro-Mechanical-Systems (MEMS), adaptive optics (AO), optical-MEMS, bio-MEMS, bio-imaging, AO microscopy, AO astronomy

**Sri Kurniawan (Computational Media; Computer Engineering)**

Human-computer interaction; human factors and ergonomics; accessibility; assistive technology; usability; empirical studies; human-centered design

**Alan M. Litke (SCIPP)**

Neural systems; retinal processing; development and prosthesis; technology development for neurophysiology; high-energy physics

**Todd Lowe (Biomolecular Engineering)**

Experimental and computational genomics, non-coding RNA gene finders, high-throughput small RNA sequencing, small RNA roles in cancer, evolution of RNA-based gene regulation

**Roberto Manduchi (Computer Engineering)**

Computer vision and sensor processing, with application to assistive technology for the visually impaired

**Dominic W. Massaro, Emeritus (Psychology)**

**Glenn L. Millhauser (Chemistry and Biochemistry)**  
Electron spin resonance; nuclear magnetic resonance, melanocortin receptor signaling, agouti proteins, prions, peptide synthesis

## Bioengineering

### **Linda Ogren (Molecular, Cellular, and Developmental Biology)**

Endocrinology

### **Eric Palkovacs (Ecology and Evolutionary Biology)**

Freshwater ecology, eco-evolutionary dynamics, fisheries and fish ecology

### **Nader Pourmand (Biomolecular Engineering)**

Bioelectronics, biosensors, chemosensors, nanotechnology, single cell characterization, sequencing, genotyping, pathogen detection, DNA fingerprinting

### **Raquel Prado (Applied Mathematics and Statistics)**

Bayesian non-stationary time series modeling, multivariate time series, biomedical signal processing and statistical genetics

### **Wendy Rothwell (Biomolecular Engineering)**

Biotechnology, molecular genetics

### **Holger Schmidt (Electrical Engineering)**

Narinder Singh Kapany Endowed Chair in Optoelectronics  
Optofluidics, atom photonics, hollow-core photonics for biomedicine and quantum optics, nano-magnetism, nano-magneto-optics, single-particle spectroscopy, ultrafast optics

### **Andrea Steiner (Community Studies)**

Health-care systems, health justice, critical public health, gerontology, ageism, long-term care

### **Joshua Stuart (Biomolecular Engineering)**

Jack Baskin Endowed Chair of Biomolecular Engineering

Computational functional genomics, comparative analysis of gene regulation, cross-species inference of gene networks, probabilistic graphical models

### **Ellen Kappy Suckiel, Emerita (Philosophy)**

Ethics, William James, American philosophy, genetic ethics, ethics of biotechnology

### **John Tamkun (Molecular, Cell, and Developmental Biology)**

Transcriptional regulation, molecular genetics of Drosophila development, regulation of gene expression

### **John F. Vesecky (Electrical Engineering)**

HF radar design and construction and observation of ocean surface winds, waves and currents with applications to coastal and deep water ocean processes; project MEDSAT

### **Alan M. Zahler (Molecular, Cell, and Developmental Biology)**

Molecular biology, splice site selection, and alternative pre-mRNA processing

### **Jin Z. Zhang (Chemistry and Biochemistry)**

Design, synthesis, characterization, and application of nanomaterials, including semiconductor and metal nanoparticles; femtosecond laser spectroscopy; ultrafast dynamics on surfaces and at interfaces; cancer biomarker detection; surface-enhanced Raman spectroscopy

### **Yi Zuo (Molecular, Cell, and Developmental Biology)**

Glia-synapse interaction and synaptic plasticity in vivo

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# BIOMOLECULAR ENGINEERING

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2015-16 General Catalog

Baskin School of Engineering  
335 Baskin Engineering Building  
(831) 459-2158  
<http://www.soe.ucsc.edu>

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## PROGRAM DESCRIPTION

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The Department of Biomolecular Engineering 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 an undergraduate minor and a bachelor of science (B.S.) degree 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 B.S. in bioengineering program, described elsewhere in this catalog, with the departments of Computer Engineering, Electrical Engineering, and Molecular, Cell, and Developmental (MCD) Biology. 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.

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### BIoinFORMATICS MAJOR

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Bioinformatics 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 Center for Biomolecular Science and Engineering, <http://cbse.ucsc.edu>.

The Human Genome Project, the international collaboration to determine the sequence of human DNA and understand its function, had its origin in a conference that took place at UCSC in 1985. One notable output from our research is that UCSC is the primary release site for the public version of the human genome (<http://genome.ucsc.edu>), as well as the repository for the ENCODE (**Encyclopedia Of DNA Elements**) project, an international effort to annotate the entire human genome with multiple functional assays. We also have a strong research group in systems biology, functional genomic characterization of stem cells, and play a lead role in national efforts to discover molecular underpinnings of various cancers, including participating as a Dream Team for the Stand Up To Cancer project and a data-analysis center for The Cancer Genome Atlas project.

The undergraduate bioinformatics degree program prepares students for graduate school or a career in the pharmaceutical or biotechnology industries.

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 program 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.

The undergraduate degree program in bioinformatics builds a solid foundation in the constituent areas of the field. Students complete core sequences in mathematics (including calculus, statistics, and discrete

## Biomolecular Engineering

mathematics), science (including biology, chemistry, and biochemistry), and engineering (including programming, algorithms, and databases). The core topics are brought together in two bioinformatics courses: Biomolecular Engineering 110, Computational Biology Tools, and Biomolecular Engineering 205, Bioinformatics Models and Algorithms. Students have two electives for specialization within the fields of bioinformatics and are required to take Biomolecular Engineering 80G, Bioethics in the Twenty-First Century: Science, Business, and Society to study the ethical, legal, and social implications of this new technology.

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### PROGRAM LEARNING OUTCOMES

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A bioinformatics student completing the program should:

- have a detailed knowledge of statistics, computer science, biochemistry, and genetics;
- be able to find and use information from a variety of sources, including books, journal articles, and online encyclopedias;
- be able to design and conduct computational experiments, as well as to analyze and interpret data;
- be able to apply their knowledge to write programs for answering research questions in biology;
- 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.

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### COURSES FOR NONMAJORS

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Biomolecular Engineering 5, Introduction to Biotechnology, presents a broad overview of the impact of biotechnology on the diagnosis and treatment of disease.

Biomolecular Engineering 160, Programming for Biologists and Biochemists, provides an introductory programming class using Python to analyze, transform, and publish biological data.

Biomolecular Engineering 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.

Biomolecular Engineering 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.

Biomolecular Engineering 130, Genomes, teaches the principles of genome-scale analysis to answer biological questions.

Biomolecular Engineering 155, Biotechnology and Drug Development, examines the science and process of discovering, testing, and manufacturing new drugs within the pharmaceutical industry.

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### BIOINFORMATICS POLICIES

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#### DECLARATION OF THE MAJOR

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Admission to the bioinformatics major is based on the required lower-division courses: BIOL 20A, BIOE 20B, BME 80G, CHEM 1A, CHEM 1B/M, CHEM 1C/N, CMPE 16, CMPS 12A/L (or CMPS 5J and 11 OR CMPE 12/L and CMPE 13/L), CMPS 12B/M, MATH 19A, MATH 19B, MATH 23A, and fundamental upper-division courses: AMS 131, CHEM 108A/L, CHEM 108B/M, and CMPS 101. Students must have completed 50 credits from this list by the end of the fifth quarter. Students must also have a GPA of 2.8 or better in all attempts in these courses. Students changing major after the sixth quarter will need 10 additional credits for each additional quarter.

Denials of admission to the major may be appealed by submitting a letter to the School of Engineering Undergraduate Office, describing why the grade point average obtained is not an accurate reflection of the student's potential, or requesting that other completed upper-division courses be considered in admissions process.

#### COURSES TAKEN ELSEWHERE

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Please refer to the School of Engineering section of the catalog for policies about taking courses at other institutions after enrolling at UCSC.

#### HONORS IN THE MAJOR

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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 receive "Highest Honors in the Major." Students with a GPA of 3.3 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.

## Biomolecular Engineering

### TRANSFER STUDENTS

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Transfer students need eight transferable courses from the list of courses used for admission to the major for on-campus students, with a GPA in those courses of 2.8 or better. Students with fewer than 10 transferable courses may find it difficult to complete the major in only two more years.

### SCHOOL OF ENGINEERING POLICIES

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Please refer to the School of Engineering section of the catalog for additional policies that apply to all School of Engineering programs.

### PREPARATION FOR THE MAJOR

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Students applying for admission to the 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.

### REQUIREMENTS OF THE BIOINFORMATICS MAJOR

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Every bioinformatics major must have a faculty adviser, assigned by the Baskin School of Engineering undergraduate advising office, and with that adviser must formulate a program of proposed course work that meets the major requirements. Because of the enormous breadth of requirements, 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.

### LOWER-DIVISION REQUIREMENTS

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Majors must complete the following lower-division courses:

#### **Biology**

Biology (BIOL) 20A, Cell and Molecular Biology

Biology (BIOE) 20B, Development and Physiology

#### **Biomolecular Engineering**

Biomolecular Engineering 80G, Bioethics in the Twenty-First Century: Science, Business, and Society

#### **Chemistry**

Chemistry 1A, 1B/M, and 1C/N, General Chemistry/Laboratory

#### **Computer Engineering**

Computer Engineering 16, Applied Discrete Mathematics

#### **Programming 1**

Computer Science 12A/L, Introduction to Programming/Laboratory (accelerated); or

Computer Science 5J, Introduction to Programming in Java, and 11, Intermediate Programming; or

Computer Engineering 12/L, Computer Systems and Assembly Language/Laboratory, and 13/L, Computer Systems and C Programming/Laboratory

#### **Programming 2**

Computer Science 12B/M, Introduction to Data Structures/Laboratory

#### **Mathematics**

Mathematics 20A-B, Honors Calculus; or

Mathematics 19A-B, Calculus for Science, Engineering, and Mathematics (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.)

Mathematics 23A, Multivariable Calculus

### UPPER-DIVISION REQUIREMENTS

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Majors must complete the following upper-division courses:

#### **Applied Mathematics and Statistics**

Applied Mathematics and Statistics 131, Introduction to Probability Theory

Applied Mathematics and Statistics 132, Statistical Inference

#### **Biochemistry and Molecular Biology**

Biochemistry 100A, Biochemistry (first in three-part sequence)

#### **Bioinformatics**

Biomolecular Engineering 110, Computational Biology Tools

Biomolecular Engineering 130, Genomes

Biomolecular Engineering 205, Bioinformatics Models and Algorithms

One of the following:

Biomolecular Engineering 211, Computational Systems Biology; or

Biomolecular Engineering 230/L, Computational Genomics/Laboratory; or

Biomolecular Engineering 195, Senior Thesis Research

#### **Biology (BIOL)**

Biology 105, Genetics

## Biomolecular Engineering

### Chemistry

Chemistry 108A/L and 108B/M, Organic Chemistry/Laboratory; or

### Technical Writing

Computer Engineering 185, Technical Writing for Computer Engineers; or

Biomolecular Engineering 185, Technical Writing for Biomolecular Engineers

### Computer Science

Computer Science 101, Algorithms and Abstract Data Types

Computer Science 109, Advanced Programming

One of the following:

Computer Science 182, Introduction to Database Management Systems, or

Computer Science 180, Database Systems

### REQUIRED ELECTIVES

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Students must select one additional course as an elective, justify their choice in writing, and get the choice approved by their faculty adviser. The following courses are typical of the ones chosen, but do not constitute a pre-approved list:

Applied Mathematics and Statistics 162

Biochemistry 100B, 100C, 110

Biology 105L, 105M, 109L, 110, 115, 115L, 117A, 117B, 140, 187L, 200A, 200B

Biomolecular Engineering 101/L, 128, 140, 150, 155, 177, 178, 211, 230

Computer Engineering 108, 177

Computer Science 104A, 105, 115, 116, 130, 140, 142, 160/L

Microbiology and Environmental Toxicology 119, 119L

Technology and Information Management 105, 206

**Note:** many of these courses are offered only once a year and have long prerequisite chains, so advance planning is necessary to make sure elective courses can be fit into the student's schedule.

### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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Students of every major must satisfy that major's upper-division disciplinary communication (DC) requirement. Bioinformatics majors satisfy the DC requirement by completing Computer Engineering 185, Technical Writing for Engineers, or Biomolecular Engineering 185, Technical Writing for Biomolecular Engineers.

### COMPREHENSIVE REQUIREMENT

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The bioinformatics comprehensive requirement can be met by taking Biomolecular Engineering 211, Computational Systems Biology; or Biomolecular Engineering 230/L, Computational Genomics, which include substantial projects; or Biomolecular Engineering 195, Senior Thesis Research. Students electing the senior thesis must submit a written thesis proposal to the undergraduate director of bioinformatics for approval one quarter prior to submitting the final thesis.

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### REQUIREMENTS OF THE BIOINFORMATICS MINOR

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Where the bioinformatics major is intended for people who wish to become bioinformaticians and create the tools needed to solve new problems in computational biology, 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.

A bioinformatics minor consists of the following 16 courses:

#### LOWER-DIVISION (10 COURSES)

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##### **Biology (2)**

Biology 20A, Cell and Molecular Biology; and  
Biology 20B, Development and Physiology

##### **General chemistry (3)**

Chemistry 1A, 1B/M, and 1C/N

##### **Single-Variable Calculus (2)**

Mathematics 19A and 19B (preferred); or

Mathematics 11A and 11B; or

Mathematics 20A and 20B

##### **Programming 1 (1)**

Computer Science 12A/L; or

Computer Science 5J and 11; or

Computer Engineering 12/L and 13/L

##### **Programming 2 (1)**

Biomolecular Engineering 160/L; or

Computer Science 12B/M

##### **Bioethics (1)**

Biomolecular Engineering 80G

#### UPPER-DIVISION (6 COURSES)

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##### **Organic chemistry (1)**

Chemistry 108A

## Biomolecular Engineering

### **Biochemistry (1)**

Biochemistry 100A; or

Chemistry 103; or

Biology 100

### **Statistics (2)**

Computer Engineering 107; or

Applied Mathematics and Statistics 131

Applied Mathematics and Statistics 132

### **Bioinformatics (1)**

Biomolecular Engineering 110

### **ELECTIVE(1)**

Biochemistry 100B; or

any other upper-division or graduate biomolecular engineering course

The bioinformatics minor requirements may satisfy the requirements of other majors or minors under the campus policy discussed in Major and Minor Requirements. Majors with substantial overlap include biochemistry, bioengineering, all biology majors, chemistry, computer science, and computer engineering. Students pursuing one of these majors are particularly encouraged to consider the bioinformatics minor.

## **THE BIOINFORMATICS COMBINED B.S./GRADUATE DEGREE PROGRAM**

Because our bioinformatics B.S. program provides excellent preparation for a graduate program in bioinformatics, we offer a combined B.S./graduate degree program that allows our B.S. students to complete the M.S. (or Ph.D.) somewhat sooner than students with a less tailored preparation.

The current B.S. and graduate requirements have three courses in common:

Biomolecular Engineering 80G, Bioethics in the 21st Century

Biomolecular Engineering 205, Bioinformatics Models and Algorithms

Biomolecular Engineering 230, Computational Genomics

The combined B.S./graduate degree program does not make any changes to the undergraduate program, except that students must pass the three overlapping courses listed above for a grade of B- or better.

The requirements at the graduate level are changed to remove the three courses that overlap with the B.S. and to add one graduate elective to be chosen by the students with the approval of their advisers. Thus, the

total number of full courses required is reduced from nine to seven.

To apply for the combined program, students apply to the M.S. or Ph.D. 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. or B.S./Ph.D. program.

## **BIOINFORMATICS MAJOR PLANNERS**

As in all engineering and science programs, it is recommended that students spread their general education requirements out over all 12 quarters. Students undecided about pursuing a bioengineering or bioinformatics degree should follow the biomolecular engineering concentration of the bioengineering B.S. program and complete the programming sequence (Computer Science 12A and 12B) by the end of their second year.

Four-year plans require individual design to fit in the desired electives, so only the first two years of the academic plan are presented here. It is recommended that students reserve the summer after the junior year for undergraduate research. One popular plan involves taking organic chemistry and the associated laboratories in the summer after completing general chemistry, so that biochemistry may be started in the junior year.

Biomolecular Engineering 205, Bioinformatics Models and Algorithms, should be taken after Biomolecular Engineering 110, Computational Biology Tools.

Sample Plan			
Year	Fall	Winter	Spring
1st (frsh)	MATH 19A	MATH 19B	MATH 23A
	CHEM 1A	CHEM 1B/M	CHEM 1C/N
	college core	gen ed	gen ed
2nd (soph)	BIOL 20A	CMPS 12A/L	CMPS 12B/M
	CHEM 108A/L	BIOE 20B	CMPE 16
	BME 80G	gen ed	gen ed

## **BIOMOLECULAR ENGINEERING AND BIOINFORMATICS GRADUATE PROGRAM**

The Department of Biomolecular Engineering offers interdisciplinary M.S. and Ph.D. degrees in biomolecular engineering and bioinformatics.

### **COURSE REQUIREMENTS**

Both masters and doctoral students must complete eight, 5-credit courses and one 3-credit research and teaching course. In addition, M.S. students must

## Biomolecular Engineering

complete three seminar courses, while Ph.D. students must complete five seminar courses. M.S. students must also complete one lab rotation, and Ph.D. students must complete three research laboratory rotations (course 296) with different supervisors.

### **Core courses (5-credit) six are required**

#### **Bioinformatics Emphasis**

- BME 205, Bioinformatics Models and Algorithms
- Two Biomolecular Engineering graduate courses from the bioinformatics list
- One Biomolecular Engineering graduate course from the biomolecular engineering list
- One graduate statistics course (Applied Mathematics and Statistics 206B recommended)
- One graduate course from MCD Biology, Chemistry and Biochemistry, or Microbiology and Environmental Toxicology

#### **Biomolecular Engineering Emphasis**

- BME 250, Molecular Biomechanics
- Two Biomolecular Engineering graduate course from the biomolecular engineering list
- One Biomolecular Engineering graduate courses from the bioinformatics list
- Two graduate courses from Applied Mathematics and Statistics, MCD Biology, Chemistry and Biochemistry, or Microbiology and Environmental Toxicology

### **Ethics Course (5-credit) one is required**

- BME 80G, Bioethics in the Twenty-First Century: Science, Business, and Society
- Sociology 268A, Science and Justice: Experiments in Collaboration.

### **Electives (5-credit) one is required**

One graduate course consistent with the students degree objectives. With preapproval by the graduate director, this elective may be an upper-division undergraduate course selected to improve background in areas not studied as an undergraduate.

Independent or thesis research courses cannot be counted as electives.

Students must choose courses with faculty guidance and approval to balance their preparation and make up for deficiencies in background areas. With consent of the graduate director, variations in the composition of the required courses may be approved.

### **OTHER CURRICULUM REQUIREMENTS**

BME 200, Research and Teaching in Bioinformatics, 3 credits

## Seminars

M.S. students: a minimum of three seminar courses, including at least one quarter of the 2-credit Biomolecular Engineering seminar, 280B

Ph.D. students: a minimum of six seminar courses, including at least two quarters of the 2-credit Biomolecular Engineering seminar, 280B

Before and after advancement, full-time Ph.D. students are required to enroll in at least one seminar course each quarter (e.g., 280 or 281), and must present the results of their ongoing research at least once each year. Because the intent of the seminar requirement is to ensure breadth of knowledge, lab group meetings (BME 281 courses) do not count for the seminar requirement.

### **Research Experience**

M.S. students: one laboratory rotation (BME 296), and one quarter of independent study (BME 297).

Ph.D. Students: three laboratory rotations (course 296), generally within the first 12 months. One of the laboratory rotations must be with a faculty supervisor who does wet-lab research, though the students rotation project may be purely computational.

### **COURSE LISTS**

The following are the bioinformatics and biomolecular engineering course lists. The lists are subject to change as courses and course content changes. The graduate office maintains the current list.

Bioinformatics list: 205, 211, 230, 235

Biomolecular Engineering list: 215, 250, 255

### **QUALIFYING EXAMINATIONS**

Ph.D. students are required to pass the qualifying examination and advance to candidacy by the end of their second year.

### **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

## Biomolecular Engineering

should consult with their adviser and the graduate director.

### MASTERS CAPSTONE REQUIREMENT

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M.S. students must complete a one-quarter research project with written report to fulfill the capstone requirement. In consultation with the faculty adviser, the student forms a Master's Capstone Reading Committee of at least two faculty members (including the adviser), each of whom is provided a copy of the project report. The final project report must be signed by the reading committee before the award of the Master of Science Degree.

### DOCTORAL DISSERTATION REQUIREMENTS

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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. 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. The candidate will present his or her 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.

### TRANSFER LIMITATIONS

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Up to two courses may be transferred from other graduate institutions with the approval of the faculty adviser and the graduate director.

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## BIOMOLECULAR ENGINEERING FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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#### **Mark Akeson**

Development of nanopore sensors for single molecule identification, epigenetics, bioethics

#### **Phillip Berman**

#### **Baskin Distinguished Professor**

Drug development, vaccines, AIDS, monoclonal antibody therapeutics, immunology, molecular cell/biology, recombinant protein production (commercial scale)

#### **Camilla Forsberg**

Hematopoietic stem cells. transcriptional regulation, chromatin, blood cell development, cell surface receptors, genomics

#### **David Haussler**

Bioinformatics, genomics, computational genomic data analysis, molecular evolution and comparative genomics, genomic and clinical data sharing and standards, cancer genomics, neurodevelopment, stem cell research, immunogenomics, information theory, pattern recognition, machine learning, artificial intelligence, information theory, theoretical computer science

#### **Richard Hughey (joint with Computer Engineering)**

Bioinformatics, hidden Markov models, computer architecture, parallel computation

#### **Kevin Karplus**

Genome assembly from next-generation sequence data (Formerly protein structure prediction), signal processing and statistics for nanopore signals

#### **Todd Lowe**

Experimental and computational genomics, non-coding RNA gene finders, and high-throughput small RNA sequencing small RNA roles in cancer, evolution of RNA-based gene regulation

#### **Nader Pourmand**

Bioelectronics, biosensors, chemosensors, nanotechnology, single-cell characterization, sequencing, genotyping, pathogen detection, DNA fingerprinting

#### **Joshua Stuart**

#### **Jack Baskin Endowed Chair of Biomolecular Engineering**

Computational functional genomics, comparative analysis of gene regulation, cross-species inference of gene networks, probabilistic graphical models

## Biomolecular Engineering

### ASSISTANT PROFESSOR

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#### **Angela Brooks**

Genomics, functional genomics, cancer genomics, RNA processing, gene regulation, gene variant function

#### **Rebecca M. Dubois**

Protein engineering; structural virology and biomedical applications

#### **Richard "Ed" Green**

Genomics, computational molecular biology, genome assembly, human evolutionary genetics, ancient DNA, high-throughput sequencing, mRNA-processing and alternative splicing

#### **Christopher Vollmers**

Developing DNA sequencing tools to analyze B cells on a population and single cell level

### RESEARCH PROFESSOR

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#### **David W. Deamer (UC Davis Emeritus)**

Membrane biophysics, nanopore analysis, DNA sequencing, biomolecular self-assembly

#### **Adjunct Professor**

#### **Robert Coffman**

Regulation of innate and adaptive immunity, systems biology of human immune responses, development of novel vaccines and oligonucleotide-based drugs

#### **Jonathan Trent**

Organic aggregates, marine snow, microbial physiology, microenvironments, robust proteins, genetic engineering for nanotechnology

#### **Zemin Zhang**

Cancer genomics, bioinformatics, anti-cancer target and biomarker discovery, tumor immunology, drug-genome interaction

#### **Assistant Adjunct Professor and Lecturer**

#### **David Bernick**

Biofuel production using reengineered extremophiles, especially halophiles; next-generation sequencing applications including genome assembly, metagenome assembly and RNA transcriptomics; extremozymes - viral/microbial gene discovery - RNA/RNA packing motors and porins; single-molecule sequencing of highly structured/modified tRNA; novel halo virus discovery

### LECTURER

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#### **Wendy Rothwell**

Biotechnology, molecular genetics



#### **Manuel Ares, Jr. (Molecular, Cell, and Developmental Biology)**

RNA processing, structure and function of RNA

#### **Hinrich Boeger (Molecular, Cell, and Developmental Biology)**

Chromatin structure and gene regulation

#### **Manel Camps (Microbiology and Environmental Toxicology)**

Molecular mechanisms of reactive DNA methylation toxicity

#### **William Dunbar (Computer Engineering)**

Theory and application of feedback control, single-molecule biophysics, nanopore sensors, dynamics and control of biomolecules

#### **Lars Fehren-Schmitz (Anthropology)**

Palaeogenetics/anthropological genetics, human evolutionary ecology, evolutionary demography, gene-culture coevolution, migration theories, population history of the Americas, archaeology of South America

#### **A. Russell Flegal (Microbiology and Environmental Toxicology)**

Anthropogenic perturbations of biogeochemical cycles, applications of isotopic tracers in anthropology and archaeology

#### **Robert S. Lokey (Chemistry and Biochemistry)**

Organic chemistry, combinatorial synthesis, biotechnology, molecular cell biology

#### **Glenn L. Millhauser (Chemistry and Biochemistry)**

Electron spin resonance; nuclear magnetic resonance, melanocortin receptor signaling, agouti proteins, prions, peptide synthesis

#### **Karen Ottemann (Microbiology and Environmental Toxicology)**

How bacterial pathogens are able to chronically colonize mammalian hosts and cause disease outcomes such as inflammation and cancer

#### **Beth Shapiro (Ecology and Evolutionary Biology)**

Evolutionary and molecular ecology, ancient DNA, genomics, pathogen evolution

#### **John W. Tamkun (Molecular, Cell, and Developmental Biology)**

Transcriptional regulation, molecular genetics of *Drosophila* development, regulation of gene expression

#### **Hongyun Wang (Applied Mathematics and Statistics)**

Single molecule studies and biophysics, statistical physics, stochastic processes and stochastic differential equations, classical analysis, numerical analysis

#### **Manfred K. Warmuth (Computer Science)**

Online learning, machine learning, statistical decision theory, game theory, analysis of algorithms

#### **W. Todd Wipke, Emeritus (Chemistry and Biochemistry)**

**Fitnat H. Yildiz (Microbiology and Environmental Toxicology)**

Understanding processes controlling transmission of bacterial pathogens

**Alan M. Zahler (Molecular, Cell, and Developmental Biology)**

Alternative pre-mRNA splicing and small RNA function

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## BIOMOLECULAR ENGINEERING COURSES

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### LOWER-DIVISION COURSES

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**5. Introduction to Biotechnology. F,W,S**

Introduces the tools and applications of biotechnology in the fields of medicine, agriculture, the environment, and industry. (General Education Code(s): PE-T, IN.) W. Rothwell, The Staff

**80G. Bioethics in the 21st Century: Science, Business, and Society. F**

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. (Also offered as Philosophy 80G. Students cannot receive credit for both courses.) (General Education Code(s): PE-T, T6-Natural Sciences or Humanities and Arts.) S. Dreisbach, The Staff

**80H. The Human Genome. F,W,S**

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. (General Education Code(s): PE-T, T2-Natural Sciences.) W. Rothwell, The Staff

**88A. BMES Freshman Design Seminar (2 credits). W**

A first course in engineering design for bioengineers. In cooperation

with the Biomedical Engineering Society (BMES). Students choose a design project and work on it in competitive and cooperative teams. Covers research, design, prototyping, and report writing. Enrollment restricted to first-year Bioengineering majors and proposed majors. Enrollment limited to 25. (General Education Code(s): PR-E.) K. Karplus

**94. Group Tutorial. F,W,S**

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. May be repeated for credit. The Staff

**94F. Group Tutorial (2 credits). F,W,S**

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. May be repeated for credit. The Staff

**99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**99F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### UPPER-DIVISION COURSES

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**101. Applied Electronics for Bioengineers. S**

Introduces analog electronics. Topics include circuit theory (Kirchhoff's laws, Thevenin equivalents); constant and

sinusoidal signals; RC filters; op amps; feedback; oscillators; and instrumentation amplifiers. Emphasis is on design for sensors (thermistors, microphones, electrodes, pressure sensors, phototransistors); voltage dividers are a recurring theme. (Formerly Applied Circuits for Bioengineers.) Prerequisite(s): Mathematics 11B, 19B, or 20B and previous or concurrent enrollment in Physics 5C/N or 6C/N; concurrent enrollment in Biomolecular Engineering 101L is required. K. Karplus

**101L. Applied Electronics for Bioengineers Laboratory (2 credits). S**

Twice weekly, three-hour laboratory to design and build circuits to interface sensors used in bioengineering (thermistors, microphones, electrodes, pressure sensors, phototransistors). Students design and build a one-lead electrocardiograph (EKG). Students are billed a materials fee. (Formerly Applied Circuits Laboratory.) Prerequisite(s): Concurrent enrollment in course 101 is required. Enrollment limited to 48. K. Karplus

**110. Computational Biology Tools. F,W**

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

## Biomolecular Engineering

are used on student laptops. Open to all science students; no prior programming or Unix experience required. Prerequisite(s): Biology 100, 105, Biochemistry 100A, or Chemistry 103 or declared Bioinformatics majors. Enrollment limited to 25. T. Lowe, The Staff

### **123A. Bioengineering Project 1 (7 credits). F**

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. Students are billed a materials fee. Prerequisite(s): course 140 or 150, and previous or concurrent enrollment in course 185 or Computer Engineering 185. Enrollment restricted to senior biogengineering majors. (General Education Code(s): PR-E.) The Staff, M. Akesson, K. Karplus

### **123B. Bioengineering Project 2 (7 credits). W**

Second of two-course bioengineering group project sequence. Students implement and test the engineering designs from course 123A. Requires oral progress reports and formal oral presentation before faculty. Students are billed a materials fee. Prerequisite(s): course 123A, and course 185 or Computer Engineering 185. Enrollment restricted to senior biogengineering majors. Enrollment limited to 30. (General Education Code(s): PE-E.)

M. Akesson, The Staff

### **123T. Senior Thesis Writing (2 credits). W**

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. Enrollment is restricted to senior biogengineering majors. (Formerly Senior Thesis Presentation.) Prerequisite(s): course 185 or Computer Engineering (CMPE) 185. Concurrent enrollment in course 193 or course 195 or course 198 or CMPE 193 or CMPE 195 or CMPE 198 or Electrical Engineering (EE) 193 or EE 195 or EE 198 is required. Enrollment limited to 25. The Staff, M. Akesson, K. Karplus

### **128. Protein Engineering. S**

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(s): Biology 20A, and Biology 100 or Biochemistry and Molecular Biology 100A, or by permission of instructor. R. Dubois, The Staff

### **128L. Protein Engineering Laboratory (2 credits). S**

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. Students are billed a materials fee. Prerequisite(s): Biochemistry 100A or Biology 100, and Biology 100K or

Biology 101L. Concurrent enrollment in course 128 is required. Enrollment is restricted to junior and senior bioengineering majors; other majors by permission of instructor. Enrollment limited to 20. R. Dubois, (F) The Staff

### **130. Genomes. F**

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(s): Biology 100 or Chemistry 103 or Biochemistry 100A; and Biology 105; or approval of instructor. Enrollment limited to 30. R. Green

### **140. Bioinstrumentation. F**

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, fabless nanofabrication, ion-sensitive measurements, microarray fabrication, and fluorescent-activated cell sorter (FACS). Students are billed a materials fee. Prerequisite(s): course 5, or course 101/L, or Electrical Engineering 101/L, or Biology 100, or Biochemistry and Molecular Biology 100A. N. Pourmand

### **150. Molecular Biomechanics. S**

Considers how assemblies of macromolecules (molecular

## Biomolecular Engineering

motors) convert chemical energy into mechanical work on the nanometer-to-Angstrom scale. Processes examined include ATP-dependent movement of organelles in the cytosol facilitated by kinesin; proton pumping by ATPases in the mitochondrial membrane; viral genome packaging; bacterial movement driven by flagella; processive addition of nucleotides by polymerases during replication and transcription; and protein synthesis by ribosomes. Cannot receive credit for this course and course 250. Prerequisite(s): Biology 20A; and Biology 20B or 105; and Biology 100 or Biochemistry 100A. M. Akeson

### **155. Biotechnology and Drug Development. W**

Recommended for students interested in careers in the biopharmaceutical industry. Focuses on recombinant DNA technology and the drug-development process, including discovery research; preclinical testing; clinical trials; and regulatory review, as well as manufacturing and production considerations. Students may not receive credit for this course and Biomolecular Engineering 255 and Chemistry 255. Prerequisite(s): Biology 20A and Biology 100 or Chemistry 103 or Biochemistry and Molecular Biology 100A. Enrollment limited to 15. P. Berman

### **160. Research Programming in the Life Sciences. F,S**

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. BioPython and other modules introduced for use in the final project. (Formerly Research Programming for Biologists and Biochemists.) Prerequisite(s): Biology 20A or 21A. Previous or concurrent enrollment in course 160L is required. (General Education Code(s): MF.) J. Stuart, The Staff

### **160L. Research Programming in the Life Sciences Laboratory (1 credit). F,S**

Laboratory sequence illustrating topics covered in course 160. One two-hour laboratory per week. (Formerly Research Programming for Biologists and Biochemists Laboratory.) Prerequisite(s): Biology 20A or 21A. Previous or concurrent enrollment in course 160 is required. J. Stuart, The Staff

### **170. Drug Action and Development. \***

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 270. (Formerly Frontiers in Drug Action and Discovery.) (Also offered as Chemistry and Biochemistry 170. Students cannot receive credit for both courses.) Prerequisite(s): Biology 100 or Chemistry 103 or Biochemistry 100A. Biology 110 and 130/L or 131/L are recommended. Enrollment restricted to juniors and seniors. D. Smith, T. Holman, M. Camps, R. Lington, P. Berman

### **177. Engineering Stem Cells. W**

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(s): course 140 or 150, and BIOL 100, or by consent of instructor. Enrollment limited to 30. C. Forsberg, The Staff

### **178. Stem Cell Biology. W**

Basic concepts, experimental approaches, and therapeutic potential are discussed. Students gain experience in reading the primary scientific literature. Prerequisite(s): Biology 110; Biology 115 recommended. C. Forsberg

### **180. Professional Practice in Bioengineering (2 credits). S**

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(s): previous or concurrent enrollment in course 185 or Computer Engineering 185. Enrollment is restricted to junior and senior bioengineering and bioinformatics majors or by permission of instructor. Enrollment limited to 25. (General Education Code(s): PR-E.) D. Bernick

### **185. Technical Writing for Biomolecular Engineers. W**

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

## Biomolecular Engineering

presentation. Prerequisite(s): satisfaction of Entry Level Writing and Composition

requirements; previous or concurrent enrollment in BIOL 101L, BIOL 100K, or BME 150L. Enrollment restricted to junior or senior bioengineering or bioinformatics majors. Enrollment limited to 20. K. Karplus

### **193. Field Study. F,W,S**

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. May be repeated for credit. The Staff

### **193F. Field Study (2 credits). F,W,S**

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. May be repeated for credit. The Staff

### **194. Group Tutorial. F,W,S**

A program of study arranged between a group of students and a faculty member. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **194F. Group Tutorial (2 credits). F,W,S**

A program of independent study arranged between a group of

students and a faculty member. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **195. Senior Thesis Research. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **195F. Senior Thesis or Research (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **198. Individual Study or Research. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **198F. Individual Study or Research (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

For fourth-year students majoring in bioinformatics or bioengineering. May be repeated for credit. The Staff

## GRADUATE COURSES

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### **200. Research and Teaching in Bioinformatics (3 credits). F**

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. Examines research and professional training, including use of library and online databases, technical typesetting, writing journal and conference papers, publishing in bioinformatics, giving talks in seminars and conferences,

and ethical issues in science and engineering. Required for all teaching assistants. Enrollment restricted to graduate students. K. Karplus

### **201. Scientific Writing (3 credits). W**

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 evaluation each of these documents. Enrollment is restricted to graduate students. R. Green

### **205. Bioinformatics Models and Algorithms. F**

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. Enrollment restricted to graduate students. Undergraduates may enroll with prerequisite(s): Computer Science 12B; and Computer Engineering 107 or Applied Math and Statistics 131; and Biology 20A; and concurrent enrollment in Biochemistry 100A. K. Karplus

### **211. Computational Systems Biology. F**

Teaches machine-learning methods relevant for the analysis of high-throughput molecular biology experiments. Students should be fluent in a programming language and should have taken basic molecular biology courses. Prerequisite(s): course 205. Enrollment restricted to graduate students; undergraduates may

## Biomolecular Engineering

enroll if they have completed course 205, Computer Science 101, and any upper-division molecular biology or biochemistry course, such as Biochemistry 100 or 100A. J. Stuart

### **215. Applied Gene Technology.**

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. Enrollment restricted to graduate students. N. Pourmand

### **230. Computational Genomics. W**

Genomics databases: analysis of high-throughput genomics datasets; BLAST and related sequence comparison methods; pairwise alignment of biosequences by dynamic programming; statistical methods to discover common motifs in biosequences; multiple alignment and database search using motif models; constructing phylogenetic trees; hidden Markov models for finding genes, etc.; discriminative methods for analysis of bioinformatics data, neural networks, and support vector machines; locating genes and predicting gene function, including introduction to linkage analysis and disease association studies using SNPs; and modeling DNA and RNA structures. Prerequisite(s): course 205; concurrent enrollment in course 230L, 296, or 297 is required. Enrollment restricted to graduate students; undergraduates may enroll by instructor permission

if they have completed course 205, Computer Science 101, BIOC 100A. J. Stuart, R. Green, D. Haussler

### **230L. Computational Genomics Laboratory (1 credit). W**

Project in computational genomics. Prerequisite(s): course 205; concurrent enrollment in course 230 is required. J. Stuart, R. Green, D. Haussler

### **233. A Technological History of Antibody Genetics. W**

Covers the genetics of antibody formation and the histories of immunology and genetics. Students read and analyze seminal papers on antibody genetics. Enrollment is restricted to graduate students. C. Vollmers

### **235. Banana Slug Genomics.**

Students will assemble and annotate the banana slug genome (*Ariolimax dolichophallus*) from next-generation sequencing data. Students also will explore the capabilities of the latest next-generation bioinformatics tools and write their own as needed. Prerequisite(s): course 205 or graduate status. Seniors who have taken course 110 and a computer programming course may enroll with permission of instructor. May be repeated for credit. K. Karplus, The Staff

### **237. Applied RNA Bioinformatics. F**

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. Enrollment restricted to seniors and graduate students. T. Lowe, The Staff

### **250. Molecular Biomechanics. S**

Considers how assemblies of macromolecules (molecular motors) convert chemical energy into mechanical work on the nanometer-to-Angstrom scale. Processes examined in the course include ATP-dependent movement of organelles in the cytosol facilitated by kinesin; proton pumping by ATPases in the mitochondrial membrane; viral genome packaging; bacterial movement driven by flagella; processive addition of nucleotides by polymerases during replication and transcription; and protein synthesis by ribosomes. Cannot receive credit for this course and course 150. Enrollment restricted to graduate students. M. Akeson

### **255. Biotechnology and Drug Development. W**

Recommended for students interested in careers in the biopharmaceutical industry. Focuses on recombinant DNA technology and the drug-development process, including discovery research; preclinical testing; clinical trials; and regulatory review, as well as manufacturing and production considerations. Students may not receive credit for this course and Biomolecular Engineering 155 and Biology 179. (Also offered as Chemistry and Biochemistry 255. Students cannot receive credit for both courses.) Enrollment limited to graduate students. Enrollment limited to 15. P. Berman

### **268A. Science and Justice: Experiments in Collaboration. \***

Considers the practical and epistemological necessity of collaborative research in the

## Biomolecular Engineering

development of new sciences and technologies that are attentive to questions of ethics and justice. Enrollment by permission of instructor. Enrollment restricted to graduate students. (Also offered as Anthropology 267A. Students cannot receive credit for both courses.) Enrollment limited to 15. The Staff

### **268B. Science and Justice Research Seminar. \***

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): Sociology 268A, Biomolecular Engineering 268A, Feminist Studies 268A, or Anthropology 267A. Enrollment by permission of instructor. Enrollment restricted to graduate students. (Also offered as Anthropology 267B. Students cannot receive credit for both courses.) Enrollment limited to 15. The Staff

### **270. Drug Action and Development. \***

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.) (Also offered as Chemistry and Biochemistry 270. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. D. Smith, T. Holman, M.

Camps, R. Linington, P. Berman

### **280B. Seminar on Bioinformatics and Bioengineering (2 credits). F,W,S**

Weekly seminar series covering topics of current research in computational biology, and bioinformatics. Current research work and literature in these areas are discussed. (Formerly Seminar on Bioinformatics.) May be repeated for credit. The Staff

### **281A. Seminar on Processive Enzymes and Nanopores (2 credits). F,W,S**

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. Enrollment restricted to graduate students. Qualified undergraduates may enroll with permission of instructor. May be repeated for credit. M. Akesson

### **281B. HIV Vaccine Research (2 credits). F,S**

Weekly seminar series covering topics of HIV vaccine research. Current research work and literature in this area discussed. Students lead some discussions and participate in all meetings. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. Enrollment limited to 10. May be repeated for credit. P. Berman

### **281C. Seminar in Cancer Genomics (2 credits). F,W,S**

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. Enrollment restricted to graduate students. May be repeated for credit. D. Haussler, J. Stuart

### **281D. Seminar on Protein Engineering (2 credits). F,W,S**

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. Enrollment is restricted to graduate students. May be repeated for credit. R. Dubois

### **281E. Seminar in Genomics (2 credits). F,W,S**

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. Enrollment restricted to graduate students. May be repeated for credit. R. Green

### **281F. Blood Cell Development (2 credits). F,W,S**

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

## Biomolecular Engineering

some discussions and participate in all meetings. Enrollment restricted to graduate students.

Undergraduates may enroll with permission of instructor.

Enrollment limited to 10. May be repeated for credit. C. Forsberg

### **281H. Seminar in Comparative Genomics (2 credits). F,W,S**

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. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. May be repeated for credit. D. Haussler

### **281K. Seminar on Protein Structure Prediction (2 credits). F,W,S**

Weekly seminar series covering topics of current computational and experimental research in protein structure prediction. Current research work and literature in this area discussed. Students lead some discussions and participate in all meetings. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. May be repeated for credit. K. Karplus

### **281L. Seminar in Computational Genetics (2 credits). F,W,S**

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. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. May be repeated for credit. T. Lowe

### **281P. Seminar on Nanotechnology and Biosensors (2 credits). F,W,S**

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. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. May be repeated for credit. N. Pourmand

### **281S. Seminar in Computational Functional Genomics (2 credits). F,W,S**

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. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. May be repeated for credit. J. Stuart

### **281V. Immunogenomics Seminar (2 credits). F,W,S**

Journal club and research presentations in immunogenomics. Enrollment is by consent of the instructor and is restricted to graduate students, juniors, and seniors. C. Vollmers

### **293. Seminar in Biomolecular Engineering.**

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. Enrollment restricted to graduate

students; qualified undergraduates may enroll with permission of instructor. The Staff

### **296. Research in Bioinformatics. F,W,S**

Independent research in bioinformatics under faculty supervision. Although this course may be repeated for credit, not every degree program accepts a repeated course towards degree requirements. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **297. Independent Study or Research. F,W,S**

Independent study or research 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. May be repeated for credit. The Staff

### **297F. Independent Study or Research (2 credits). F,W,S**

Independent study or research 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. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **299. Thesis Research. F,W,S**

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. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised 09/01/15

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# COMPUTATIONAL MEDIA

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Baskin School of Engineering

(831) 459-2158

<http://www.soe.ucsc.edu>

[Faculty](#) | [Computational Media Course Descriptions](#) | [Games Courses](#)

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## PROGRAM DESCRIPTION

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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, as well as the master of science (M.S.) degree in games and playable media. Besides offering instructional courses, the department engages in a substantial research program in which both advanced undergraduates and graduate students participate.

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### B.S. COMPUTER SCIENCE: COMPUTER GAME DESIGN MAJOR REQUIREMENTS

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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 and art history, play experiences, and social and ethical issues. In their upper-division courses, students gain depth by taking upper-division electives in computational media, computer science, and computer engineering, with options such as game AI, mobile app development, game engine architecture, and interactive narrative. A two-course interdisciplinary game creation experience (usually taken at the end of the sophomore year) and a year-long interdisciplinary

capstone game design and development studio class allow students to develop substantial computer games and integrate materials from the rest of the program.

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### PROGRAM LEARNING OUTCOMES

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Recipients of a B.S. degree in computer game design at UCSC 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.
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### DECLARATION OF THE MAJOR

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First-year applicants may receive direct admission at the time they apply to UCSC based on their high school record and test scores. Admission to the major after a student has entered UCSC is based on the grades received in all foundation courses attempted at UCSC and will be considered no sooner than the student's second quarter. Students must receive a GPA of at least 2.80 in the foundation courses: a core programming sequence, Computer Engineering (CMPE) 16: Applied

## Computational Media

Discrete Mathematics, and a calculus sequence, which may be Mathematics 19A and 19B, or 20A and 20B.

Options for core programming include:

- Computer Science (CMPS) 5J, CMPS 11, and CMPS 12B/M;
- CMPS 12A/L and CMPS 12B/M;
- CMPE 13/L and CMPS 12B/M;
- CMPS 13H/L.

At most one unsuccessful attempt (grade C-, D+, D, D-, F, or NP) for a foundation course is permitted. Denials of admission to the major may be appealed by submitting a letter to the School of Engineering Undergraduate Office, addressed to the Computational Media Undergraduate Director. The appeal letter must describe why the prior performance is not an accurate reflection of the student's potential. Students who are informed that they are not eligible to declare the major after their first appeal may submit 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.

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### FOUNDATION COURSES

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The foundation courses are as follows:

CMPS 12A/L (or Computer Engineering 13/L, or both CMPS 5J and CMPS 11); CMPS 12B/M; and, CMPE 16; and Mathematics 19A and 19B, or 20A and 20B. CMPS 13H/L may be used instead of both CMPS 12A/L and 12B/M.

UCSC students that have completed three or more quarters at UCSC must complete the foundation courses before they can declare the major.

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### HONORS IN THE MAJOR

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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.

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### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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Students must satisfy the Disciplinary Communication (DC) requirement by successfully passing CMPM 170.

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### LETTER GRADE POLICY

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Please refer to the School of Engineering section of the catalog (subheading: [Letter Grade Policy](#)).

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## TRANSFER STUDENTS

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Most courses have a strong theoretical component to prepare the student for designing, as opposed to simply using, technical and game systems. Often, courses taken at other institutions which emphasize applications of current programming languages and authoring tools do not count toward the major at UCSC.

At UCSC, the core programming sequence — courses Computer Science (CMPS) 12A/L (or 5J and 11) and 12B/M (or 13H/L, which covers both 12A/L and 12B/M) — exposes students to both Java and C. Many upper-division courses that involve programming use the C and C++ programming languages. Transfer students who are not familiar with both Java and C may need to take a remedial course. Students familiar with C++ and Unix should find the transition to Java and C relatively simple.

Transfer students must have completed all of the core programming, computer systems, and mathematics courses (CMPS 12A/L and 12B/M, CMPE 12/L, CMPE 16, MATH 19 A and B, MATH 21/AMS 10), or their articulated equivalents. A student lacking one such course may be admitted if they have completed at least CMPE 12/L. It is highly recommended that all transfer students complete this course prior to admission.

To the extent possible, it is recommended that transfer students take the equivalents of additional major required courses beyond the core programming, computer systems, and mathematics courses. For transfer students only, any course focused on the history of modern art (after 1900 C.E.) may satisfy the HAVC 141 requirement. In addition, if students have access to courses that develop a foundation in building and understanding games and other forms of interactive media, these are valuable to take — and in some cases may be substituted for CMPM 80K, Foundations of Video Game Design, once they enter the program. Transfer students who are planning a course substitution for HAVC 141 or CMPM 80K should refer to the School of Engineering portion of the catalog (subheading [Course Substitutions](#)).

Finally, transfer students should have completed as many general education requirements as possible.

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### SCHOOL OF ENGINEERING POLICIES

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Please refer to the School of Engineering section of the catalog (subheading: [Admission to School of Engineering Majors](#)) 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.

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## PREPARATION FOR THE MAJOR

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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.

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## MAJOR REQUIREMENTS

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The curriculum has 24-26 courses (depending on core programming sequence taken). Fourteen 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.

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### LOWER- AND UPPER-DIVISION REQUIREMENTS

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Course requirements are divided into six conceptual areas and may not be credited in more than one area:

#### **Mathematics**

Complete all of the following courses:

Mathematics 19A-B, Calculus for Science, Engineering, and Mathematics (students can alternately take Mathematics 20A-B, Honors Calculus. Credit for one or both Mathematics 19A-B may be granted with adequate performance on the CEEB calculus AB or BC Advanced Placement examinations).

Mathematics 21, Linear Algebra, or Applied Mathematics and Statistics 10, Mathematical Methods for Engineers I

Computer Engineering 16, Applied Discrete Mathematics

#### **Computational Foundations**

Complete all of the following courses:

Computer Science 12A/L, Introduction to Programming (Accelerated)/Laboratory\* (or both Computer Science 5J and 11 or Computer Engineering 13/L)

Computer Science 12B/M, Introduction to Data Structures/Laboratory\*

Computer Engineering 12/L, Computer Systems and Assembly Language/Laboratory

Computer Science 109, Advanced Programming

Computer Science 101, Algorithms and Abstract Data Types

\*Computer Science (CMPS) 13H/L may be used instead of both CMPS 12A/L and 12B/M

#### **Arts Foundations**

Complete both of the following courses:

Art and Design: Games and Playable Media (ARTG) 80G, Visual Communication and Interaction Design and

History of Art and Visual Culture (HAVC) 141A Modern Art: Realism to Cubism, 141B Cubism to Pop, or 141C Pop to Present

#### **Games and Playable Media Foundations**

Complete all of the following courses:

Art and Design: Games and Playable Media 80H, History of Digital Games

Film and Digital Media 80V, Video Games as Visual Culture

#### **Game Design and Development**

Complete all of the following courses.

Computational Media 80K, Foundations of Video Game Design

Computational Media 120, Game Development Experience

Art and Design: Games and Playable Media 120, Game Design Experience

Computational Media 170, Game Design Studio I

Computational Media 171, Game Design Studio II (7 credits)

Computational Media 172, Game Design Studio III (7 credits)

Computational Media 176, Systems Design

#### **Computer Game Engineering**

Complete five courses from the following list:

Applied Mathematics and Statistics 131, Introduction to Probability Theory

Applied Mathematics and Statistics 147, Computational Methods and Applications

Computational Media 131, User Experience for Interactive Media

Computational Media 147, Generating Worlds

Computational Media 148, Interactive Storytelling

Computational Media 146, Game Artificial Intelligence

Computational Media 164/L, Game Engines/Laboratory

Computational Media 177, Creative Strategies for Designing Interactive Media

Computational Media 178, Human-Centered Design Research

## Computational Media

Computational Media 179, Game Design Practicum (may be repeated for credit; only the first offering counts toward the Computer Game Engineering requirement)

Computer Science 102, Introduction to Analysis of Algorithms

Computer Science 104A, Fundamentals of Compiler Design I

Computer Science 104B, Fundamentals of Compiler Design II

Computer Science 105, Systems Programming

Computer Science 111, Introduction to Operating Systems

Computer Science 112, Comparative Programming Languages

Computer Science 115, Software Methodology

Computer Science 116, Software Design Project

Computer Science 117, Software Design Project II

Computer Science 119, Software for Society

Computer Science 121, Mobile Applications

Computer Science 122, Computer Security

Computer Science 128, Distributed Systems, File Sharing, Online Gaming, and More

Computer Science 129, Data Storage Systems

Computer Science 130, Computational Models

Computer Science 132, Computability and Computational Complexity

Computer Science 140, Artificial Intelligence

Computer Science 142, Machine Learning and Data Mining

Computer Science 143, Natural Language Processing

Computer Science 160/L, Introduction to Computer Graphics/Laboratory

Computer Science 161, Introduction to Data Visualization

Computer Science 162, Advanced Computer Graphics and Animation

Computer Science 164/L, Game Engines/Laboratory

Computer Science 165, Data Programming for Visualization

Computer Science 166A, Game Theory and Applications I

Computer Science 180, Database Systems I

Computer Science 181, Database Systems II

Computer Science 183, Web Applications

Computer Engineering 110, Computer Architecture

Computer Engineering 112, Computer and Game Console Architecture

Computer Engineering 113, Parallel and Concurrent Programming

Computer Engineering 118/L, Introduction to Mechatronics/Laboratory

Computer Engineering 131, Human-Computer Interaction

Computer Engineering 150/L, Introduction to Computer Networks/Laboratory

### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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Students must satisfy the major's upper-division Disciplinary Communication (DC) requirement by completing the first course in the game design studio sequence CPM 170.

### COMPREHENSIVE REQUIREMENT

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Students satisfy the senior comprehensive requirement by receiving a passing grade in all three courses of the game design studio sequence.

## MAJOR PLANNERS

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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. Plan one is for a student entering UCSC in their frosh year who is prepared to go directly into Mathematics 19A/20A and Computer Science 12A/L. Plan two is for a student entering UCSC their frosh year who needs to take preparatory courses prior to Mathematics 19A or Computer Science 12A/L to ensure a successful outcome in those courses. The third plan is for a junior transfer student who has completed their mathematics, computational foundations, modern art history, and general education requirements.

Computational Media

**Plan One**

	Fall	Winter	Spring
<b>Year 1</b>	ARTG 80H (PE-T) MATH 19A College Core	CMPM 80K (IM) MATH 19B or 20B CMPS 12A/L (MF)	ARTG 80I (PE-H)* Composition 2 CMPS 12B/M
<b>Year 2</b>	ARTG 80G MATH 21 or AMS 10 CMPE 12/L	FILM 80V HAVC 141B CMPS 109	CMPM 120 (PR-E) ARTG 120 CMPE 16
<b>Year 3</b>	CMPS 101 CMPM 176 Elective / Gen Ed	Game Engineering 1 Game Engineering 2 Elective / Gen Ed	Game Engineering 3 Game Engineering 4 Elective / Gen Ed
<b>Year 4</b>	CMPM 170 (DC) Game Engineering 5 Elective / Gen Ed	CMPM 171 Elective / Gen Ed Elective / Gen Ed	CMPM 172 Elective / Gen Ed Elective / Gen Ed

\*ARTG 80I is recommended, but not required.

**Plan Two**

	Fall	Winter	Spring
<b>Year 1</b>	ARTG 80H (PE-T) MATH 3 (MF) College Core	CMPM 80K (IM) CMPS 5J MATH 19A	ARTG 80I (PE-H) CMPS 11 MATH 19B
<b>Year 2</b>	ARTG 80G CMPS 12B/M HAVC 141A	FILM 80V MATH 21 or AMS 10 CMPE 16	CMPM 120 (PR-E) ARTG 120 CMPS 109
<b>Year 3</b>	CMPS 101 CMPM 176 Elective / Gen Ed	Game Engineering 1 Game Engineering 2 CMPE 12/L	Game Engineering 3 Game Engineering 4 Elective / Gen Ed
<b>Year 4</b>	CMPM 170 (DC) Game Engineering 5 Elective / Gen Ed	CMPM 171 Elective / Gen Ed Elective / Gen Ed	CMPM 172 Elective / Gen Ed Elective / Gen Ed

**Plan Three**

	Fall	Winter	Spring
<b>Year 1 (Jr)</b>	ARTG 80H ARTG 80G Elective*	CMPM 80K FILM 80V CMPS 109	CMPS 101 CMPM 120 ARTG 120
<b>Year 2 (Sr)</b>	CMPM 170 (DC) CMPM 176 Game Engineering 1	CMPM 171 Game Engineering 2 Game Engineering 3	CMPM 172 Game Engineering 4 Game Engineering 5

\*Some transfer students need a prerequisite for CMPS 101, such as CMPE 16, for which this provides opportunity. Others may not have had the opportunity to fulfill other requirements, such as the HAVC 141 requirement, which this slot enables.

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## GRADUATE PROGRAM

### MASTER'S DEGREE IN GAMES AND PLAYABLE MEDIA

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The goal of the M.S. in games and playable media is to prepare 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 strong course offerings in games and related technologies on the Santa Cruz campus, as well as make connections with the department's field-leading research groups. The M.S. in games and playable media is a four-quarter program that begins in fall quarter and ends in the following summer. Students are expected to complete coursework in one academic year, without leaves of absence.

#### REQUIREMENTS FOR THE GAMES AND PLAYABLE MEDIA MASTER'S DEGREE

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##### Course Requirements

Each student is required to take 46 credits, though the game art, game writing, and game sound requirements will likely lead to more. Required courses are as follows:

- Games and Playable Media 221, 222, and 223; Professional Development for Game Makers 1, 2, and 3; 6 credits (2 credits each)
- CPM 265, Generative Methods, 5 credits
- Games and Playable Media 270, 271, and 272; Games and Playable Media Studio 1, 2, and 3; 15 credits (5 credits each)
- Games and Playable Media 273, Game Development Intensive (10 credits)
- Two courses from the game engineering electives list below, 10 credits, (5 credits each); can be upper-division undergraduate if appearing on approved list for games and playable media M.S. degree; often satisfied by taking CPM 265, Generative Methods and CPM 248, Interactive Storytelling.

Before entering the Game Development Intensive (Games and Playable Media 273), students must satisfy the game art, game writing, and game sound requirements, as described below:

- The game art requirement is satisfied by (a) having completed, with a grade of B- or better, two or more courses in a relevant area of art, at any institution,

at either the undergraduate or graduate level (such as courses CPM 25, and CPM 26); or (b) by satisfactorily completing (S or grade of A or B) course Games and Playable Media 210, Game Art Intensive; or (c) by submitting a portfolio of prior work in one or more areas and undergoing an examination to determine level of art proficiency.

- The game writing requirement is satisfied by (a) having completed, with a grade of B- or better, two or more courses in a relevant area of writing or interactive narrative (such as CPM 148, Interactive Storytelling), at any institution, at either the undergraduate or graduate level; or (b) by satisfactorily completing (S or grade of A or B) course CPM 248, Interactive Storytelling; or (c) by submitting a portfolio of prior work in one or more areas and undergoing an examination to determine level of game writing proficiency.
- The game sound requirement is satisfied by (a) having completed, with a grade of B- or better, two or more courses in a relevant area of music, sound effects, or game audio, at any institution, at either the undergraduate or graduate level; or (b) by satisfactorily completing course (S or grade of A or B) Games and Playable Media 215, Audio Direction; or (c) by submitting a portfolio of prior work in one or more areas and undergoing an examination to determine level of game sound proficiency.

#### PROJECT

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Completion of a master's 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 performed by students during Games and Playable Media 273, Game Development Intensive. 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 program director and the games and playable media creative director, and which may contain members of the games and playable media program faculty, or members of the games and playable media program advisory board, or other instructors in the games and playable media program.

## Computational Media

### GAME ENGINEERING ELECTIVES

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The following courses may be used to satisfy game engineering electives for the games and playable media M.S. degree:

#### **Graduate courses:**

CMPM 235: User Evaluation of Technology  
CMPM 244: Artificial Intelligence in Games  
CMPM 245: Computational Models of Discourse and Dialogue  
CMPM 248: Interactive Storytelling  
CMPM 265: Generative Methods  
CMPS 221: Advanced Operating Systems  
CMPS 223: Advanced Computer Security  
CMPS 229: Storage Systems  
CMPS 232: Distributed Systems  
CMPS 240: Artificial Intelligence  
CMPS 241: Knowledge Engineering  
CMPS 242: Machine Learning  
CMPS 253: Advanced Programming Languages  
CMPS 260: Computer Graphics  
CMPS 261: Advanced Visualization  
CMPS 262: Computer Animation  
CMPS 272: Evolutionary Game Theory  
CMPS 277: Principles of Database Systems  
CMPS 278: Design and Implementation of Database Systems  
Computer Engineering 202: Computer Architecture  
Computer Engineering 215: Models of Robotic Manipulation  
Computer Engineering 216: Bio-inspired Locomotion  
Computer Engineering 218: Mechatronics  
Computer Engineering 231: Human-Computer Interaction  
Computer Engineering 233: Human Factors  
Computer Engineering 248: Games in Design and Control  
Computer Engineering 250: Multimedia Systems  
Computer Engineering 253: Network Security  
Computer Engineering 263: Data Compression  
Computer Engineering 264: Image Analysis and Computer Vision.

#### **Upper-division undergraduate courses:**

CMPM 146: Game AI  
CMPM 148: Interactive Storytelling  
CMPM 164: Game Engines

CMPM 177: Creative Strategies for Designing Interactive Media  
CMPM 178: Human-Centered Design Research  
CMPM 179: Game Design Practicum  
CMPS 115: Software Methodology  
CMPS 119: Software for Society  
CMPS 122: Computer Security  
CMPS 128: Distributed Systems: File Sharing, Online Gaming, and More  
CMPS 130: Computational Models  
CMPS 140: Artificial Intelligence  
CMPS 142: Machine Learning and Data Mining  
CMPS 160: Introduction to Computer Graphics  
CMPS 161: Introduction to Data Visualization  
CMPS 162: Advanced Computer Graphics and Animation  
CMPS 165: Data Programming for Visualization  
CMPS 166A: Game Theory and Applications I  
CMPS 166B: Game Theory and Applications II  
CMPS 180: Database Systems I  
CMPS 181: Database Systems II  
CMPS 183: Web Applications  
CMPE 110: Computer Architecture  
CMPE 112: Computer and Game Console Architecture  
CMPE 118: Introduction to Mechatronics  
CMPE 131: Human-Computer Interaction.

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### TRANSFER CREDIT

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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.

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### REVIEW OF PROGRESS

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On an ongoing basis, the faculty reviews the progress of every student. Students not making adequate progress toward completion of degree requirements (see the

## Computational Media

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 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 adviser and the graduate director immediately. Students may appeal their dismissal.

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## COMPUTATIONAL MEDIA FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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#### **Katherine Isbister**

Games and human computer interactions, computer game character design, game user research

#### **Michael Mateas**

Artificial Intelligence (AI) for art and entertainment, game AI, AI and creativity, AI-based interactive storytelling, autonomous characters

#### **Marilyn Walker (joint with Computer Science)**

Dialogue systems, natural language processing, computer games, human-computer interaction, machine learning, artificial intelligence

#### **Noah Wardrip-Fruin**

Digital media, computer games, electronic literature, software studies

#### **E. James Whitehead Jr.**

Software engineering, software evolution, software bug

prediction, level design in computer games, procedural content generation

### ASSOCIATE PROFESSOR

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#### **Arnav Jhala**

Artificial Intelligence: storytelling in games, intelligent machinima generation, smart graphics, and intelligent user interfaces

#### **Sri Kurniawan (joint with Computer Engineering)**

Human-computer interaction; human factors and ergonomics; accessibility; assistive technology; usability; empirical studies; human-centered design



#### **Suresh K. Lodha (Computer Science)**

Data analytics and visualization, vision, innovation, technology for social good

#### **Warren Sack (Professor, Film and Digital Media)**

Theory and practice of digital media. Software design and media theory

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## COMPUTATIONAL MEDIA COURSES

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### LOWER-DIVISION COURSES

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#### **25. Introduction to 3D Modeling. F**

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. (Formerly Computer Science 25, Introduction to Computer Graphics: 3D Modeling.) (General Education Code(s): PR-C.) The Staff, C. Yonge, E. Whitehead

#### **26. Introduction to 3D Animation. W**

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

## Computational Media

assignments focused on the use of a 3D animation tool and use of motion-capture software. (Formerly Computer Science 26, Introduction to Computer Graphics: 3D Animation.) Prerequisite(s): Computer Science 25. (General Education Code(s): PR-C.) C. Yonge

### **80K. Foundations of Video Game Design. W**

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. (General Education Code(s): IM, T2-Natural Sciences.) N. Whitehead, N. Wardrip-Fruin, E. Whitehead

### **94. Group Tutorial. F,W,S**

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. May be repeated for credit. The Staff

### **94F. Group Tutorial (2 credits). F,W,S**

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. May be repeated for credit. The Staff

## UPPER-DIVISION COURSES

### **120. Game Development Experience. S**

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 Art 120G which covers the skills required to design and critique digital games.

(Formerly course 20, Game Design Experience.) Prerequisite(s): course 80K, Computer Science 12B and 12M, and Film and Digital Media 80V; Art and Design: Games and Playable Media 80H or 80I; and concurrent enrollment in Art and Design: Games and Playable Media 120. (General Education Code(s): PR-E, IN.) A. Jhala

### **131. User Experience for Interactive Media. W**

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(s): Computer Science 12B. Enrollment is restricted to juniors, seniors, and graduate students. Enrollment limited to 60. S. Kurniawan

### **146. Game AI. W**

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. (Formerly Computer Science 146.) Prerequisite(s): Computer Science 101; familiarity with C++. Enrollment restricted to sophomores, juniors, seniors, and graduate students. The Staff, A. Jhala, M. Mateas

### **148. Interactive Storytelling. F**

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. (Formerly Computer Science 148.) Prerequisite(s): Computer Science 101. Enrollment restricted to juniors and seniors. M. Mateas, A. Jhala, N. Wardrip-Fruin

### **164. Game Engines. S**

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. (Formerly Computer Science 164.) Prerequisite(s): Computer Science 160 and 160L. Concurrent enrollment in course 164L required. A. Jhala

### **164L. Game Engines Lab (2 credits). S**

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. (Formerly Computer Science 164L.) Concurrent enrollment in course 164 required. A. Jhala

### **170. Game Design Studio I. F**

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.

## Computational Media

Includes design reviews and formal presentations. Companion lectures cover advanced topics in game design, game programming, and software project management. Students are billed a materials fee. (Formerly Computer Science 170.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; courses 120, 80K, and Computer Science 101 and 109, and two from the computer game electives.

Enrollment restricted to Computer science: computer game design majors. The Staff, N. Wardrip-Fruin, M. Mateas, E. Whitehead

### **171. Game Design Studio II (7 credits). W**

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 course 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.

Students are billed a materials fee. (Formerly Computer Science 171.) Prerequisite(s): course 170. Enrollment restricted to computer science: computer game design majors. E. Whitehead, N. Wardrip-Fruin, M. Mateas

### **172. Game Design Studio III (7 credits). S**

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. Students are billed a materials fee. (Formerly Computer Science 172.) Prerequisite(s): course 171. Enrollment restricted to Computer science:computer game design major. E. Whitehead, A. Jhala, N. Wardrip-Fruin, M. Mateas

### **176. Game Systems. S**

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(s): course 80K. E. Whitehead, N. Wardrip-Fruin, M. Mateas

### **177. Creative Strategies for Designing Interactive Media. F**

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. (Formerly Computer Science 177.) Enrollment restricted to juniors and seniors. B. Laurel, N. Wardrip-Fruin

### **178. Human-Centered Design Research. W**

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. (Formerly Computer Science 178.) Enrollment restricted to juniors, seniors, and graduate students. (General Education Code(s): PR-C.) E. Whitehead, B. Laurel, N. Wardrip-Fruin

### **179. Game Design Practicum. \***

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. (Also offered as Art&Des:Games&PlayableMedia 179. Students cannot receive credit for both courses.) Prerequisite(s): course 20 or Computer Science 20 and course 80K or Computer Science 80K. May be repeated for credit. (General Education Code(s): PR-C.) The Staff, E. Whitehead, M. Walker, N. Wardrip-Fruin, A. Jhala, M. Mateas

### **194. Group Tutorial. F,W,S**

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. May be repeated for credit. The Staff

### **194F. Group Tutorial (2 credits). F,W,S**

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. May be repeated for credit. The Staff

**195. Senior Thesis Research. F,W,S**

Students submit a petition to the sponsoring agency. Prerequisite(s): satisfaction of the Entry Level Writing requirement. The Staff

**195F. Senior Thesis Research (2 credits). F,W,S**

Intended for majors. Students submit a petition to the sponsoring agency. Prerequisite(s): satisfaction of the Entry Level Writing requirement. The Staff

**198. Individual Study or Research. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**198F. Individual Study or Research (2 credits). F,W,S**

Intended for majors. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199. Tutorial. F,W,S**

For fourth-year students majoring in computational media. Students submit a petition to the sponsoring agency. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S**

For fourth-year students majoring in computational media. Students submit a petition to the sponsoring agency. May be repeated for credit. The Staff

**GRADUATE COURSES**

**235. User Evaluation of Technology. F**

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. (Formerly

Computer Engineering 235.)

Enrollment restricted to graduate students. Seniors may enroll with completion of Computer Science 131. The Staff

**244. Artificial Intelligence in Games. W**

Artificial intelligence has long used game-playing as a metric for progress. Key algorithms such as alpha-beta and HPA search studied. Computer algorithms for backgammon, poker, and chess examined. There will be individualized projects. (Formerly Computer Science 244.)

Prerequisite(s): course 201; and course 211 or 240 or 242. Enrollment limited to 20. A. Jhala, M. Mateas

**245. Computational Models of Discourse and Dialogue. W**

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. (Formerly Computer Science 245.) (Also offered as Linguistics 245. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. Undergraduates may enroll with permission of instructor. May be repeated for credit. M. Walker

**248. Interactive Storytelling. S**

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. (Formerly Computer Science 248.) Enrollment restricted to graduate students. Enrollment limited to 20. N. Wardrip-Fruin, M. Mateas

**265. Generative Methods. W**

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. (Formerly Computer Science 265.) Enrollment restricted to graduate students. M. Mateas, E. Whitehead

**280W. Seminar in Digital Media (2 credits).**

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. (Formerly Computer Science 280W.) Enrollment restricted to graduate students. May be repeated for credit. N. Wardrip-Fruin

**280X. Expressive AI (2 credits). F,W,S**

Weekly seminar covering topics of current research in artificial intelligence applied to interactive

## Computational Media

art and entertainment, including computer games. Enrollment by permission of instructor. Enrollment restricted to graduate students. (Formerly Computer Science 280X.) Enrollment limited to 30. May be repeated for credit. N. Wardrip-Fruin, M. Mateas

### **280Z. Seminar in Natural Language Processing and Dialogue (2 credits). F,W,S**

Covers advanced topics and current research in natural language processing. Focuses on student presentations and seminar participation. (Also offered as Computer Science 280Z. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. May be repeated for credit. M. Walker

### **290J. Playable Media. W,S**

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. (Formerly Computer Science 290J.) (Also offered as Digital Arts and New Media 250D. Students cannot receive credit for both courses.) May be repeated for credit. N. Wardrip-Fruin

### **290P. Topics in Computational Cinematography. \***

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. (Formerly Computer Science 290P.)

(Also offered as Digital Arts and New Media 290P. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. A. Jhala

### **297. Independent Study or Research. F,W**

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. May be repeated for credit. The Staff

### **299. Thesis Research. F,W,S**

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. May be repeated for credit. The Staff

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## GAMES AND PLAYABLE MEDIA COURSES

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### GRADUATE COURSES

#### **210. Game Art Intensive. F**

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. Enrollment restricted to games and playable media graduate students; others by interview. The Staff

#### **215. Audio Direction. W**

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. Enrollment restricted to games and playable media graduate students. E. Whitehead, A. Romero, B. Romero

#### **221. Professional Development for Game Makers I (2 credits). F**

First course in a three-course sequence covering the game industry, game jobs, current thinking on games, and becoming a professional game maker. Focuses on presenting yourself and your ideas. Includes elements of writing, speaking, and designing professional communication. Enrollment restricted to games and playable media graduate students; others by interview. The Staff

#### **222. Professional Development for Game Makers II (2 credits). W**

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. Enrollment restricted to games and playable media graduate students. E. Whitehead, A. Romero, B. Romero

**223. Professional Development for Games Makers III (2 credits). S**

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. Enrollment restricted to games and playable media graduate students. E. Whitehead, B. Romero, N. Wardrip-Fruin

**270. Game and Playable Media Studio I. F**

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. Enrollment

restricted to games and playable media graduate students; others by interview. The Staff

**271. Games and Play Media Studio II. W**

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(s): course 270. Enrollment restricted to games and playable media graduate students. N. Wardrip-Fruin, E. Whitehead

**272. Game and Playable Media Studio III. S**

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. Enrollment restricted to graduate students in the games and playable media program. E. Whitehead, A. Romero, N. Wardrip-Fruin

**273. Game Production Intensive (10 credits). S**

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. Enrollment restricted to graduate students in the games and playable media program. E. Whitehead, A. Romero, N. Wardrip-Fruin

\* Not offered in 2015-16

Revised 09/01/15

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# COMPUTER ENGINEERING

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2015-16 General Catalog

Baskin School of Engineering

(831) 459-2158

<http://www.soe.ucsc.edu>

[Faculty](#) | [Course Descriptions](#)

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## PROGRAM DESCRIPTION

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Computer engineering focuses on the design, analysis, and application of computers and on their applications as components of systems. The UCSC Department of Computer Engineering sustains and strengthens its teaching and research program to provide students with inspiration and quality education in the theory and practice of computer engineering. The department offers the bachelor of science (B.S.) in computer engineering, the bachelor of science in robotics engineering, the bachelor of arts (B.A.) in digital and network technology, the master of science (M.S.) and the doctor of philosophy (Ph.D.) in computer engineering degrees as well as an undergraduate minor. A combined B.S./M.S. program allows students to complete both the B.S. and M.S. in computer engineering degrees in five years. The department administers the interdisciplinary graduate designated emphasis in robotics and control that may be pursued along with a graduate degree in computer engineering or another field such as applied mathematics and statistics or electrical engineering.

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### UNDERGRADUATE PROGRAM DESCRIPTION

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The department offers two bachelor of science majors, one in computer engineering and the other in robotics engineering. The department also offers a bachelor of arts in network and digital technology. The programs are closely related with many common requirements, so that students do not need to immediately decide among the three.

The two undergraduate engineering degrees have the same program objectives for their graduates. The program objectives of the UCSC B.S. in computer engineering and B.S. in robotics engineering are:

1. Graduates who choose to pursue a career in industry, government, or academia will become successful engineers, scientists, or educators who demonstrate strong leadership, technical, and team skills; and a commitment to continuing professional development.

2. Graduates who choose to pursue advanced degrees will gain admission to graduate programs and will be successful graduate students.

The UCSC B.S. in computer engineering prepares graduates for a rewarding career in engineering. UCSC computer engineering graduates will have 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 five specialized concentrations for completing the program: systems programming, computer systems, robotics and control, networks, and digital hardware.

Descriptions of these concentrations follow in the section on major requirements.

The UCSC B.S. in robotics engineering prepares graduates for a rewarding career 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.

The UCSC 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 either B.S. program.

## Computer Engineering

The Department of Computer Engineering offers an undergraduate minor, described after the B.A. program below. The minor in computer engineering focuses on the technical aspects of computer hardware, embedded systems, and software design. This minor is particularly recommended for students interested in the design of computer technology for use in another discipline.

The Department co-sponsors the B.S. in bioengineering with the Departments of Biomolecular Engineering, Electrical Engineering, and Molecular, Cell and Developmental Biology.

Beyond the extensive research, design, and development projects taking place within courses required for the major, many computer engineering students join faculty-led research projects to take part in cutting-edge research. The department sponsors the summer undergraduate research fellowship in information technology (SURF-IT), as well as many other research opportunities. The department holds regular faculty-undergraduate lunches to discuss research and other issues of interest.

Many computer engineering students continue their education through the M.S. degree. The Department of Computer Engineering offers a combined B.S./M.S. program in computer engineering that enables eligible undergraduates to move without interruption to the graduate program. Interested computer engineering and robotics engineering majors should contact their adviser for more details. The graduate program of the Department of Computer Engineering also offers both the standard M.S. and the Ph.D. degrees.

The computer engineering B.S. program is accredited by The Engineering Accreditation Commission of ABET, <http://www.abet.org>.

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### PROGRAM LEARNING OUTCOMES

The program learning outcomes (PLO) of each of the three degrees in computer engineering are subsets of the ABET Student Outcomes. The ABET Student Outcomes are published at:

<http://ce.soe.ucsc.edu/ABET>. For the computer engineering and robotics engineering B.S. degree, the PLOs 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, such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
- an ability to function on multi-disciplinary teams;
- an ability to identify, formulate, and solve engineering problems;

- an ability to communicate effectively;
- the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
- a recognition of the need for, and the ability to engage in, life-long learning;
- a knowledge of contemporary issues; and
- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

For the BANDT (B.A. in network and digital technology) program the PLOs 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 communicate effectively; and
- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

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### COURSES FOR NONMAJORS

The Department of Computer Engineering offers course Computer Engineering 1, Hands-on Computer Engineering, a two-credit laboratory course designed to introduce students to computer engineering via many short fun projects; course Computer Engineering 3, Personal Computer Concepts: Software and Hardware, providing students an introductory course on the design and use of computers from an engineering viewpoint; and Computer Engineering 8, Robot Automation: Intelligence through Feedback Control. Other computer engineering courses of interest to nonmajors include Computer Engineering 12, Computing Systems and Assembly Language, an introductory course on computer systems, system software, and machine-level programming; Computer Engineering 80N, Introduction to Networking and the Internet, an introduction to technological services of the Internet; Computer Engineering 80E, Engineering Ethics; and Computer Engineering 80A, Universal Access: Disability, Technology, and Society.

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### COMPUTER ENGINEERING POLICIES

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#### ADVISING FOR PROPOSED MAJORS

Students interested in pursuing any of the department's three majors but not yet ready to declare should have their status updated to reflect the associated proposed major. They should also visit the Baskin School of Engineering undergraduate advising office to plan a course of study that will allow them to complete any of the department's three majors as well as preserve their

## Computer Engineering

options for other majors that might be of interest. Computer engineering proposed majors will be assigned a faculty adviser on request and invited to School of Engineering and Computer Engineering advising events. Please note that students who are proposed majors still need to follow the procedure for declaring one of the three majors as describe below; a student may not graduate as a proposed major.

### DECLARATION OF THE COMPUTER ENGINEERING MAJORS

Declaration of the computer engineering major in the first six quarters of enrollment at UCSC is based on performance in the CE Major Qualification Courses: Mathematics 19A, Mathematics 19B, Mathematics 23A, Applied Mathematics and Statistics 10 or Mathematics 21 (whichever is completed first), Applied Mathematics and Statistics 20, Computer Engineering 12/L, Computer Engineering 13/L, Computer Engineering 16, Computer Science 12B/M, Physics 5A/L and Physics 5C/N. Students in their first six quarters who have completed at least 36 credits in these courses will be admitted to the computer engineering major if:

1. their cumulative grade point average 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.

All other applications for admission to the major in the first six quarters of enrollment will be reviewed individually to ensure the major can be completed within the campus limits. After the first six quarters petitions to declare the major are reviewed individually to ensure the major can be completed within the campus limits. Students seeking to change their current major to computer engineering in their seventh through ninth quarters who have completed the four upper-division classes and associated labs, Computer Engineering 100/L, Computer Engineering 107, Computer Science 101 and Electrical Engineering 101/L with a cumulative grade point average of at least 2.50 or greater and have completed all of the lower-division courses listed above by their ninth quarter will also be admitted.

Declaration of the robotics engineering major in the first six quarters of enrollment at UCSC is based on performance in the following lower-division courses and associated labs required for the major: Mathematics 19A, Mathematics 19B, Mathematics 23A, Applied Mathematics and Statistics 10 or Mathematics 21 (whichever is completed first), Applied Mathematics

and Statistics 20, Computer Engineering 9, Computer Engineering 12/L, Computer Engineering 13/L, Computer Engineering 16, Computer Science 12B/M, Physics 5A/L and Physics 5C/N. Students in their first six quarters who have completed at least 41 credits in these courses will be admitted to the computer engineering major if

1. their cumulative grade point average is at least 2.8 among the courses listed above; and
2. they have attempted no more than 7 credits resulting in grades of C-, D+, D, D-, F or NP in all of the courses listed above.

All other applications for admission to the major in the first six quarters of enrollment will be reviewed individually to ensure the major can be completed within the campus limits. After the first six quarters petitions to declare the major are reviewed individually to ensure the major can be completed within the campus limits. Students seeking to change their current major to robotics engineering in their seventh through ninth quarters who have completed the five upper-division classes and associated labs, Computer Engineering 100/L, Computer Engineering 107, Computer Science 101, Electrical Engineering 101/L and Electrical Engineering 103/L with a cumulative grade point average of at least 2.50 or greater and have completed all of the lower-division courses listed above will also be admitted.

Declaration of the network and digital technology major is based on performance in the following lower-division courses and associated labs required for the major: Math 19A, Math 19B, Math 23A, Applied Mathematics and Statistics 10 or Mathematics 21 (whichever is completed first), Applied Mathematics and Statistics 20 or Mathematics 24 (whichever is completed first), Computer Engineering 12/L, Computer Engineering 13/L, Computer Engineering 16, Computer Science 12B/M, Physics 5A/L or Physics 6A/L and Physics 5C/N or Physics 6C/N. Students in their first six quarters who have completed at least 36 credits in these courses with a cumulative grade point average of at least 2.30 or greater will be admitted to the network and digital technology major. After the first six quarters petitions to change a students major to network and digital technology are reviewed individually to ensure the major can be completed within the campus limits. 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 grade point average of at least 2.30.

Denials of admission to the major may be appealed by submitting a letter to the School of Engineering

## Computer Engineering

Undergraduate Office, addressed to the Computer Engineering Undergraduate Director, describing why the grade point average obtained is not an accurate reflection of the student's potential.

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### TRANSFER STUDENTS

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Admission to the Computer Engineering Major and Robotics Engineering Major for transfer students is based on performance in all attempts at courses transferable to UCSC as Mathematics 19A, Mathematics 19B, Mathematics 23A, Applied Mathematics and Statistics 10 or Mathematics 21, Applied Mathematics and Statistics 20, Computer Engineering 12/L, Computer Engineering 13/L, Computer Engineering 16, Computer Science 12B/M, Physics 5A/L and Physics 5C/N. Before they transfer, students must complete Physics 5A/L, Physics 5C/M, Mathematics 19A, Mathematics 19B and at least one of the following three: Mathematics 23A, Applied Mathematics and Statistics 10 or Mathematics 21, Applied Mathematics and Statistics 20. In addition, completion of at least one programming course (even if not articulated) is required.

Admission to the Network and Digital Technology Major for transfer students is based on performance in all attempts at courses transferable to UCSC as Mathematics 19A, Mathematics 19B, Mathematics 23A, Applied Mathematics and Statistics 10 or Mathematics 21, Applied Mathematics and Statistics 20 or Mathematics 24, Computer Engineering 12/L, Computer Engineering 13/L, Computer Engineering 16, Computer Science 12B/M, Physics 5A/L or Physics 6A/L and Physics 5C/N or Physics 6C/N. Before transferring students must have completed at least 5 of these courses and their associated labs including at least one programming course (even if the programming course is not articulated).

Students should consult [assist.org](http://assist.org) to determine which courses at other institutions in California are transferable to UCSC.

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### ADVISING

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Every major and minor must have a computer engineering faculty adviser, assigned by the Baskin School of Engineering undergraduate advising office, and with that adviser must formulate a program of proposed coursework that meets the major or minor requirements. Additional information can be found on the [SOE web pages](#).

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### RESTRICTIONS ON DOUBLE MAJORS AND MINORS

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Students completing any of the department's three majors cannot also receive the computer engineering minor.

Students completing the Robotics Engineering B.S. or the Computer Engineering BS cannot receive the Network and Digital Technology B.A. degree.

Students completing the Robotics Engineering B.S. can receive the Computer Engineering B.S. as well only by completing a concentration other than Robotics and Control.

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### HONORS IN THE MAJOR

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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 and robotics 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.

#### Letter Grade Policy

The Computer Engineering Department requires letter grading for all courses applied towards any of its three undergraduate degrees: the B.S. in computer engineering, the B.S. in robotics engineering and the B.A. in network and digital technology. This policy includes courses required for these degrees that are sponsored by other departments.

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### SCHOOL OF ENGINEERING POLICIES

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Please refer to the School of Engineering section of the catalog for additional policies that apply to all School of Engineering programs.

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### MATERIALS FEE AND MISCELLANEOUS FEES

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Please see the section on fees under the School of Engineering.

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### REQUIREMENTS OF THE COMPUTER ENGINEERING MAJOR

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All students in the computer engineering major take the same core courses, which give the fundamentals of

## Computer Engineering

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 senior comprehensive requirement for computer engineering majors is satisfied by completion of the capstone course and the exit requirement.

### LOWER-DIVISION CORE REQUIREMENTS

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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.

Applied Mathematics and Statistics 10, Mathematical Methods for Engineers I; or Mathematics 21, Linear Algebra

Applied Mathematics and Statistics 20, Mathematical Methods for Engineers II;

Computer Engineering 12/L, Computer Systems and Assembly Language/Laboratory

Computer Engineering 13/L, Computer Systems and C Programming/Laboratory

Computer Science 12B/M, Introduction to Data Structures/Laboratory

Computer Engineering 16, Applied Discrete Mathematics

Mathematics 19A-B, Calculus for Science, Engineering, and Mathematics

Mathematics 23A, Multivariable Calculus

Physics 5A/L, Introduction to Physics I /Laboratory;

Physics 5B/M, Introduction to Physics II/Laboratory; or Computer Engineering 9, Statics, Dynamics, and Biomechanics (recommended for robotics and control concentration).

Physics 5C/N, Introduction to Physics III/Laboratory;

Computer Engineering 80E, Engineering Ethics; or another approved ethics course. This course is required even for transfer students who have had their general education requirements waived.

### UPPER-DIVISION CORE REQUIREMENTS

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Computer Engineering 100/L, Logic Design/Laboratory

Computer Engineering 107, Mathematical Methods of Systems Analysis: Stochastic

Computer Engineering 110, Computer Architecture

Computer Engineering 121/L, Microprocessor System Design/Laboratory

Computer Engineering 185, Technical Writing for Computer Engineers

Computer Science 101, Abstract Data Types

Electrical Engineering 101/L, Introduction to Electronics/Laboratory

Electrical Engineering 103/L, Signals and Systems/Laboratory

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## CONCENTRATIONS

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The following concentrations are specializations for the computer engineering student. Students must complete all of the courses listed within their selected concentration.

### SYSTEMS PROGRAMMING CONCENTRATION

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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 Science 111, Introduction to Operating Systems

Computer Science 115, Software Methodology

Computer Engineering 150/L, Introduction to Computer Networks/Laboratory

Elective: Upper-division or graduate elective from the approved list

Any one of the following courses:

Computer Engineering 113, Parallel and Concurrent Programming

Computer Engineering 156/L, Network Programming/Laboratory

Computer Science 104A, Fundamentals of Compiler Design I

### COMPUTER SYSTEMS CONCENTRATION

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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.

Computer Engineering 125/L, Logic Design with Verilog/Laboratory

## Computer Engineering

Computer Science 109, Advanced Programming; or  
Computer Science 115, Software Methodology

Computer Science 111, Introduction to Operating  
Systems

Elective: Upper-division or graduate elective from the  
approved list

### ROBOTICS AND CONTROL CONCENTRATION

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This concentration covers the hardware, software,  
sensing, and control aspects of autonomous and  
embedded systems. Students receive training in the  
theory, design, and realization of complex systems such  
as mobile robots. The concentration emphasizes  
integration of embedded software with hardware  
systems that interact with the environment.

Any two of the following:

Computer Engineering 118/L, Introduction to  
Mechatronics/Laboratory

Computer Engineering 167/L, Sensing and Sensor  
Technologies/Laboratory

Computer Engineering 141, Feedback Control Systems

Elective: Upper-division or graduate elective from the  
approved list

Third course from above (Computer Engineering  
118/L, Computer Engineering 167/L, Computer  
Engineering 141); or any one of the following courses:

Computer Engineering 115, Solid Mechanics (requires  
prerequisite)

Computer Engineering 153, Digital Signal Processing  
Applied Mathematics and Statistics 114, Introduction to  
Dynamical Systems

Computer Engineering 215, Models of Robotic  
Manipulation

Computer Engineering 216, Bio-Inspired Locomotion

Computer Engineering 240, Introduction to Linear  
Dynamical Systems

Computer Engineering 242, Applied Feedback Control

Computer Engineering 244, Digital Control

Computer Engineering 264, Image Analysis and  
Computer Vision

### NETWORKS CONCENTRATION

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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.

Computer Engineering 150/L, Introduction to  
Computer Networks/Laboratory

Computer Engineering 156/L, Network  
Programming/Laboratory

Computer Science 111, Introduction to Operating  
Systems

Elective: Computer Engineering 151/L, Advanced  
Computer Networks/Laboratory; or an upper-division  
or graduate elective from approved list.

### DIGITAL HARDWARE CONCENTRATION

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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.

Computer Engineering 125/L, Logic Design with  
Verilog/Laboratory

Electrical Engineering 171/L, Analog  
Electronics/Laboratory

Elective: Upper-division or graduate elective from  
approved list

Any one of the following courses:

Computer Engineering 122, Introduction to VLSI Digital  
System Design

Electrical Engineering 173/L, High-Speed Digital  
Design/Laboratory (requires prerequisite)

Computer Engineering 202, Computer Architecture

Computer Engineering 222, Advanced VLSI Digital  
System Design

### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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Students of every major must satisfy that major's  
upper-division Disciplinary Communication (DC)  
requirement. The DC requirement in computer  
engineering is satisfied by completing Computer  
Engineering 185, Technical Writing for Computer  
Engineers.

### CAPSTONE REQUIREMENT

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All computer engineering students complete either the  
two-quarter capstone project sequence Computer  
Engineering 123A/B, or the three-quarter capstone  
project sequence Computer Engineering 129A/B/C or a  
senior thesis along with the first capstone course.

One of the following sequences:

## Computer Engineering

Computer Engineering 123A, Computer Engineering Design Project I and Computer Engineering 123B, Computer Engineering Design Project II;

Computer Engineering 123A, Computer Engineering Design Project I and Computer Engineering 195, Senior Thesis Research

Computer Engineering 129A, Capstone Project I; and Computer Engineering 129B, Capstone Project II; and Computer Engineering 129C, Capstone Project III

Computer Engineering 129A, Capstone Project I and Computer Engineering 195, Senior Thesis Research

### EXIT REQUIREMENT

Students are required to submit a portfolio, complete the exit survey, and attend an exit interview. Students whose submissions are deemed inadequate, either in presentation or in content, may be required to revise and rewrite the portfolio or to complete an additional project course. The portfolios must be turned in electronically by the last day of the quarter of graduation. The online form can be found on the [computer engineering web pages](#).

The portfolios will be reviewed quarterly by the computer engineering undergraduate committee and must include the following:

- A hardware-oriented project report;
- A software-oriented project report;
- A third project report of the student's selection;
- and any additional information related to these projects requested.

If a project report is associated with a course, it must be an upper-division (other than CMPE100/L) or graduate course. One of the reports must be the result of a multi-person project. One of the reports must be the result of an individual project. One of the reports must be the result of the student's capstone design project.

Exit interviews are scheduled during the last week of the quarter.

### COMPUTER ENGINEERING MAJOR PLANNERS

The following are two sample academic plans for students to complete during their first two years as preparation for the computer engineering major. Plan One is suggested guidelines for students who are committed to the major early in their academic career. Plan Two is for students who are considering the major. Students who take pre-calculus at UCSC, or who have little programming experience, are strongly advised to take course 8, Robot Automation in the fall quarter.

Plan One			
Year	Fall	Winter	Spring
1st (frsh)	MATH 19A	MATH 19B	CMPE 80E
	CMPE 12/L	CMPE 13/L	CMPS 12B/M
	core course	gen ed	MATH 23A
2nd (soph)	PHYS 5A/L	AMS 20	PHYS 5C/N
	AMS 10	CMPE 107	CMPE 100/L
	CMPE 16	PHYS 5B/M	CMPS 101

Plan Two			
Year	Fall	Winter	Spring
1st (frsh)	MATH 3 (pre-calc)	MATH 19A	MATH 19B
	CMPE 8	CMPE 12/L	CMPE 13/L
	core course	gen ed	CMPE 80E
2nd (soph)	PHYS 5A/L	CMPE 100/L	PHYS 5C/N
	CMPS 12B/M	CMPE 9	MATH 23A
	AMS 10	AMS 20	CMPE 16

### REQUIREMENTS OF THE ROBOTICS ENGINEERING MAJOR

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 Computer Engineering 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. The robotics engineering major requires two more courses than the computer engineering major, including one graduate course. Students not making sufficient progress in the major may be required to change to another major.

### LOWER-DIVISION CORE REQUIREMENTS

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.

Applied Mathematics and Statistics 10, Mathematical Methods for Engineers I; or Mathematics 21 Linear Algebra

## Computer Engineering

Applied Mathematics and Statistics 20, Mathematical Methods for Engineers II

Computer Engineering 12/L, Computer Systems and Assembly Language/Laboratory

Computer Engineering 13/L, Computer Systems and C Programming/Laboratory

Computer Science 12B/M, Introduction to Data Structures/Laboratory

Computer Engineering 16, Applied Discrete Mathematics

Mathematics 19A-B, Calculus for Science, Engineering, and Mathematics

Mathematics 23A, Multivariable Calculus

Physics 5A/L, Introduction Physics /Laboratory I

Physics 5C/N, Introduction Physics III/Laboratory

Computer Engineering 9, Statics, Dynamics, and Biomechanics

Computer Engineering 80E, Engineering Ethics; or another approved ethics course. This course is required even for transfer students who have had their general education requirements waived.

### Upper-Division Core Requirements

Computer Engineering 100/L, Logic Design/Laboratory

Computer Engineering 107, Mathematical Methods of Systems Analysis: Stochastic

Computer Engineering 115, Solid Mechanics

Computer Engineering 118/L, Introduction to Mechatronics/Laboratory

Computer Engineering 121/L, Microprocessor System Design/Laboratory

Computer Engineering 141, Feedback Control Systems

Computer Engineering 167/L, Sensing and Sensor Technologies/Laboratory

Computer Engineering 185, Technical Writing for Computer Engineers

Computer Science 101, Abstract Data Types

Electrical Engineering 101/L, Introduction to Electronics/Laboratory

Electrical Engineering 103/L, Signals and Systems/Laboratory

Elective: Upper-division or graduate elective from approved list.

Advanced Robotics Elective (One of the following courses):

Computer Engineering 215, Models of Robotic Manipulation

Computer Engineering 216, Bio-Inspired Locomotion

Computer Engineering 240, Introduction to Linear Dynamical Systems

Computer Engineering 242, Applied Feedback Control

Computer Engineering 244, Digital Control

Computer Engineering 264, Image Analysis and Computer Vision.

### Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in robotics engineering is satisfied by completing Computer Engineering 185, Technical Writing for Computer Engineers.

### Capstone Requirement

All robotics engineering students complete either the two-quarter capstone project sequence Computer Engineering 123A/B, or the three-quarter capstone project sequence Computer Engineering 129A/B/C or a senior thesis along with the first capstone course:

One of the following sequences:

Computer Engineering 123A, Computer Engineering Design Project I and Computer Engineering 123B, Computer Engineering Design Project II;

Computer Engineering 123A, Computer Engineering Design Project I and Computer Engineering 195, Senior Thesis Research

Computer Engineering 129A, Capstone Project I; and Computer Engineering 129B, Capstone Project II; and Computer Engineering 129C, Capstone Project III

Computer Engineering 129A, Capstone Project I and Computer Engineering 195, Senior Thesis Research

### Exit Requirement

Students are required to submit a portfolio, complete the exit survey and attend an exit interview. Students whose submissions are deemed inadequate, either in presentation or in content, may be required to revise and rewrite the portfolio or to complete an additional project course. The portfolios must be turned in electronically by the last day of the quarter of graduation.

The portfolios will be reviewed quarterly by the computer engineering undergraduate committee and must include three project reports of the student's selection and any additional information related to these projects requested. The online portfolio form can be found on the [computer engineering web pages](#). If a project report is associated with a course, it must be an upper-division (other than Computer Engineering 100/L) or graduate course. One of the reports must be the result of a multi-person project. One of the reports

## Computer Engineering

must be the result of an individual project. One of the reports must be the result of the student's capstone design project.

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### ROBOTICS ENGINEERING MAJOR PLANNER

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<b>Year</b>	<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
1st (frsh)	MATH 19A	MATH 19B	MATH 23A
	CMPE 8 core course (C1)	CMPE 12/L gen ed (C2)	CMPE 13/L CMPE 80E
2nd (soph)	PHYS 5A/L	CMPE 9	PHYS 5C/N
	AMS 10	CMPE 185	CMPE 100/L
3rd (jr)	CMPS 12B/L	AMS 20	CMPE 16
	EE 101/L	SOE elective	CMPE 115
	CMPS 101/L	CMPE 107	CMPE 121/L
4th (sr)	gen ed	gen ed	EE 103/L
	CMPE 141	CMPE 129B	CMPE 129C
	CMPE 129A	CMPE 167/L	CMPE 215
	CMPE 118/L	gen ed	gen ed

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### NETWORK AND DIGITAL TECHNOLOGY MAJOR REQUIREMENTS

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All students in the network and digital technology major must take the following courses. The senior comprehensive requirement is satisfied by completion of the capstone course and the portfolio exit requirement.

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#### LOWER-DIVISION REQUIREMENTS

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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.

Applied Mathematics and Statistics 10, Mathematical Methods for Engineers I; or Mathematics 21, Linear Algebra

Applied Mathematics and Statistics 20, Mathematical Methods for Engineers II; or Mathematics 24, Ordinary Differential Equations

Computer Engineering 12/L, Computer Systems and Assembly Language/Laboratory

Computer Engineering 13/L, Computer Systems and C Programming/Laboratory

Computer Science 12B/M, Introduction to Data Structures/Laboratory

Computer Engineering 16, Applied Discrete Mathematics

Mathematics 19A-B, Calculus for Science, Engineering, and Mathematics

Mathematics 23A, Multivariable Calculus

Physics 5A/L, Introduction Physics /Laboratory I; or Physics 6A/L, Introductory Physics I/Laboratory

Physics 5C/N, Introduction Physics III/Laboratory; or Physics 6C/N, Introductory Physics III/Laboratory

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#### UPPER-DIVISION REQUIREMENTS

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Computer Engineering 100/L, Logic Design/Laboratory

Computer Engineering 150/L, Computer Networks/Laboratory

Computer Engineering 185, Technical Writing for Computer Engineers

Computer Science 101, Abstract Data Types; or Electrical Engineering 101/L, Introduction to Electronics/Laboratory

Three additional 5-credit upper-division electives, and associated laboratories, from the approved list of electives, and one capstone requirement course.

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#### CAPSTONE REQUIREMENT

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Each capstone course features a 3-month supervised design experience in digital or network technology culminating in a substantial written report. Computer Engineering 185, Technical Writing for Computer Engineers, must be completed prior to or concurrently with the capstone project course. Students must notify the instructor at the start of the quarter that they are working to complete their B.A. in Digital Technology Capstone Requirement. Students select one of the following:

Computer Engineering 118/L, Introduction to Mechatronics/Laboratory

Computer Engineering 121/L, Microprocessor System Design/Laboratory

Computer Engineering 125/L, Logic Design with Verilog/Laboratory

Computer Engineering 151/L, Advanced Computer Networks/Laboratory

Computer Engineering 156/L, Network Programming/Laboratory

Computer Science 115, Software Methodology

## Computer Engineering

### ELECTIVE CHOICE

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Students wishing to focus on digital technology should consider including among their courses: Electrical Engineering 101/L, Computer Engineering 110, Computer Engineering 118/L, Computer Engineering 121/L, and Computer Engineering 125/L.

Students wishing to focus on network technology should consider including among their courses: Computer Science 101, Computer Engineering 151/L, Computer Engineering 156/L, and Computer Science 111.

In all cases, students should discuss their interests and elective choices with their faculty adviser.

### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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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 Computer Engineering 185, Technical Writing for Computer Engineers.

### EXIT REQUIREMENT

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Students are required to submit a portfolio and complete the exit. Students whose submissions are deemed inadequate, either in presentation or in content, may be required to revise and rewrite the portfolio or to complete an additional project course. The portfolios must be turned in electronically by the last day of the quarter of graduation. The online form can be found on the [computer engineering web pages](#). The portfolios will be reviewed quarterly by the computer engineering undergraduate committee and must include the project report of the student's capstone course.

### NETWORK AND DIGITAL TECHNOLOGY MAJOR PLANNER

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The first year is similar to option 2 for the computer engineering major. Students choosing between the B.S. and the B.A. program should follow the B.S. curriculum until major declaration. General education courses needed outside major requirements are not shown.

Year	Fall	Winter	Spring
1st (frsh)	MATH 3 (pre-calc)	MATH 19A	MATH 19B
	CMPE 8 (opt)	CMPE 12/L	CMPE 13/L
2nd (soph)	CMPE 16	CMPE 100/L	CMPS 12B/M
	PHYS 5A/L	MATH 23A	PHYS 5C/N
3rd (jr)	CMPE 150/L	Elective	Elective
	AMS 10	AMS 20	
4th (sr)	EE 101/L	Elective	Capstone
	CMPE 185		

### COMPUTER ENGINEERING MINOR

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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 Engineering 118/L, Introduction to Mechatronics/Introduction to Mechatronics Laboratory or Computer Engineering 121/L, Microprocessor System Design/Microprocessor System Design Laboratory provides a capstone engineering design experience for students pursuing the computer engineering minor.

### COMPUTER ENGINEERING MINOR REQUIREMENTS

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Requirements for the minor in computer engineering are the following:

Applied Mathematics and Statistics 20A or 20, (Basic) Mathematical Methods for Engineers II (requires prerequisite); or Mathematics 24, Ordinary Differential Equations

Computer Engineering 12/L, Computer Systems and Assembly Language/Laboratory

Computer Engineering 16, Applied Discrete Mathematics

Computer Engineering 100/L, Logic Design/Laboratory

Computer Engineering 110, Computer Architecture

Computer Engineering 118/L Introduction to Mechatronics/Laboratory or 121/L, Microprocessor System Design/Laboratory

Computer Engineering 13/L, Computer Systems and C Programming (recommended); or Computer Science 12A/L, Introduction to Programming (Accelerated)/Laboratory; or Computer Science 5J, Introduction to Programming in Java, and Computer Science 11, Intermediate Programming

## Computer Engineering

Computer Science 12B/M, Introduction to Data Structures/Laboratory

Computer Science 101, Abstract Data Types

Electrical Engineering 101/L, Introduction to Electronics/Laboratory

Mathematics 19A-B, Calculus for Science, Engineering, and Mathematics

Physics 5A/L, Introduction to Physics I/Laboratory; or Physics 6A/L, Introductory Physics I/Laboratory

Physics 5C/N, Introduction to Physics III/Laboratory; or Physics 6C/N, Introductory Physics III/Laboratory

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### B.S./M.S. UNDERGRADUATE PROGRAM

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The Department of Computer Engineering offers a combined bachelor and master of science degree program. Undergraduate students in computer engineering, robotics engineering, electrical engineering, and computer science can apply to the program in order to earn a B.S. degree in their own major together with an M.S. degree in computer engineering. Depending on the student's progress, the B.S./M.S. program can be completed in five years.

The B.S./M.S. program offers a competitive edge to students who are completing their undergraduate degree at UCSC, by enabling those with advanced preparation to move directly from the undergraduate to the graduate program. The program 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 just seven courses beyond the B.S. program in either of the allowed majors.

The program 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 has many opportunities for undergraduate research, and B.S./M.S. students can continue their undergraduate research projects with the same research group. Upon advancement to graduate standing, B.S./M.S. students are eligible for financial support as graduate research assistants and teaching assistants.

Particularly motivated B.S./M.S. students can complete the entire program in 14 quarters (or fewer with Advanced Placement credit); however, advance planning is essential. Interested students should contact the department and their faculty adviser early in their college career—no later than the start of their junior year. B.S./M.S. students retain undergraduate

status until the completion of all undergraduate requirements, but may begin graduate coursework in advance of graduate standing.

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### ADMISSION TO THE B.S./M.S. PROGRAM

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The undergraduate degree requirements are the same as those for other computer engineering, robotics engineering, electrical engineering, and computer science majors; however, the B.S./M.S. program capitalizes on graduate-level courses that may apply toward both degree requirements. B.S./M.S. candidates may use (at most) two graduate courses taken as undergraduates toward both the M.S. degree and B.S. degree electives. At the time graduate status is achieved, no more than three graduate courses taken as an undergraduate may count toward the nine courses required for the M.S. degree. Furthermore, B.S./M.S. students may not apply undergraduate courses toward the M.S. degree.

Admission to the B.S./M.S. program is by formal application, but is very simple. Undergraduate applicants seeking admission to the program can apply at any time starting in the first quarter of junior standing, and no graduate record examination (GRE) is required to apply. To qualify, applicants must have a 3.0 GPA when they apply to the B.S./M.S. program, and must maintain a 3.0 GPA or higher until the completion of their undergraduate requirements.

Students who cannot meet the B.S./M.S. application requirements or who are not admitted into the program are encouraged to apply for admission to the standard M.S. or Ph.D. program during their senior year.

Additional information about this program can be found on the [department's web pages](#).

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## GRADUATE PROGRAMS

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### M.S. AND PH.D. DEGREE PROGRAMS

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The graduate program in computer engineering accepts students for both the M.S. and the Ph.D. degrees. Graduate students in this program establish a solid foundation in computer algorithms and architectures and then proceed to a thorough study of recent developments in their selected area of specialization. This provides the basis for the M.S. degree and Ph.D. thesis work. The major areas of research concentration in computer engineering at UCSC are computer networks; embedded and autonomous systems; computer systems design; robotics and control, mobile and pervasive computing; and computer-aided design; and sensing and interaction.

The computer engineering program benefits from a close relationship with other graduate programs in the

## Computer Engineering

School of Engineering and UCSC as a whole. It maintains strong ties to local industry in the Silicon Valley and Monterey Bay areas. Graduates of the program are prepared for careers in academia and research as well as for positions in industrial research and development.

While in the program, most graduate students are supported as research assistants on faculty-sponsored projects or as teaching assistants for undergraduate courses.

Additional information on the computer engineering M.S. and Ph.D. degrees, including degree requirements and applications for admission, can be found on the department's web pages

at <http://ce.soe.ucsc.edu/academics/graduate/requirements>.

### BASE REQUIREMENT (FOR BOTH M.S. AND PH.D)

In their first year, graduate students (both M.S. and Ph.D.) must show proficiency in three fundamental subjects: 1) computer algorithms and data structures; 2) computer architecture; and 3) one of the following three subjects—logic design, circuits, or software systems. Proficiency can be demonstrated by either completing one of the associated undergraduate courses, by establishing that an equivalent undergraduate course has been completed elsewhere, or by passing the final examination (or project when deemed appropriate by the responsible faculty) of an associated course. Students should obtain a computer engineering base requirement worksheet for the list of associated courses and instructions on fulfilling this requirement.

All graduate students (both M.S. and Ph.D.) must meet the base requirement by the end of the spring quarter of their first year in the program.

### REQUIREMENTS FOR THE MASTER'S DEGREE THESIS TRACK

#### Course Requirements

Each M.S. student is required to complete a total of at least 48 credits. The coursework must include:

1. Completion of base requirement as described above.
2. Core requirements:
  - Computer Engineering 200, Research and Teaching in Computer Science and Engineering (to be taken in fall quarter of the first year)
  - Computer Science 201, Analysis of Algorithms
  - Computer Engineering 202, Computer Architecture

3. Research credits: Up to 10 credits of Computer Engineering 297, Independent Study or Research; or Computer Engineering 299, Thesis Research
4. Up to 10 credits of either graduate courses (not seminars) in related disciplines outside the School of Engineering (requires adviser and computer engineering graduate director approval) or upper-division undergraduate courses when necessary to strengthen the student's preparation for graduate studies (requires adviser approval).
5. All remaining courses must be regular 5-credit graduate courses from within the School of Engineering (with adviser and grad director approval); courses that do not count include all courses numbered 200, 280, 296, 297, and 299.

At least half of the credits from the graduate-level courses must be computer engineering graduate courses.

### THESIS

Completion of a master's thesis is required for award of the master's degree. To fulfill this requirement, the student must submit a written proposal to a faculty member, usually by the third academic quarter. By accepting the proposal, the faculty member becomes the thesis adviser for the proposed thesis. In consultation with the adviser, the student must form a master's thesis reading committee with at least two additional faculty members, each of whom is provided a copy of the proposal. It is recommended that the student give an expository talk on the thesis research. The approved reading committee must accept the final thesis before the master of science degree can be awarded.

### REQUIREMENTS FOR THE MASTER'S DEGREE PROJECT TRACK

#### Course Requirements

Each student is required to complete a total of at least 48 credits. The coursework must include:

1. Completion of base requirement as describe above.
2. Core requirements:
  - Computer Engineering 200, Research and Teaching in Computer Science and Engineering (to be taken in Fall quarter of first year)
  - Computer Science 201, Analysis of Algorithms
  - Computer Engineering 202, Computer Architecture

## Computer Engineering

- Computer Engineering 296, Master's Project, 2 credits;
3. Up to 10 credits of either graduate courses (not seminars) in related disciplines outside the School of Engineering (requires adviser and computer engineering graduate director approval) or upper-division undergraduate courses when necessary to strengthen the student's preparation for graduate studies (requires adviser approval).
  4. All remaining courses must be regular, 5-credit graduate courses from within the School of Engineering (with adviser's and grad director's approval); courses that do not count include all courses numbered 200, 280, 296, 297, and 299.

At least half of the credits from the graduate-level courses must be computer engineering graduate courses.

### Project

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Completion of a master's project is required to satisfy the master's degree capstone requirement. The master's project is the culmination of the student's academic experience and builds upon the knowledge acquired during the program. In consultation with the adviser, the student forms a master's project reading committee of at least two faculty members, each of whom is provided a copy of the project report. The final project must be accepted by the review committee before the award of the master of science degree.

## REQUIREMENTS FOR THE PH.D. DEGREE

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### COURSE REQUIREMENTS

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A Ph.D. student is required to take a total of 58 credits of graduate courses, which must consist of:

1. Completion of base requirement as describe above
2. Core requirements:
  - Computer Engineering 200, Research and Teaching in Computer Science and Engineering (to be taken in fall quarter of the first year)
  - Computer Science 201, Analysis of Algorithms
  - Computer Engineering 202, Computer Architecture
3. Research credits: Up to 10 credits of Computer Engineering 297, Independent Study or Research; or Computer Engineering 299, Thesis Research
4. Up to 10 credits of graduate courses (not seminars) in related disciplines outside the School of

Engineering (requires adviser and computer engineering graduate director approval).

5. All remaining credits must be regular, 5-credit graduate courses from within the School of Engineering (with adviser and computer engineering graduate director approval); credits that do not count include all courses numbered 200, 280, 296, 297, and 299. At least 20 credits of these remaining courses must be Computer Engineering courses.

Course selection should form a coherent plan of study and requires adviser approval. Undergraduate courses may not be used to satisfy Ph.D. course requirements.

Ph.D. students who have satisfied the requirements for the master's degree are eligible to receive a master's degree.

### INTERNSHIPS

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Where appropriate, research internships with companies, research organizations, or government labs are recognized as an integral part of the research leading to the Ph.D. dissertation. At the adviser's discretion, internships in an appropriate company, research organization, or government lab may be required for individual students.

### EXAMINATIONS AND DISSERTATION

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To continue in the Ph.D. program, students must pass a preliminary examination in their chosen research area by the end of their third year. Preliminary examinations are held during the first three weeks of each spring quarter; students must petition the computer engineering graduate committee for an examination in their chosen area two weeks before the end of winter quarter.

Examination committees consist of four faculty members, two chosen by the student and two by the computer engineering graduate director. The format of this oral examination is up to the examination committee; the examination will typically evaluate both general knowledge of the chosen area and specific understanding of selected technical papers. The preliminary examination requirement is waived for students who advance to candidacy by the end of their third year.

Each student must write a Ph.D. dissertation. The dissertation must show the results of in-depth research, by an original contribution of significant knowledge, and include material worthy of publication. As the first step, a student must submit a written dissertation proposal to a School of Engineering faculty member. By accepting the proposal, the faculty member becomes the student's dissertation supervisor. The student may

## Computer Engineering

choose a faculty member outside the Computer Engineering Department within the School of Engineering as adviser only with approval from the computer engineering graduate director. The dissertation proposal is publicly and formally presented in an oral qualifying examination given by a qualifying examination committee, approved by the computer engineering graduate director and the graduate division. The student must submit his or her written dissertation proposal to all members of the qualifying examination committee and the graduate adviser at least one month in advance of the examination.

Students are advanced to candidacy after they have completed the course requirements, passed both the preliminary and qualifying examinations (or just the qualifying examination if passed prior to the end of the student's third year in the program), cleared all Incomplete grades from their records, have an appointed dissertation reading committee, and paid the filing fee. Students who have not advanced to candidacy by the end of their fourth year will be placed on academic probation.

Each Ph.D. candidate must submit the completed dissertation to a 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 must present 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 and attending faculty 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.

### TRANSFER CREDIT

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Up to three School of Engineering courses fulfilling the degree requirements of either the M.S. or Ph.D. degrees may be taken before beginning the graduate program through the concurrent enrollment program.

M.S. students who have previously successfully completed graduate-level classes in a related field at another institution may substitute courses from their previous institution with the approval of the graduate director. The number of courses that can be substituted is limited so that, in all cases, students must complete a minimum of four graduate-level classes during their matriculation at UCSC. These classes must be School of Engineering graduate-level courses and must be approved by the student's advisor and the computer engineering graduate director.

Petitions for course substitutions 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 UCSC.

Ph.D. students who have previously earned a master's degree or have successfully completed graduate-level classes as regular students in a graduate program in a related field at another institution may apply for a modified program of course requirements taking into account their previous coursework. Such a modified program should specify the coursework that will be completed at UCSC, which must include no fewer than four graduate-level courses and must be approved by the student's adviser and the computer engineering graduate director. These four courses must be taken while in the graduate program at UCSC.

Application for a modified program of course requirements must be made within the first year of graduate study at UCSC, and will be reviewed by the graduate director and a committee of three faculty members approved by the graduate director. Copies of the syllabi, exams, other relevant coursework, and the relevant transcript from the other institution, must accompany the application. Interviews with the committee members may be required to properly assess the coursework.

Acceptance of prior work for course transfer and modified programs of study is at the discretion of the department.

### ROBOTICS AND CONTROL DESIGNATED EMPHASIS

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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 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 and Statistics, Computer Engineering and Electrical Engineering, 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 Computer Engineering web site, [ce.soe.ucsc.edu](http://ce.soe.ucsc.edu).

## Requirements for the Designated Emphasis Notation

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**Committee composition.** The student's Ph.D. or M.S. committee must include one member of the robotics and control faculty.

**Writing.** 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.

**Course requirements.** The student must complete four five-credit graduate courses and several two-credit seminar courses. All students must complete CMPE 241/EE 241, Introduction to Feedback Control Systems, and three 5-credit robotics and control graduate electives.

Master's students must complete two offerings of CMPE 280C, Seminar in Control (2 credits).

Doctoral students must complete four offerings of CMPE 280C.

### Review of Progress

Each year, computer engineering faculty reviews the progress of every student in the graduate program. Students not making adequate progress towards completion of degree requirements (see the UCSC 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. Full-time students must complete Computer Science 201 and Computer Engineering 202 within two years and normally must complete all course requirements within two years for the M.S. and three years for the Ph.D. program.

Students receiving two or more grades of U (Unsatisfactory) or below B in 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 of a quarter of enrollment.

Should any computer engineering graduate student fail a School of Engineering course while on probation, the 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.

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## COMPUTER ENGINEERING FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**Alexandre Brandwajn, Emeritus**

**Gabriel Elkaim**

Embedded systems; robust software architectures for real-time reactive systems; sensor fusion; guidance, navigation, and control (GNC) system identification; robust and advanced control schemes; feedback control systems; robotics; unmanned autonomous vehicles (UAVs); and cooperative control

**F. Joel Ferguson**

Fault diagnosis, failure analysis, logic fault modeling, digital test pattern generation, design-for-test of digital circuits and systems

**J. J. García-Luna-Aceves (joint with Technology Management)**

**Jack Baskin Chair of Computer Engineering**

Principles of computer communication, Internet, mobile and pervasive computing, wireless networks, information-centric networks, network science

**Richard Hughey (joint with Biomolecular Engineering)**

Bioinformatics, hidden Markov models, computer architecture, parallel computation

**Tracy Larrabee**

Test-pattern simulation and generation, fault modeling, fault diagnosis, design verification, technical writing, logic simulation

**Roberto Manduchi**

Computer vision and sensor processing, with application to assistive technology for the visually impaired, mobile and pervasive computing

**Patrick E. Mantey (joint with Technology Management)**

**Jack Baskin Chair of Computer Engineering**

Multimedia systems, digital signal processing, sensor systems and networks, real-time monitoring and control, image systems, image processing, visualization, geographic information systems, decision support systems

**Katia Obraczka**

Computer networks, distributed systems, operating systems, Internet information systems, mobile computing, wireless networks, mobile and pervasive computing

**Martine D. F. Schlag**

VLSI design tools and algorithms, VLSI theory, field-programmable gate arrays, FPGA-based computing engines

**Anujan Varma**

Computer networking, computer architecture, optical networks

ASSOCIATE PROFESSOR

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**Pak K. Chan, Emeritus**

**William Dunbar**

Theory and application of feedback control, single molecule biophysics, nanopore sensors, dynamics and control of biomolecules

**Matthew R. Guthaus**

Health sensor systems, digital health, mobile health applications, integrated circuits and chip design (VLSI), electronic computer-aided design (ECAD), low-power circuits, mobile and pervasive computing

**Sri Kurniawan (joint with Computational Media)**

Human-computer interaction; human factors and ergonomics; accessibility; assistive technology; usability; empirical studies; human-centered design

**Dejan Milutinović**

Stochastic and nonlinear control, optimization, stochastic processes and estimation, hybrid and discrete event systems, signal processing and real-time computer control with applications to robotics, air-traffic and multi-agent systems

**Jose Renau**

Computer architecture, including design effort metrics and models, infrared thermal measurements and modeling, simulation, FPGA/ASIC design, mobile and pervasive computing

**Ricardo Sanfelice**

Modeling, stability, control, estimation, and simulation of nonlinear and hybrid systems with applications to autonomous vehicles, power systems, and biology

ASSISTANT PROFESSOR

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**Jishen Zhao**

Computer architecture with an emphasis on memory systems

**Adjunct Professor**

**Victoria Bellotti**

Focus on user-centered design of context- and activity-aware computing systems

**Gano Chatterji**

Air traffic management simulation and decision support system development, flight dynamics, estimation, guidance, navigation and control

**Renwick Curry**

Control and optimization with special attention to aviation; air-traffic control; and collision-avoidance system design and analysis

**Harwood G. Kolsky, Retired**

**Bassam Musaffar**

Air traffic management (ATM), unmanned traffic management (UTM), computer vision, pattern recognition, robotics and automation, fuzzy logic, neural networks, data and sensor fusion and control systems

**Associate Adjunct Professor**

**Michael Drew**

Air traffic management operations modeling and analysis, system theory, dynamics and control, time series and frequency analysis of traffic data

**Seung Man Lee**

Air traffic management and unmanned aircraft systems, application of cognitive systems engineering methodologies for the design, analysis, and evaluation of complex socio-technical systems, agent-based modeling and simulation, human-automation interaction, computational human performance modeling and analysis.

**Waqar Malik**

Air traffic management, motion planning and control of unmanned vehicles, fixed structure controller synthesis

**Bradley Smith**

Computer communications, distributed systems, policy-based routing, routing protocols, security and trust in distributed systems

**Mircea Teodorescu**

Dynamics, vibrations, contact mechanics, biomechanics

ASSISTANT ADJUNCT PROFESSOR

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**Bruce Sawhill**

Self-organizing systems, distributed control, dynamic scheduling, many-agent systems, agent-based simulation, game theory, computational logic, dynamics of social and economic networks, foundation of nonequilibrium economics

**Cedric Westphal**

Internet architecture, information-centric network, content and video distribution, wireless networks, analytical modeling, mobile and pervasive computing

LECTURER

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**Gerald Moulds**

Technical writing, professional communications



**Luca De Alfaro (Computer Science)**

Reputation systems, crowdsourcing, game theory, formal methods

**Benjamin Friedlander (Electrical Engineering)**

Digital communications, wireless communication system, array processing, adaptive signal processing

**Qi Gong (Applied Mathematics and Statistics)**

Computational methods for real-time control systems, trajectory optimization and motion planning, nonlinear filtering and observer design, robust and adaptive control of nonlinear systems, industry applications of control theory

**Claire Gu (Electrical Engineering)**

Fiber sensors for bio-applications, optical fiber communications, volume holographic data storage, liquid crystal displays, nonlinear optics, optical information processing

**Kevin Karplus (Biomolecular Engineering)**

Genome assembly from next-generation sequence data. (Formerly protein structure prediction), signal processing and statistics for nanopore signals

**Suresh K. Lodha (Computer Science)**

Data analytics and visualization, vision, innovation, technology for social good

**Darrell D. E. Long (Computer Science)**

**Kumar Malavalli Endowed Chair in Storage Systems**

Data storage systems, distributed computing, operating systems, performance evaluation, reliability, cyber security, data science, multimedia

**Dominic W. Massaro, Emeritus**

**Charles E. McDowell (Computer Science)**

Programming languages, parallel computing, and computer science education

**Ethan L. Miller (Computer Science)**

**Symantec Presidential Chair for Storage and Security**

Archival storage; non-volatile memory and next-generation storage; storage security and reliability; file system metadata and search, computer security; scalable and distributed systems

**John Musacchio (Technology Management)**

Control, analysis, and pricing of communications networks; applications of game theory in networking; wireless ad-hoc networks; and management of technology

**Alex T. Pang (Computer Science)**

Uncertainty visualization, tensor visualization, scientific visualization, comparative visualization, collaboration software, virtual reality interfaces

**Ira Pohl, Emeritus (Computer Science)**

**Hamid Sadjadpour (Electrical Engineering)**

Wireless communication systems, network information theory and scaling laws, performance analysis of wireless and social networks, routing and MAC protocol design for wireless networks

**Patrick Tantalo (Computer Science)**

Graph theory, combinatorics, optimization, algorithms

**Linda Werner (Computer Science)**

Software engineering, computer-science education, testing, increasing diversity in computer science

**E. James Whitehead, Jr. (Computational Media)**

Software engineering, software evolution, software bug prediction, level design in computer games, procedural content generation

**Donald Wiberg, Emeritus (UCLA)**

Control systems, Kalman filtering, system parameter estimation, adaptive optics for large telescopes, and biomedical system modeling

**Yi Zhang (Technology Management)**

Large-scale information retrieval, recommendation systems, internet advertising, data mining, language processing, and applied machine learning

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## COMPUTER ENGINEERING COURSES

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**LOWER-DIVISION COURSES**

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**1. Hands-On Computer Engineering (2 credits). \***

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. Enrollment restricted to first-year students and sophomores. Enrollment limited to 20. The Staff

**3. Personal Computer Concepts: Software and Hardware. F,W,S**

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

## Computer Engineering

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. (General Education Code(s): IN.) G. Moulds

### **7. Statistical Reasoning in the Age of the Internet.**

Elementary methods of statistical and probabilistic reasoning are introduced through applications from the Internet. Computer simulations and analyses performed by the instructor are presented to develop and discuss these methods. Students experiment with their own simulations (programming skills not required), analyzing and interpreting results. Students cannot receive credit for this course if they have already received credit for course 107 or Applied Mathematics and Statistics 5 or 7 or 131. Prerequisite(s): Applied Mathematics and Statistics 2 or 3 or 6, or Mathematics 3. (General Education Code(s): SR.) The Staff

### **8. Robot Automation: Intelligence through Feedback Control. F**

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. Priority enrollment restricted to first-year students and sophomores. (General Education Code(s): MF, IN, Q.) M. Teodorescu

### **9. Introduction to Statics, Dynamics, and Biomechanics. W**

Theory and application of mathematical models to analyze statics and dynamics of mechanical

and biomechanical systems (partials and rigid bodies) using a vector algebra. Covers: Newton's laws; free-body diagrams; structure analysis; friction; virtual work; energy and momentum methods; dynamics of bodies in two and three dimensions. Prerequisite(s): Mathematics 19A, and Physics 5A/L or 6A/L., and Applied Mathematics and Statistics 10 or Mathematics 21. D. Milutinovic

### **12. Computer Systems and Assembly Language. F,W,S**

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 system software, and computer architecture. May include C language. Students with no prior programming experience are strongly recommended to take course 3, Computer Science 5J, Computer Science 5P, Computer Science 10, or equivalent before taking this course. Prerequisite(s): previous or concurrent enrollment in course 12L is required. (General Education Code(s): IN, Q.) M. Dunne, J. Renau Ardevol

### **12L. Computer Systems and Assembly Language Laboratory (2 credits). F,W,S**

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 system software, and computer architecture. May include C language. Students with no prior programming experience are strongly recommended to take course 3, Computer Science 5J, Computer Science 5P, Computer Science 10, or equivalent before taking this course. Prerequisite(s):

previous or concurrent enrollment in course 12 is required. M. Dunne, J. Renau Ardevol

### **13. Computer Systems and C Programming. W,S**

Introduction to the C programming language as a means for controlling embedded and general computing systems. Continuing the exploration begun in course 12, students move to higher levels of abstraction in the control of complex computer systems. Prerequisite(s): courses 12 and 12L. Concurrent enrollment in course 13L is required. The Staff, M. Dunne, G. Elkaim

### **13L. Computer Systems and C Programming Lab (2 credits). W,S**

Laboratory sequence in C programming for embedded and general computing systems. Two 2-hour laboratories per week. Concurrent enrollment in course 13 is required. G. Elkaim, M. Dunne, (F) The Staff

### **16. Applied Discrete Mathematics. F,W,S**

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(s): Mathematics 19A or 11B or Applied Mathematics and Statistics 11B or 15B or Economics 11B. (General Education Code(s): MF, Q.) M. Schlag, T. Larrabee

**80A. Universal Access: Disability, Technology, and Society. F**

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 Assistive Technology and Universal Access.) (General Education Code(s): PE-T, T7-Natural Sciences or Social Sciences.) S. Kurniawan, R. Manduchi

**80E. Engineering Ethics. S**

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. (General Education Code(s): PE-T, T6-Natural Sciences or Humanities and Arts.) S. Kurniawan, The Staff

**80H. History of Modern Computing. \***

Presents a history of the development of computing technologies (CPUs and I/O devices, operating systems, and languages) through the latter half of the 20th century in order to build an understanding of how today's computing environment evolved. (General Education Code(s): T2-Natural Sciences.) The Staff

**80N. Introduction to Networking and the Internet. F,W,S**

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 course 150 cannot receive credit for this course. (General Education Code(s): PE-T, T2-Natural Sciences.) T. Larrabee, The Staff

**80U. Ubiquitous and Mobile Computing. \***

Ubiquitous computing integrates computer and communication technology with day-to-day life. Ubiquitous and mobile technology includes: MP-3 players, camera cell phones, Bluetooth headsets, sensor networks, and new emerging technologies. Course provides an overview of the technology and economics of ubiquitous computing. (General Education Code(s): T2-Natural Sciences.) The Staff

**94. Group Tutorial. F,W,S**

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. May be repeated for credit. The Staff

**94F. Group Tutorial (2 credits). F,W,S**

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. May be repeated for credit. The Staff

**99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**99F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**UPPER-DIVISION COURSES**

**100. Logic Design. W,S**

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(s): courses 12 and 12L; previous or concurrent enrollment in course 100L required. Enrollment limited to 60. J. Zhao, M. Schlag

**100L. Logic Design Laboratory (2 credits). W,S**

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. Students are billed a materials fee. Prerequisite(s): courses 12 and 12L; previous or concurrent enrollment in course 100 required. Enrollment limited to 60. J. Zhao, M. Schlag

**107. Probability and Statistics for Engineers. W,S**

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.

## Computer Engineering

(Formerly Mathematical Methods of Systems Analysis: Stochastic.)

Prerequisite(s): course 16 or 16H and Mathematics 22 or 23A. (General Education Code(s): SR.) J. Garcia-Luna-Aceves

### **108. Data Compression. \***

Basics of information theory, lossless coding (Huffman coding, arithmetic coding, dictionary coding), lossy coding (PCM, predictive coding, transform coding). Application to the compression of specific data set, which may include biological time series, DNA sequences, and multimedia streams. Programming experience is required.

Prerequisite(s): course 107 or Applied Mathematics and Statistics 131. The Staff

### **110. Computer Architecture. F,W**

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(s): courses 12/L, and courses 13/L or Computer Science 12A/L or Computer Science 11. Course 16 recommended. J. Zhao, J. Renau Ardevol

### **112. Computer and Game Console Architecture. \***

Introduces computer and game

console architecture, including examples of current approaches and the effect of technology and software. Computer performance evaluation; instruction-set architectures; RISC CPU and pipelining; cache and memory; multi-core, system-level architecture; video card; special console architectures. Pre-requisite(s): course 12. The Staff

### **113. Parallel and Concurrent Programming. \***

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. (Also offered as Computer Science 113. Students cannot receive credit for both courses.) Prerequisite(s): Computer Engineering 12 and 12L and Computer Science 101. Computer Engineering 110 or 112 recommended. The Staff

### **115. Introduction to Solid Mechanics. S**

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. Prerequisite(s): course 9 and Mathematics 19B, and Applied Mathematics and Statistics 10 or Mathematics 21. M. Teodorescu

### **118. Introduction to Mechatronics. F**

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. Cannot receive credit for this course and course 218. Prerequisite(s): Electrical Engineering 101/L and courses 12/L and 100/L. Concurrent enrollment in course 118L is required. Enrollment limited to 36. G. Elkaim

### **118L. Introduction to Mechatronics Laboratory (2 credits). F**

Laboratory sequence illustrating topics covered in course 118. Two 2-hour laboratory sessions per week. Students cannot receive credit for this course and course 218L. Students are billed a materials fee. Prerequisite(s): Concurrent enrollment in course 118 is required. Enrollment limited to 36. G. Elkaim

### **121. Microprocessor System Design. F,S**

The design and use of microprocessor-based 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. Enrollment restricted to Computer Engineering and Robotics majors during First Pass Enrollment. Prerequisite(s): courses 12/L and 100/L and Electrical Engineering

## Computer Engineering

101/L; and course 13/L or Computer Science 12B/M. Previous or concurrent enrollment in course 121L required. Enrollment limited to 40. A. Varma

### **121L. Microprocessor System Design Laboratory (2 credits). F,S**

Laboratory sequence illustrating topics covered in course 121. Two 2-hour laboratory sessions per week. Students design, build, program, debug, document, and demonstrate a microprocessor-based system. Students are billed a materials fee. Prerequisite(s): courses 12/L and 100/L and Electrical Engineering 101/L; and course 13/L or Computer Science 12B/M. Previous or concurrent enrollment in course 121 required. Enrollment limited to 40. A. Varma

### **122. Introduction to VLSI Digital System Design. S**

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 course 222. Prerequisite(s): courses 100/L and Electrical Engineering 101/L. Enrollment limited to 25. M. Guthaus

### **123A. Engineering Design Project I. \***

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. Students are billed a materials fee. Prerequisite(s): Computer Engineering 121; previous or concurrent enrollment in Computer Engineering 185; permission of department and instructor. (General Education Code(s): PR-E.) The Staff

### **123B. Engineering Design Project II (7 credits). \***

Second of two-course sequence in engineering system design. Students fully implement and test system designed and specified in course 123A. Formal written report, oral presentation, and demonstration of successful project to review panel of engineering faculty required. Students are billed a materials fee. Prerequisite(s): courses 123A and 185. Enrollment limited to 35. The Staff

### **125. Logic Design with Verilog. W**

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. Prerequisite(s): courses 100 and 100L. Concurrent enrollment in course 125L required. Enrollment limited to 40. M. Guthaus

### **125L. Logic Design with Verilog Laboratory (2 credits). W**

Laboratory sequence illustrating topics covered in course 125. Two 2-hour laboratory sessions per week. Students are billed a materials fee. Prerequisite(s): courses 100 and 100L. Concurrent

enrollment in course 125 is required. Enrollment limited to 40. M. Guthaus

### **129A. Capstone Project I (2 credits). F**

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. Prerequisite(s): previous or concurrent enrollment in courses 121 and 121L. P. Mantey

### **129B. Capstone Project II. W**

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. Students are billed a materials fee. Prerequisite(s): courses 121, 121L, and 129A. Previous or concurrent enrollment in course 185. Enrollment by permission of instructor. (General Education Code(s): PR-E.) P. Mantey, D. Munday

### **129C. Capstone Project III. S**

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. Students are billed a materials fee. Prerequisite(s): courses 129B and 185. Enrollment by permission of

## Computer Engineering

instructor. P. Mantey, D. Munday

### **131. Human-Computer Interaction. \***

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 Computer Engineering 231 or Digital Arts and New Media 231. Prerequisite(s): Computer Science 12B. The Staff

### **141. Feedback Control Systems. F**

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. (Also offered as Electrical Engineering 154. Students cannot receive credit for both courses.) Prerequisite(s): Electrical Engineering 103. Enrollment restricted to School of Engineering and Division of Physical and Biological Sciences majors, or by permission of instructor. Enrollment limited to 30. R. Sanfelice, The Staff

### **145. Estimation and Introduction to Control of Stochastic Processes. S**

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 Applied Mathematics and Statistics 118.) (General Education Code(s): SR.) D. Milutinovic

### **149. Introduction to Cyber-physical Systems. W**

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 (course 8 is recommended), differential equations, linear algebra, and basic calculus. Knowledge of MATLAB/Simulink is useful. Students cannot receive credit for this course and course 249. (Formerly course 142.) Prerequisite(s): courses 100/L or equivalent, and courses 13/L or equivalent. R. Sanfelice

### **150. Introduction to Computer Networks. F,W**

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 course 80N can take this course for credit. Prerequisite(s): course 16 and either courses 12 and 12L, or Computer Science 12B and 12M. Concurrent enrollment in course 150L is required. K. Obraczka

### **150L. Introduction to Computer Networks Laboratory (2 credits). F,W**

Illustrates the concepts covered in course 150 and provides students with hands-on experience in computer networks. Students are billed a materials fee. Prerequisite(s): course 16 and either courses 12 and 12L, or Computer Science 12B and 12M. Concurrent enrollment in course 150 is required. K. Obraczka

### **151. Advanced Computer Networks. S**

Provides an in-depth coverage of fundamental topics introduced in course 150 including routing, transport, and internetworking. Also introduces advanced concepts not covered in course 150 including wireless, application-layer services, security, etc. (Formerly Network Administration.) Prerequisite(s): course 150. Concurrent enrollment in course 151L is required. Enrollment limited to 60. B. Smith

### **151L. Advanced Computer Networks Laboratory (2 credits). S**

Laboratory illustrating the concepts covered in course 151: provides students with hands-on experience in computer networks. Students are billed a materials fee. Prerequisite(s): course 150/L. Concurrent enrollment in course 151 is required. Enrollment limited

to 30. B. Smith

**153. Digital Signal Processing. S**

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. (Also offered as Electrical Engineering 153. Students cannot receive credit for both courses.) Prerequisite(s): Electrical Engineering 103. A. Fletcher

**156. Network Programming. W**

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. Prerequisites: course 150/L and Computer Science 101. Concurrent enrollment in course 156L required. The Staff

**156L. Network Programming Laboratory (2 credits). W**

Laboratory sequence illustrating concepts taught in course 156. Students learn use of network programming tools and methods via programming exercises. Students are billed a materials fee. Prerequisites: course 150/L and Computer Science 101. Concurrent enrollment in course 156 required. The Staff

**158. Network Management and Operations. \***

Computer networking internship in the Network Management and Operations (NMO) Lab, an industry-sponsored, networks-research center at UCSC. Working in teams under faculty mentorship, students solve problems posed by industry sponsors over the course of a quarter. Students learn technical topics relevant to the problem, and gain experience and training in best practices for collaborative, multi-site problem solving. Prerequisite(s): course 150/L and 151/L; and previous or concurrent enrollment in course 185. Enrollment by instructor permission. The Staff

**161. Mobile Sensing and Interaction. W**

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(s): courses 13/L or Computer Science 12B/M; and Physics 5A or Physics 6A. R. Manduchi

**167. Sensing and Sensor Technologies. W**

Introduces the fundamental issues in sensing and various sensor technologies including motion sensors, velocity sensors, GPS sensors, acoustic sensors, light and image sensors, and range sensors. Also demonstrates sensor technologies using a system approach to show how they can be integrated into a complete digital system. Prerequisite(s): Electrical Engineering 103. Concurrent enrollment in course 167L is required. S. Petersen

**167L. Sensing and Sensor Technologies Lab (2 credits). W**

Lab assignments reinforce the concepts and techniques learned in course 167. Assignments include measurement and estimation techniques, experiments with various sensors, and a course project in which students build digital sensing systems. Students are billed a materials fee. Prerequisite(s): Electrical Engineering 103. Concurrent enrollment in course 167 is required. S. Petersen

**177. Applied Graph Theory and Algorithms. \***

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. Prerequisite(s): Computer Science 101. The Staff

**185. Technical Writing for Computer Engineers. F,W,S**

Writing by engineers and computer scientists, not to general audiences, but to engineers, engineering managers, and technical writers. Exercises include job application and resume, in-code documentation, algorithm description, naive-user documentation, library puzzle, survey article, proposal, progress report, formal technical report, and oral presentation. Offered in alternate quarters. Enrollment restricted to majors in Computer Engineering, Electrical Engineering, Bioengineering, Bioinformatics, Robotics Engineering, or Network and Digital Technology, or by permission of instructor. Prerequisite(s): satisfaction of Entry Level Writing and

## Computer Engineering

Composition requirements; and Computer Science 12B or Computer Engineering 12 or Biomolecular Engineering 160. Enrollment limited to 60. (General Education Code(s): W.) G. Moulds

### **193. Field Study. F,W,S**

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. The Staff

### **193F. Field Study (2 credits). F,W,S**

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. The Staff

### **194. Group Tutorial. F,W,S**

A program of independent study arranged between a group of students and a faculty member. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **194F. Group Tutorial (2 credits). F,W,S**

A program of independent study arranged between a group of students and a faculty member.

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **195. Senior Thesis Research. F,W,S**

Students submit petition to sponsoring agency. Prerequisite: course 123A. The Staff

### **195F. Senior Thesis Research (2 credits). F,W,S**

Students submit petition to sponsoring agency. Consent of instructor required. Prerequisite: course 123A. The Staff

### **198. Individual Study or Research. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **198F. Individual Study or Research (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

For fourth-year students majoring in computer engineering. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

For fourth-year students majoring in computer engineering. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## GRADUATE COURSES

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### **200. Research and Teaching in Computer Science and Engineering (3 credits). F**

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. 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 T.A.s. Enrollment restricted to graduate students. K. Obraczka

### **202. Computer Architecture. W,S**

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. Prerequisite(s): course 110 or 112. Enrollment restricted to graduate students; undergraduates may enroll if they have completed course 110 or 112 and with consent of instructor. Enrollment limited to 30. J. Renau Ardevol, J. Zhao

### **215. Models of Robotic Manipulation. W**

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,

## Computer Engineering

including Newton-Euler and Lagrangian formulations. Enrollment restricted to graduate students; and to seniors who have taken electrical engineering 154, and applied mathematics and statistics 10 or 10A or mathematics 21; or by permission of instructor. M. Teodorescu

**216. Bio-Inspired Locomotion. S**  
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. Prerequisite(s): course 9 or equivalent. Enrollment restricted to graduate students, and seniors by permission of instructor. Enrollment limited to 20. M. Teodorescu, The Staff

**218. Mechatronics. F**  
Introduction to intelligent electro-mechanical systems, combining aspects of computer, electrical, mechanical, and software engineering. Students become proficient in all aspects of mechanical, electrical, computer system design, analysis, prototyping, presentation and team mentorship. Cannot receive credit for this course and course 118. Prerequisite(s): concurrent enrollment in course 218L. Enrollment restricted to graduate students. Enrollment limited to 36. G. Elkaim

**218L. Mechatronics Lab (2 credits). F**  
Laboratory sequence illustrating topics covered in course 218. Two 2-hour laboratory sessions per week. Students cannot receive credit for this course and course 118L. Students are billed a materials fee. Prerequisite(s):

concurrent enrollment in course 218. Enrollment restricted to graduate students. Enrollment limited to 36. G. Elkaim

**220. Advanced Parallel Processing. \***  
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 Parallel Processing.) Enrollment restricted to graduate students; undergraduates may enroll with permission of instructor. The Staff

**221. Advanced Microprocessor Design. F**  
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. Prerequisite(s): course 202; and course 125, 225, or equivalent Verilog experience. Concurrent enrollment in course 221L required. Enrollment restricted to graduate students. Enrollment limited to 20. J. Renau Ardevol

**221L. Advanced Microprocessor Design Laboratory (3 credits). F**  
Laboratory sequence illustrating topics covered in course 221. Prerequisite(s): course 202; and course 125, 225, or equivalent

Verilog experience. Concurrent enrollment in course 221 required. Enrollment restricted to graduate students. Enrollment limited to 20. J. Renau Ardevol

**222. VLSI Digital System Design. S**  
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 course 122. (Formerly VLSI Digital System Design.) Prerequisite(s): course 122 or equivalent. Enrollment limited to 15. M. Guthaus

**223. VLSI System-on-a-Chip Design. \***  
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. Prerequisite(s): course 222 or permission of instructor. Enrollment restricted to graduate students. The Staff

**224. Testing Digital Circuits. \***  
An introduction to the theory and practice of testing. Topics are chosen from fault and defect models, test generation for combinational and sequential circuits, fault simulation, scan-design and built-in self-test. Enrollment restricted to graduate students; undergraduates may

## Computer Engineering

enroll if they have completed Computer Science 101. The Staff

### **225. Introduction to ASIC Systems Design. \***

Introduces reconfigurable computing systems with emphasis on field-programmable devices. Topics include: architectures of field-programmable devices; novel reconfigurable systems; and hardware algorithms. Students are billed a materials fee. Enrollment restricted to computer engineering graduate students. Enrollment limited to 10. Offered in alternate academic years. The Staff

### **229. Field-Programmable Gate Arrays Computer-Assisted Design. \***

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. Enrollment restricted to graduate students or by consent of instructor. Courses 100, 125, 126, 222, 225, or other digital design experience recommended. Enrollment limited to 20. The Staff

### **230. Computer Performance Evaluation. \***

Introduction to methods of analysis of computer system performance. Predictive performance models with emphasis on queuing models; exact and appropriate solution methods, discrete-event simulation, and numeric iterative approaches; analytical solutions and their computation; separable queuing networks, decomposition approaches; examples of practical application; and performance measurement, model validation,

robustness of models, and operational analysis. Enrollment restricted to graduate students. Enrollment limited to 20. Offered in alternate academic years. The Staff

### **231. Human-Computer Interaction. \***

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 course 131. (Also offered as Digital Arts and New Media 231. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. The Staff

### **232. Arithmetic Processors. \***

Concept of number systems: binary additions, multiplications, divisions; elementary function evaluations; algorithm acceleration; floating-point and significant arithmetics; IEEE standards; technology related issues; algorithm evaluation by implementation with gate arrays. Prerequisite(s): course 202. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

### **233. Human Factors. \***

Course focuses on theories, practices, and design of systems to optimize human well-being and system performance through consideration of psychological, social, physical, and biological factors. Covers human sensory systems and memory, workload management, error and reliability, performance measurement, and

ergonomic design. Interdisciplinary course for social science and engineering graduate students. Enrollment restricted to graduate students; undergraduates may enroll if they have completed course 131. The Staff

### **240. Introduction to Linear Dynamical Systems. W**

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. Enrollment restricted to graduate students; undergraduates may enroll if they have completed Electrical Engineering 103 and Applied Math and Statistics 147. G. Elkaim

### **241. Introduction to Feedback Control Systems. F**

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

## Computer Engineering

design. Course has concurrent lectures with Electrical Engineering 154. (Also offered as Electrical Engineering 241. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. R. Sanfelice, The Staff

### **242. Applied Feedback Control. W**

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. Prerequisite(s): Electrical Engineering 154 or course 241. Enrollment restricted to juniors, seniors, and graduate students. G. Elkaim

### **243. System Identification. \***

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. Prerequisite(s): course 240, or by permission of instructor. The Staff

### **244. Digital Control. \***

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. Prerequisite(s): course 141 or 241. Enrollment restricted to graduate students, or by permission of the instructor. The Staff

### **245. Estimation and Introduction to Control of Stochastic Processes. S**

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 Applied Mathematics and Statistics 218.) Enrollment restricted to graduate students. D. Milutinovic

### **246. Hybrid Dynamical Systems. S**

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. Prerequisite(s): course 241. Enrollment restricted to graduate students. R. Sanfelice

### **247. Advanced Feedback Control Design.**

Advanced methods for the design of control algorithms for systems with nonlinearities, input constraints, network actuators/sensors, and intermittent availability of information. Modeling of nonlinear systems, Lyapunov stability, feedback redesign, nonlinear

damping, control-Lyapunov functions, gain scheduling, passivity, network control, self- and event-triggered control, hybrid feedback control. Students validate analytical results using tools for numerical simulation of control systems. Prerequisite(s): courses 241 and 242. Enrollment is restricted to graduate students. R. Sanfelice

### **248. Games in Design and Control. \***

Graduate-level introduction to game theory and its applications to system design, verification, analysis, and optimal control. Enrollment restricted to graduate students. Computer Science 101, 201, or equivalent recommended. The Staff

### **249. Introduction to Cyber-physical Systems. W**

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 (course 8 is recommended), differential equations, linear algebra, and basic calculus. Knowledge of MATLAB/Simulink is useful. Students cannot receive credit for this course and course 149. Prerequisite(s): courses 100/L or equivalent, and courses 13/L or equivalent. R. Sanfelice

**250. Multimedia Systems. \***

Study of state-of-the-art technology for networked multimedia systems. Topics include audio, image, and video acquisition and compression standards (JPEG, MPEG, and ITU families); networking for multimedia; and digital television. Proficiency in C or C++ required. Prerequisite(s): Enrollment restricted to graduate students. The Staff

**251. Error-Control Coding. \***

Overview of coding to protect messages against error during transmission or storage. Topics include channel models, linear algebra over finite fields, linear block codes and bounds, cyclic codes (BCH and RS), decoding algorithms, spectral analysis, codes on graphs, and low-complexity algorithms. Enrollment restricted to graduate students or consent of instructor. The Staff

**252A. Computer Networks. F**

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. Enrollment restricted to graduate students. A. Varma

**252B. Principles of Computer Communication. \***

Theory and practice of computer communication networks. Emphasis is on verification and performance analysis of network control processes. Topics include protocols for channel access, point-

to-point and multipoint reliable transmission, routing, congestion control, network management, multicasting, and ATM networks. (Formerly Modeling of Communications Protocols.) Prerequisite(s): courses 107 and 252A. J. Garcia-Luna-Aceves

**253. Network Security. \***

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. Prerequisite(s): course 252A and Computer Science 201. Enrollment restricted to graduate students. The Staff

**254. High Speed Computer Networks. \***

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. Prerequisite(s): course 252B. The Staff

**256. Design Project in Computer Networks. \***

Students develop a working implementation of a network protocol with the goal of obtaining hands-on experience in implementing real-world network protocols. Prerequisite(s): course 252A; enrollment restricted to graduate students. The Staff

**257. Wireless and Mobile Networks. S**

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. Prerequisite(s): course 252A or permission of instructor. Enrollment limited to 20. K. Obraczka

**258. Unix Networking Internals. \***

In-depth treatment of the implementation of network protocols in typical open-source Unix systems. Topics include implementation of send and receive functions, buffer management, interrupt handling, locking, scheduling and timer management. Major implementation project required. Prerequisite(s): course 252A. Computer Science 111 recommended. Enrollment restricted to graduate students. The Staff

**259. Sensor Networks. \***

Focus is 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.). Explore how physical layer and hardware issues may influence protocol design. Courses 252A and 257 recommended. The Staff

**263. Data Compression. \***

Introduction to information theory and data compression. Lossless coding (Huffman, arithmetic, dictionary codes). Lossy coding (scalar and vector quantization, differential coding, transform coding). Applications to the compression of real data sets (DNA sequences, biological time series, multimedia streams). Concurrent lectures with course 108. Students cannot receive credit for both this course and course 108. Students

## Computer Engineering

must have basic knowledge of probability theory. Enrollment restricted to graduate students. The Staff

### **264. Image Analysis and Computer Vision. W**

Brief review of image processing. Binary images, thresholding, morphological operations; edge detection and segmentation; contours: digital curves and curve fitting; statistical texture analysis, shape from texture; depth cues, stereo matching, depth from stereo; color perception and segmentation; and shading and image radiance, surface orientation, and shape from shading. Electrical Engineering 264 encouraged, but not required. Undergraduate students who are interested in enrolling should meet with the instructor first. R. Manduchi

### **277. Graph Algorithms. S**

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. Prerequisite(s): Computer Science 101 and 102; or course 177; or Computer Science 201; or equivalent. Enrollment restricted to graduate students. Enrollment limited to 20. M. Schlag

### **280C. Seminar on Control (2 credits). F,W,S**

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. Enrollment restricted to graduate students; undergraduates may enroll with permission of instructor. May be repeated for credit. R. Sanfelice, D. Milutinovic, G. Elkaim

### **280G. VLSI/CAD Seminar (2 credits). F,W,S**

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. Enrollment limited to 20. May be repeated for credit. M. Guthaus

### **280N. Seminar on Networks (2 credits). \***

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 restricted to graduate students. May be repeated for credit. K. Obraczka, J. Garcia-Luna-Aceves

### **280P. Seminar on Parallel Processing (2 credits). \***

Weekly seminar series covering topics of current research in parallel systems, architectures, and algorithms. Current research work and literature in these areas are discussed. Enrollment restricted to graduate students. Enrollment limited to 20. May be repeated for credit. The Staff

### **280T. Seminar on New Technologies (2 credits). \***

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. The Staff

### **280V. Seminar on Computer Vision (2 credits). F,W,S**

Weekly graduate-level seminar series discussing advanced topics in computer vision and image analysis. Current research and literature presented during each meeting. Enrollment limited to 20. May be repeated for credit. R. Manduchi

### **285. Technical Writing for Engineering Graduates. \***

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 restricted to graduate biomolecular engineering, computer engineering, computer science, and electrical engineering majors. (Open to all School of Engineering graduate students.) Enrollment limited to 20. The Staff

### **290L. Advanced Topics in VLSI Computer-Aided Design. \***

A graduate course on a research topic in VLSI computer-aided design. Topic varies according to instructor. Possible topics include, but are not limited to specification languages and formal verification, logic minimization, testing and verification, electrical simulation, layout synthesis, and behavioral synthesis. Course 100, 125, 126, 222, or 225 recommended. The Staff

### **290M. Topics in Parallel Computation. \***

Investigates selected topics in applied parallel computation. Topics may include numerical methods, artificial intelligence and machine learning algorithms, graphics and image processing,

## Computer Engineering

systolic algorithms, and the interplay between hardware and algorithms. Students are encouraged to investigate and discuss the parallelization of their own research. Enrollment restricted to graduate students. The Staff

### **290N. Topics in Computer Performance. \***

Selected topics of current interest in the area of computer system performance. Subjects may include aspects of large systems, performability, computer networks, storage subsystems, and nontraditional approaches and are subject to periodic revision. Enrollment restricted to graduate students. The Staff

### **290V. Advanced Topics in Visual Computing. \***

Advanced course in image analysis and computer vision. Topics include motion analysis, multiple view geometry, 3D reconstruction, image-based rendering, vision-

based graphics, face detection and recognition, tracking, image and video retrieval, and human-computer interface. Enrollment restricted to seniors and graduate students. Enrollment limited to 20. The Staff

### **293. Advanced Topics in Computer Engineering. \***

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. The Staff

### **296. Masters Project (2 credits). F,W,S**

Independent completion of a masters project under faculty supervision. Students submit petition to sponsoring agency. Enrollment restricted to graduate

students. May be repeated for credit. The Staff

### **297. Independent Study or Research. F,W,S**

Independent study or research under faculty supervision. Students submit petition to sponsoring agency. The Staff

### **299. Thesis Research. F,W,S**

Thesis research conducted under faculty supervision. Students submit petition to sponsoring agency. The Staff

### **299F. Thesis Research (2 credits). F,W,S**

Independent study or research under faculty supervision. Enrollment restricted to graduate students. Recommended for part-time students. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

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## COMPUTER SCIENCE

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2015-16 General Catalog

Baskin School of Engineering

(831) 459-2158

<http://www.soe.ucsc.edu>

[Faculty](#) | [Course Descriptions](#)

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### PROGRAM DESCRIPTION

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Computer science is the study of the theoretical and practical aspects of computer technology and computer usage. The Computer Science (CMPS) Department offers courses on a wide range of topics, many of which include a mathematical component, and offers undergraduate bachelor of arts and bachelor of science degrees in computer science, as well as the master of science and doctor of philosophy degrees. Besides offering instructional courses, the department engages in a substantial research program in which both advanced undergraduates and graduate students participate.

The bachelor of arts (B.A.) program at UCSC 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, or even for a double major in another discipline. The bachelor of science (B.S.) program is appropriate for students desiring a somewhat stronger concentration in the sciences, with more courses in computer science and computer engineering, as well as courses in physics or chemistry; this program also allows for electives outside of science and engineering.

Because many courses in both programs have prerequisites, students leaning toward any of these programs will enjoy greater scheduling flexibility if they begin some preparatory courses in their first year. The specific course requirements for each undergraduate degree are given below.

Applications of computer science are found in many other areas of study, from art and music to business and science. Thus, interdisciplinary activities are encouraged. For those students whose primary interest is in another area, a minor in computer science is offered.

These include CMPS 10, Introduction to Computer Science; CMPS 17, Social Networks; CMPS 80J, Technology Targeted at Social Issues; and CMPS 80S, From Software Innovation to Social Entrepreneurship. CMPS 10, Introduction to Computer Science, may be beneficial to students who are considering the major but have a limited background in computer science. There are also introductory programming classes intended for nonmajors: CMPS 5C, 5J, 5P, Introduction to Programming (in the C, Java, and Python languages).

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### COMPUTER SCIENCE POLICIES

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#### DECLARATION OF THE COMPUTER SCIENCE MAJORS

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Admission to the computer science majors is selective. First-year applications may receive direct admission at the time they apply to UCSC based on their high school record and test scores. Admission to the major after a student has entered UCSC is based on the grades received in all foundation courses (see below) attempted at UCSC and will be considered no sooner than the student's second quarter. A cumulative GPA of at least 2.80 in these courses is required for declaration of computer science majors (Computer Science B.S. and Computer Science B.A.). At most one unsuccessful attempt (grade C-, D+, D, F, or NP) for a foundation course is permitted. In addition to this GPA requirement, after the first three quarters, students must have completed the foundation courses (listed below) and be able to complete the major within campus limits in order to be eligible to declare a computer science major. Denials of admission to the major may be appealed by submitting a letter to the School of Engineering Undergraduate Office, addressed to the Computer Science Undergraduate Director, describing why the prior performance is not an accurate reflection of the student's potential. 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

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### COURSES FOR NONMAJORS

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The Computer Science Department offers a wide range of courses intended for nonmajors as well as majors.

## Computer Science

student, college, and Office of the Registrar of the decision.

### FOUNDATION COURSES

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The foundation courses for all computer science majors are as follows:

CMPS 12A/L (or Computer Engineering 13, or both CMPS 5J and CMPS 11) and 12B/M; Computer Engineering 16; and Mathematics 19A and 19B, or 20A and 20B, or 11A and 11B. CMPS 13H/L may be used instead of both CMPS 12A/L and 12B/M.

UCSC students that have completed three or more quarters at UCSC must complete the foundation courses before they can declare a computer science major.

### HONORS IN THE MAJORS

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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.

### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. Refer to major program statements for details.

### LETTER GRADE POLICY

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Please refer to the School of Engineering section of the catalog (subheading: *Letter Grade Policy*).

### TRANSFER STUDENTS

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Most courses in the computer science program at UCSC 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, students are first introduced to programming using the programming language Java. The core programming sequence, courses 12A/L and 12B/M (or 13H/L, which covers both 12A/L and 12B/M), exposes students to both Java and C. Many upper-division courses that involve programming use the C and C++ programming languages. Transfer students who are not familiar with both Java and C may need to take a remedial course. Students familiar with C++ and Unix

should find the transition to Java and C relatively simple.

Transfer students must have completed all of the foundation courses listed above, or their articulated equivalents. A student lacking one foundation course may be admitted if they have completed at least one of CMPE 12/L or Physics 5A/L. It is highly recommended that all transfer students in computer science complete these two courses prior to admission.

Additional information on SOE policies can be found on the web at: <http://ua.soe.ucsc.edu/policies-forms/>.

### SCHOOL OF ENGINEERING POLICIES

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Please refer to the School of Engineering section of the catalog (subheading: *Admission to School of Engineering Majors*) for additional policies that apply to all School of Engineering programs. These policies include admission to the major and the need for computer science students to obtain preapproval before taking courses elsewhere.

### PREPARATION FOR THE MAJOR

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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 FOR B.S. OR B.A. DEGREE

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Recipients of a Bachelor of Science or Bachelor of Arts degree in Computer Science at UCSC 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 and compilers
  - Software engineering and development
  - Computer hardware and architecture
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.

## Computer Science

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.

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## B.A. MAJOR REQUIREMENTS

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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 15 courses, 7 lower-division and 8 upper-division. Out of these, the 7 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 7 additional upper-division elective courses.

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### LOWER-DIVISION REQUIREMENTS

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Each student must successfully complete the following seven required preparatory courses:

#### **Computer Science**

CMPS 12A/L, Introduction to Programming(Accelerated)/Laboratory (or CMPS 5), Introduction to Programming in Java and CMPS 11, Intermediate Programming. Computer Engineering 13 may be taken as an alternative to CMPS 12A/L. CMPS 13H/L may be taken as an alternative to CMPS 12A/L and CMPS 12B/M)

CMPS 12B/M, Introduction to Data Structures/Laboratory (CMPS 13H/L may be taken as an alternative to CMPS 12A/L and CMPS 12B/M)

#### **Computer Engineering**

Computer Engineering 12/L, Computer Systems and Assembly Language/Laboratory

Computer Engineering 16, Applied Discrete Mathematics

#### **Mathematics**

Mathematics 19A and 19B, Calculus for Science, Engineering, and Mathematics (credit for one or both may be granted with adequate performance on the College Entrance Examination Board (CEEB) calculus AB or BC Advanced Placement examination), or Mathematics 11A and 11B (Calculus with Applications), or Mathematics 20A and 20B, Honors Calculus

## **Applied Mathematics and Statistics**

Applied Mathematics and Statistics 10, Mathematical Methods for Engineers I or Mathematics 21, Linear Algebra

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### UPPER-DIVISION REQUIREMENTS

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All students in the major must complete the following course:

CMPS 101, Algorithms and Abstract Data Types

In addition to the above course (and the lower-division requirements, listed above), students must complete upper-division electives chosen as follows:

- complete three courses from the breadth list below;
- complete two additional computer science electives chosen from any 5-credit upper-division computer science course except those numbered 191-194 and 196-199;
- complete two additional 5-credit technical electives selected from the technical elective list below.

Complete the Disciplinary Communication requirement given below. At least 50 percent of these upper-division courses must be completed at UCSC.

#### **Breadth List (complete at least three)**

CMPS 102, Introduction to Analysis of Algorithms

CMPS 104A, Compiler Design

CMPS 111, Operating Systems

CMPS 112, Comparative Programming Languages

CMPS 115, Software Methodology

CMPS 122, Computer Security

CMPS 140, Artificial Intelligence

CMPS 160/L, Computer Graphics / Laboratory

CMPS 180/CMPS 180W, Database Systems I

Computer Engineering 110, Computer Architecture

#### **Technical Elective List (complete at least two)**

Any 5-credit upper-division course offered by the Baskin School of Engineering except those numbered 191 through 194 and 196 through 199.

Any 5-credit upper-division course from the Division of Physical and Biological Sciences except those numbered 190 and above.

Art 118, Computer Art: Theories, Methods, and Practices

Art 120/121, Advanced Projects in Computer Art I/II

Economics 100M, Intermediate Microeconomics, Math Intensive

Economics 100N, Intermediate Macroeconomics, Math Intensive

## Computer Science

Economics 101, Managerial Economics  
Environmental Studies 115A/L, Geographic Information Systems  
Film and Digital Media 170A, Fundamentals of Introduction to Digital Media Production  
Film and Digital Media 177, Digital Media Workshop: Computer as Medium  
Linguistics 112/113/114, Syntax I/II/III  
Linguistics 116/118, Semantics II/III  
Linguistics 125, Foundations of Linguistic Theory  
Music 123, Electronic Sound Synthesis  
Music 124, Intermediate Electronic Sound Synthesis  
Music 125, Advanced Electronic Sound Synthesis  
**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.A.) is satisfied by completing CMPS 115, CMPS 195, Computer Engineering 185, CMPS 132 and 132W, CMPS 185, or CMPS 180 and 180W. Some of these courses may also fulfill one of the upper-division electives listed above.

## B.S. MAJOR REQUIREMENTS

This program is designed for students who wish to maximize exposure to computer science concepts and methods by taking a larger selection of upper-division computer science courses, as well as additional courses in the sciences and mathematics. A minimum of 21 courses must be completed for the B.S. in computer science, whereas a minimum of 15 courses must be completed for the B.A. in computer science. Out of the 21 courses, 10 are lower-division courses (including two science courses), and 11 are upper-division courses. The B.S. is more structured than the B.A.; 17 specific courses are required, and the remaining four are elective upper-division computer science or computer engineering courses.

### LOWER- AND UPPER-DIVISION REQUIREMENTS

Students are required to take the following 18 courses:

#### **Computer Science**

CMPS12A/L Introduction to Programming (Accelerated)/Laboratory (or CMPS5J, Introduction to Programming in Java and CMPS11, Intermediate Programming. Computer Engineering 13/L may be taken as an alternative to CMPS 12A/L. CMPS 13H/L may be taken as an alternative to CMPS 12A/L and CMPS 12B/M)

CMPS 12B/M Introduction to Data Structures/Laboratory (CMPS 13H/L may be taken as an alternative to CMPS 12A/L and CMPS 12B/M)  
CMPS 101 Algorithms and Abstract Data Types  
CMPS 102 Introduction to Analysis of Algorithms  
CMPS 104A Fundamentals of Compiler Design I  
CMPS 111 Introduction to Operating Systems  
CMPS 112 Comparative Programming Languages  
CMPS 130 Computational Models

#### **Computer Engineering**

Computer Engineering 12/L Computer Systems and Assembly Language/Laboratory  
Computer Engineering 16 Applied Discrete Mathematics  
Computer Engineering 110 Computer Architecture, or Computer Engineering 112, Computer and Game Console Architecture

#### **Mathematics**

Mathematics 19A and 19B, Calculus for Science, Engineering, and Mathematics, or Mathematics 20A and 20B, Honors Calculus  
Mathematics 23A, Multivariable Calculus

#### **Applied Mathematics and Statistics**

Applied Mathematics and Statistics 10, Mathematical Methods for Engineers I; or Mathematics 21, Linear Algebra

Applied Mathematics and Statistics 131, Introduction to Probability Theory, or Computer Engineering 107, Probability and Statistics for Engineers

#### **Physics or Chemistry**

Either two physics or two chemistry courses, with their associated laboratories, from the following:

Physics 5A/L, Introduction to Physics I/Laboratory (or 6A/L); and either

Physics 5B/M, Introduction to Physics II/Laboratory (or 6B/M); or

Physics 5C/N, Introduction to Physics III/Laboratory (or 6C/N)

Chemistry 1A and 1B/M, General Chemistry/Laboratory; or

Chemistry 1A and 1C/N, General Chemistry/Laboratory.

#### **Additional Upper-Division Electives**

Four upper-division computer science or computer engineering courses with course number 190 or below, or CMPS 195. One of these courses may be replaced by one of the following upper-division mathematics courses:

## Computer Science

Applied Mathematics and Statistics 114, Introduction to Dynamical Systems;

Applied Mathematics and Statistics 131, Introduction to Probability Theory;

Applied Mathematics and Statistics 147, Computational Methods and Applications;

Mathematics 115, Graph Theory;

Mathematics 117, Advanced Linear Algebra;

Mathematics 126, Mathematical Control Theory;

Mathematics 148, Numerical Analysis.

### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

The DC Requirement in computer science (B.S.) is satisfied by completing CMPS 115, CMPS 195, Computer Engineering 185, CMPS 132 and 132W, CMPS 185, or CMPS 180 and 180W. These courses may also fulfill one of the upper-division electives listed above.

### COMPREHENSIVE REQUIREMENT FOR THE COMPUTER SCIENCE B.A. AND B.S.

In addition to the above B.A. or B.S. 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.

#### CAPSTONE COURSES

Students may choose from one of the following capstone courses to satisfy their exit requirement:

CMPS 104B Fundamentals of Compiler Design II

CMPS 117 Software Design Project II

CMPS 161/L Introduction to Data Visualization and Laboratory

CMPS 165 Data Programming for Visualization

CMPS 181 Database Systems II

CMPS 183 Web Applications

Students taking one of the capstone courses will enroll normally. Students need to pass the capstone course to pass the exit requirement. No course may be attempted more than twice without prior approval from the chair of the department offering the course. Withdrawals count as an attempted class for this purpose.

#### 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 CMPS 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 CMPS 195 is earned when the final thesis is approved.

### COMPUTER SCIENCE MAJOR PLANNERS

The following are four sample academic plans for first-year students as preparation for the computer science major. Plans One A and Two A are suggested guidelines for students who have some prior experience with programming. Plans One B and Two B are for students who are considering the major and have no prior programming experience. Students who plan carefully can still have several openings free to take other breadth courses they find interesting.

Plan One A, B.A. Degree			
Year	Fall	Winter	Spring
1st (frsh)	CMPS 10	MATH 19B	CMPS 12B/M
	MATH 19A	CMPS 12A/L	AMS 10
2nd (soph)	CMPE 12/L	CMPE 16	CMPS 101

Plan One B, B.A. Degree			
Year	Fall	Winter	Spring
1st (frsh)	AMS 3	MATH 19A	MATH 19B
	CMPS 10	CMPS 5J	CMPS 11
2nd (soph)	CMPS 12B/M	CMPE 16	CMPS 101
	AMS 10	CMPE 12/L	

## Computer Science

<b>Plan Two A, B.S. Degree</b>			
Year	Fall	Winter	Spring
1st (frsh)	CMPS 12A/L	CMPS 12B/M	CMPE 16
	MATH 19A	MATH 19B	MATH 23A
2nd (soph)	CMPS 101	CMPE 12/L	CMPS 102
	AMS 10	PHYS 6A/L	PHYS 6C/N

<b>Plan Two B, B.S. Degree</b>			
Year	Fall	Winter	Spring
1st (frsh)	CMPS 10	CMPS 5J	CMPS 11
	MATH 3	MATH 19A	MATH 19B
2nd (soph)	CMPS 12B/M	MATH 23A	CMPS 101
	AMS 10	PHYS 6A/L	PHYS 6C/N

## MINOR REQUIREMENTS

Twelve courses are required for the computer science minor. These courses are:

- Mathematics 11A and 11B or 19A and 19B or 20A and 20B;
- Applied Mathematics and Statistics 10 or Mathematics 21;
- CMPS 12A/L (or Computer Engineering 13/L, or both CMPS 5J and CMPS 11);
- CMPS 12B/M;
- Computer Engineering 16;
- CMPS 101;
- four additional upper-division computer science courses from a list of approved electives (see the department's curriculum chart for the computer science minor at <http://ua.soe.ucsc.edu/curriculum-charts/>).

Upper-division computer engineering and mathematics courses that generally apply toward the computer science major may not be applied toward the computer science minor. In addition, some upper-division computer science courses may not be applied toward the computer science minor. There is no comprehensive examination or senior thesis requirement for the minor.

## GRADUATE PROGRAMS

### PROGRAM DESCRIPTION

The Computer Science Department at UCSC offers both a master's program and a doctoral program in computer science, as well as a master's in games and playable media.

The goal of the computer science programs 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 doctor of philosophy degree (Ph.D.). The student-faculty ratio is five to one, making it possible for students to receive individual attention and to pursue programs that fit their individual needs. The intellectual atmosphere is enriched by regular colloquia and seminars presented by eminent contributors to the field, many of whom are associated with other major universities and industrial research centers in Silicon Valley and the wider San Francisco Bay Area.

The goal of the M.S. in games and playable media is to prepare 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, making possible deep connection and collaboration with local industry and economic development groups. The curriculum includes deep engagement with game creation as well as a focus on professional development. Students can also take advantage of the strong course offerings in games and related technologies on the Santa Cruz campus, as well as make connections with the department's field-leading research groups. The M.S. in games and playable media is a four-quarter program that begins in fall quarter and ends in the following summer. Students are expected to complete coursework in one academic year, without leaves of absence.

The Computer Science Department enjoys a close relationship with the Computer Engineering and Electrical Engineering Departments, the Biomolecular Engineering Department, the Applied Mathematics and Statistics Department, Technology Management Department, and the new Computational Media Department.

Most computer science Ph.D. students are hired as teaching assistants helping with undergraduate courses, hired as research assistants working for computer science and other School of Engineering faculty, or awarded fellowships to pursue their research.

Additional information on the computer science graduate programs can be found on the department's web pages at [www.soe.ucsc.edu](http://www.soe.ucsc.edu).

## Computer Science

### REQUIREMENTS FOR THE COMPUTER SCIENCE MASTER'S DEGREE: PROJECT TRACK

#### Course Requirements

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Each student is required to take 40 credits as follows:

- Computer Science 200, Research and Teaching in Computer Science and Engineering, 3 credits
- Computer Science 201, Analysis of Algorithms, 5 credits
- Computer Science 203, Programming Languages, 5 credits
- Computer Science 296, Master's Project, 2 credits
- a base requirement in computer architecture must be met by taking Computer Engineering 110 (grade B or higher) or Computer Engineering 202. Computer Engineering 110 can be taken to meet the architecture requirement, however, the credits will not be counted toward graduation requirements
- one course each from three different breadth categories for a total of three courses (15 credits)—see [www.cs.ucsc.edu/graduates/breadth/](http://www.cs.ucsc.edu/graduates/breadth/)
- all remaining courses must be regular, 5-credit graduate courses from computer science; courses that do not count include all courses numbered 200, 280, 296, 297, and 299
- at least 25 credits must be in computer science
- upper-division undergraduate UCSC computer science courses may be taken to strengthen a student's preparation for graduate studies. At most, 10 credits of UCSC upper-division undergraduate computer science courses (other than CMPS 101) may be counted toward the degree requirements.
- with the exception of 200, 280, 296, 297, and 299, 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 towards the M.S. degree requirements.
- courses that are taken to satisfy an undergraduate degree requirement cannot be counted towards the M.S. degree requirements. Undergraduates who are in their senior year at UCSC and are taking computer science upper-division courses or computer science graduate courses that are beyond their undergraduate degree requirements can count those courses as part of their M.S. degree should they apply to the computer science M.S. program.
- courses from other institutions may be substituted for equivalent courses at UCSC (with the approval of the graduate advisor and graduate committee) but may not count toward the 40-credit requirement of the computer science M.S. degree. For example, a

student may substitute an equivalent course for CMPS 201 but may not count that course toward the 40-credit requirement. As another example, a student may substitute an equivalent graduate course for CMPS 260 and count that as breadth but may not count that course toward the 40-credit requirement or as part of the 25 credits from computer science.

Each student must complete CMPS 200 in their first year.

Each student must complete CMPS 201 or a course to prepare the student for CMPS 201 in their first year, after which CMPS 201 should be completed by the end of the second year.

Each student must complete CMPS 203 or a course to prepare the student for CMPS 203 in their first year, after which CMPS 203 should be completed by the end of the second year.

Each student must complete Computer Engineering 110 or Computer Engineering 202 in their first year.

#### Project

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Completion of a master's project is required for the master's degree. In consultation with the adviser, the student forms a master's project reading committee of at least two faculty members, each of whom is provided a copy of the project report. The final project must be accepted by the review committee before the award of the master of science degree.

### REQUIREMENTS FOR THE COMPUTER SCIENCE MASTER'S DEGREE: THESIS TRACK

#### Course Requirements

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Each student is required to take 43 credits as follows:

- Computer Science 200, Research and Teaching in Computer Science and Engineering, 3 credits;
- Computer Science 201, Analysis of Algorithms, 5 credits;
- Computer Science 203, Programming Languages, 5 credits;
- Computer Science 299, Thesis Research, 5 credits;
- a base requirement in computer architecture must be met by taking Computer Engineering 110 (grade B or higher) or Computer Engineering 202. Computer Engineering 110 can be taken to meet the architecture requirement, however, the credits will not be counted toward graduation requirements;
- one course each from three different breadth categories for a total of three courses (15 credits)—see [www.cs.ucsc.edu/graduates/breadth/](http://www.cs.ucsc.edu/graduates/breadth/)

## Computer Science

- all remaining courses must be regular, 5-credit graduate courses from computer science courses that do not count include all courses numbered 200, 280, 296, 297, and 299
- at least 25 credits must be in computer science
- upper-division undergraduate UCSC computer science courses may be taken to strengthen a student's preparation for graduate studies. At most, 10 credits of UCSC upper-division undergraduate computer science courses (other than CMPS 101) may be counted toward the degree requirements.
- with the exception of 200, 280, 296, 297, and 299, 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.
- courses that are taken to satisfy an undergraduate degree requirement cannot be counted toward the M.S. degree requirements. Undergraduates who are in their senior year at UCSC and are taking computer science upper-division courses or computer science graduate courses that are beyond their undergraduate degree requirements can count those courses as part of their M.S. degree should they apply to the computer science M.S. program.
- courses from other institutions may be substituted for equivalent courses at UCSC (with the approval of the graduate advisor and graduate committee) but may not count towards the 40-credit requirement of the computer science M.S. degree. For example, a student may substitute an equivalent course for CMPS201 but may not count that course towards the 40-credit requirement. As another example, a student may substitute an equivalent graduate course for CMPS2 60 and count that as breadth but may not count that course toward the 40-credit requirement or as part of the 25 credits from CMPS

Each student must complete CMPS 200 in their first year.

Each student must complete CMPS 201 or a course to prepare the student for CMPS 201 in their first year, after which CMPS 201 should be completed by the end of the second year.

Each student must complete CMPS 203 or a course to prepare the student for CMPS 203 in their first year, after which CMPS 203 should be completed by the end of the second year.

Each student must complete Computer Engineering 110 or Computer Engineering 202 in their first year.

## Thesis

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Completion of a master's thesis is required for the master's degree. 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 adviser. In consultation with the adviser, 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. The student presents an expository talk on the thesis research, and the final thesis must be accepted by the review committee before the award of the master of science degree.

## REQUIREMENTS FOR THE PH.D. DEGREE

### Course Requirements

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Each student is required to take 58 credits as follows:

- CMPS 200, Research and Teaching in Computer Science and Engineering, 3 credits;
- CMPS 201, Analysis of Algorithms, 5 credits;
- CMPS 203, Programming Languages, 5 credits;
- a base requirement in computer architecture must be met by taking Computer Engineering 110 or Computer Engineering 202 or equivalent elsewhere (approval required); Computer Engineering 110 can be taken to meet the architecture requirement, however, the credits will not be counted toward degree requirements;
- one course each from three different breadth categories for a total of three courses (15 credits)—see [www.cs.ucsc.edu/graduates/breadth/](http://www.cs.ucsc.edu/graduates/breadth/);
- up to 10 credits of course 297, Independent Study or Research; or course 299, Thesis Research;
- all remaining courses must be regular, 5-credit graduate courses from: computer science, within the School of Engineering (with adviser's approval); or outside the School of Engineering (with adviser's and grad director's approval); courses that do not count include all courses numbered 200, 280, 296, 297, and 299;
- at least 33 credits must be in computer science;
- graduate courses (not seminars) in related disciplines outside the list of approved graduate courses may be substituted, when necessary to strengthen a student's preparation for graduate studies, with prior approval from the adviser and the graduate director. Course selection should form a coherent plan of study and requires adviser approval. Undergraduate courses may not be used to satisfy Ph.D. course requirements;

## Computer Science

- 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.

Ph.D. students who have satisfied the requirements for the master's degree are eligible to receive a masters degree.

### Examinations and Dissertation

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To continue in the Ph.D. program, students must pass a preliminary examination in their chosen research area by the end of their third year. Preliminary examinations are held during the first three weeks of each spring quarter; students must petition the computer science graduate committee for an examination in their chosen area two weeks before the end of winter quarter.

Examination committees consist of four faculty members, two chosen by the student and two by the computer science graduate committee. The format of this oral examination is up to the examination committee; the examination will typically evaluate both general knowledge of the chosen area and specific understanding of selected technical papers. The preliminary examination requirement is waived for students who advance to candidacy by the end of their third year.

Each student writes a Ph.D. dissertation. 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 labs, or elsewhere are recognized (and may be required) as an integral part of the research leading to the dissertation. As the first step, a student submits a written dissertation proposal to a School of Engineering faculty member. By accepting the proposal, the faculty member becomes the dissertation supervisor. The dissertation proposal is publicly and formally presented in an oral qualifying examination given by a qualifying examination committee, approved by the graduate committee. The student must submit his or her written dissertation proposal to all members of the committee and the graduate assistant one month in advance of the examination.

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 filing fee. Students who have

not advanced to candidacy by the end of their fourth year will be placed on academic probation.

Each Ph.D. candidate submits the completed dissertation to a 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 and attending faculty, 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.

### Transfer Credit

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Up to three School of Engineering courses fulfilling the degree requirements of either the M.S. or Ph.D. degrees may be taken before beginning the graduate program through the concurrent enrollment program.

Ph.D. students who have previously earned a master's degree in a related field at another institution may substitute courses from their previous university with approval of the adviser and the graduate committee.

Courses from other institutions may not 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 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

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Each year, 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 courses per quarter. Full-time computer science students must complete course 201, Computer Engineering 202, and course 203 within two years and normally must complete all course requirements within two years for the M.S. and three years for the Ph.D.

## Computer Science

Ph.D. students who have not advanced to candidacy by the end of their fourth year will be placed on academic probation.

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 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.

Should any computer science graduate student fail a School of Engineering course while on probation, the Computer Science 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.

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## COMPUTER SCIENCE FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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#### **Martín Abadi, Emeritus**

#### **Dimitris Achlioptas**

Analysis of algorithms, machine learning, random structures

#### **Luca de Alfaro**

Reputation systems, crowdsourcing, game theory, formal methods

#### **Scott A. Brandt**

Operating systems, storage systems, real-time systems

#### **James E. Davis**

Information and Communication Technologies for Development (ICTD), technology for global social issues, human computation, computational photography, computer vision, computer graphics

#### **Cormac Flanagan**

Programming languages, computer security, web programming, concurrency, verification, type systems, dynamic analysis

#### **Lise Getoor**

Machine learning, reasoning under uncertainty, analysis of graphs and networks, artificial intelligence, databases, information integration, visual analytics, data science

#### **David P. Helmbold**

Machine learning, computational learning theory, analysis of algorithms

#### **Harry D. Huskey, Emeritus**

#### **Phokion G. Kolaitis**

#### **Baskin Distinguished Professor**

Principles of database systems, logic in computer science, and computational complexity

#### **Robert A. Levinson, Emeritus**

#### **Suresh K. Lodha**

Data analytics and visualization, vision, innovation, technology for social good

#### **Darrell D. E. Long**

#### **Kumar Malavalli Endowed Chair in Storage Systems**

Data storage systems, distributed computing, operating systems, performance evaluation, reliability, cyber security, data science, multimedia

#### **Charles E. McDowell**

Programming languages, parallel computing, and computer science education

#### **Ethan L. Miller,**

#### **Symantec Presidential Chair for Storage and Security**

Archival storage; non-volatile memory and next-generation storage; storage security and reliability; file system metadata and search, computer security; scalable and distributed systems

#### **Alex T. Pang**

Uncertainty visualization, tensor visualization, scientific visualization, comparative visualization, collaboration software, virtual reality interfaces

#### **Ira Pohl, Emeritus**

#### **Wang-Chiew Tan**

Data management, data integration and exchange, data provenance, crowdsourcing, and scientific databases

#### **R. Michael Tanner, Emeritus**

#### **Allen Van Gelder**

Logic programming algorithms, parallel algorithms, complexity, programming languages, automated theorem proving, scientific visualization

#### **S.V.N. Vishwanathan**

Analysis of algorithms, optimization for machine learning, structural prediction

#### **Marilyn Walker (joint with Computational Media)**

Dialogue systems, natural language processing, computer games, human-computer interaction, machine learning, artificial intelligence

## Computer Science

### **Manfred K. Warmuth**

Online learning, machine learning, statistical decision theory, game theory, analysis of algorithms

ASSISTANT PROFESSOR

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### **Seshadhri Comandur**

Sublinear algorithms, theoretical foundations for massive data, social network analysis

**Acting Assistant Professor**

### **Peter Alvaro**

Data management systems, distributed systems, logic programming

**Visiting Professor**

### **Neoklis Polyzotis**

Databases, online database turning, crowdsourcing, and scientific data management

ADJUNCT PROFESSOR

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### **Carlos Maltzahn**

Scalable file system data and metadata management, storage Quality of Service (QoS), data management games, network intermediaries, information retrieval and cooperation dynamics

### **Linda Werner**

Software engineering, computer science education, children and computer game creation, testing, increasing diversity in computer science

**Associate Adjunct**

### **Balder ten Cate**

Data management, logic, algorithms, and complexity

### **Thomas Schwarz**

Reliability and security in storage systems

**Lecturer**

### **Wesley Mackey**

Compiler construction, programming languages

### **Patrick Tantalo**

Graph theory, combinatorics, optimization, algorithms



### **Lawrence Andrews (Film and Digital Media)**

Documentary, sound, animation, installation

### **Alexandre Brandwajn, Emeritus (Computer Engineering)**

### **Pak K. Chan, Emeritus (Computer Engineering)**

### **Gabriel Elkaim (Computer Engineering)**

Embedded systems; robust software architectures for real-time reactive systems; sensor fusion; guidance, navigation, and control (GNC) system identification; robust and advanced control schemes; feedback control systems; robotics; unmanned autonomous vehicles (UAVs); and cooperative control

### **F. Joel Ferguson (Computer Engineering)**

Fault diagnosis, failure analysis, logic fault modeling, digital test pattern generation, design-for-test of digital circuits and systems

### **J. J. García-Luna-Aceves (Computer Engineering; Technology Management)**

### **Jack Baskin Chair of Computer Engineering**

Principles of computer communication, Internet, mobile and pervasive computing, wireless networks, information centric networks, network science

### **David Haussler (Biomolecular Engineering)**

Bioinformatics, genomics, computational genomic data analysis, molecular evolution and comparative genomics, genomic and clinical data sharing and standards, cancer genomics, neurodevelopment, stem cell research, immunogenomics, information theory, pattern recognition, machine learning, artificial intelligence, information theory, theoretical computer science

### **Richard Hughey (Biomolecular Engineering; Computer Engineering)**

Computer architecture, parallel processing, computational biology

### **Arnav Jhala (Computational Media)**

Artificial Intelligence: storytelling in games, intelligent machinima generation, smart graphics, and intelligent user interfaces

### **Kevin Karplus (Biomolecular Engineering)**

Genome assembly from next-generation sequence data (Formerly protein structure prediction), signal processing and statistics for nanopore signals

### **Tracy Larrabee (Computer Engineering)**

Test-pattern simulation and generation, fault modeling, fault diagnosis, design verification, technical writing, logic simulation

### **Patrick E. Mantey (Computer Engineering; Technology Management)**

### **Jack Baskin Chair of Computer Engineering**

Multimedia systems, digital signal processing, sensor systems and networks, real-time monitoring and control, image systems, image processing, visualization, geographic information systems, decision support systems

### **Michael Mateas (Computational Media)**

Artificial Intelligence (AI) for art and entertainment, game AI, AI and creativity, AI-based interactive storytelling, autonomous characters

### **Katia Obraczka (Computer Engineering)**

Computer networks, distributed systems, operating systems, Internet information systems, mobile computing, wireless networks

**Warren Sack (Film and Digital Media)**

Software design and media theory

**Martine D. F. Schlag (Computer Engineering)**

VLSI design tools and algorithms, VLSI theory, field-programmable gate arrays, FPGA-based computing engines

**Barry Sinervo (Ecology and Evolutionary Biology)**

Animal behavior, evolution, physiological ecology

**Anujan Varma (Computer Engineering)**

Computer networking, computer architecture, optical networks

**Noah Wardrip-Fruin (Computational Media)**

Digital media, computer games, electronic literature, software studies

**E. James Whitehead Jr. (Computational Media)**

Software engineering, software evolution, software bug prediction, level design in computer games, procedural content generation

**W. Todd Wipke, Emeritus (Chemistry and Biochemistry)**

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## COMPUTER SCIENCE COURSES

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### LOWER-DIVISION COURSES

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**2. Computer Literacy.**

Introduction to how computers work and how to use them. Topics covered include network information systems, text editors, formatting, file and directory system, spreadsheets and databases. Computers as symbol manipulation devices. Introduction to programming concepts and computer languages. Impact of computers on society. Designed for students with little or no experience using computers. Preference is given to students who have not taken other computer engineering or computer science courses. Students cannot receive credit for this course and Computer Engineering 3. (General Education Code(s): PE-T, IN.) N. Polyzotis, The Staff

**5C. Introduction to Programming in C/C++.**

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. No prior programming experience required, but a mathematics background at the pre-calculus level is assumed. This course and courses 5J and 5P cover similar concepts, but use different programming languages.

This course is recommended for students that have a specific desire or need to learn C/C++; others are encouraged to consider taking course 5P or 5J which use languages that provide a gentler introduction to programming. (General Education Code(s): MF, IN.) C. McDowell, D. Long

**5J. Introduction to Programming in Java. F,W,S**

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 courses 5C and 5P cover similar concepts, but use different programming languages. Because 5J followed by course 11 is a two-quarter alternative to the accelerated course 12A/L, engineering majors and students planning on continuing the programming sequence are encouraged to take 5J rather than 5C or 5P. Students may not receive credit for 5J taken concurrently or subsequently to course 12A, 12B, or Computer Engineering 13. (General Education Code(s): MF, IN.) P. Tantalio, D. Helmbold, C. McDowell

**5P. Introduction to Programming in Python. W,S**

Introduces programming in Python, a high-level programming language used in the physical and social sciences and for Internet scripting. Students learn programming and documentation skills, as well as algorithmic problem-solving, coding, and debugging methodologies. Students write programs to solve sample problems drawn from a wide range of disciplines, primarily in the sciences. No prior programming experience is required, but a mathematics background at the pre-calculus level is assumed. This course and courses 5C and 5J cover similar concepts, but use different programming languages. Students may not receive credit for course 5P after receiving credit for course 11, 12A, or Computer Engineering 13. (General Education Code(s): MF, IN.) D. Long, E. Miller

**10. Introduction to Computer Science. F,W,S**

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

## Computer Science

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 course 12B. (General Education Code(s): MF, IN.) The Staff, N. Whitehead, P. Tantalo, M. Walker, S. Lodha, C. McDowell, C. Flanagan

### **11. Intermediate Programming. W,S**

Continuation of course 5J. Covers basic object-oriented programming, event-driven programming, graphical user interface (GUI) creation, recursion, two-dimensional arrays. The two-quarter sequence courses 5J and 11 cover in two quarters the same material as the accelerated introductory course and lab 12A/L cover in one quarter. Students cannot receive credit this course and course 12A. Prerequisite(s): course 5J, and Mathematics 3 or 11A or 19A or Applied Mathematics and Statistics 3 or Applied Mathematics and Statistics/Economics 11A or a score of 400 or higher on the mathematics placement examination (MPE). (General Education Code(s): MF.) C. McDowell, P. Tantalo

### **12A. Introduction to Programming (Accelerated). F,W,S**

Accelerated introduction to programming. Students write medium-sized programs. Topics include: functions; conditionals and loops; classes; event-driven programming and graphic user interfaces (GUIs); recursion; and arrays. Students who have no or very limited programming experience should consider courses 5J and 11 which cover the same

material in two quarters. Students may not receive credit for both this course and course 11. Some prior programming experience in a language such as C, C++, Java, or C# strongly recommended. Prerequisite(s): Mathematics 3 or 11A or 19A or Applied Mathematics and Statistics 3 or Applied Mathematics and Statistics/Economics 11A, or a score of 400 or higher on the mathematics placement examination (MPE). Concurrent enrollment in 12L required. (General Education Code(s): IN.) N. Whitehead, W. Mackey, N. Polyzotis, D. Helmbold, C. Flanagan, A. Pang, C. McDowell, D. Long

### **12B. Introduction to Data Structures. F,W,S**

Teaches students to implement common data structures and the algorithms associated with each data structure, through progressively difficult exercises. Topics include big "O" notation; pointers, recursion (induction), and dynamic allocation; linked lists and list processing; stacks, queues, binary trees and binary search trees; simple sorting techniques and simple search techniques. Students will gain a working knowledge of the elements of the Java and C programming languages. Prior experience with Unix is assumed. Prerequisite(s): course 11 or 12A or Computer Engineering 13. Concurrent enrollment in course 12M required. (General Education Code(s): MF, IN.) N. Whitehead, W. Mackey, P. Tantalo

### **12L. Computer Programming Laboratory (2 credits). F,W,S**

Laboratory sequence complementing topics taught in course 12A by providing training and exposure to several software development tools and practices not covered in course 12A. In

addition, the lab provides an initial exposure to a second programming language to reinforce concepts from course 12A. Concurrent enrollment in course 12A is required. N. Whitehead, W. Mackey, N. Polyzotis, D. Helmbold, C. Flanagan, A. Pang, C. McDowell, D. Long

### **12M. Data Structures Laboratory (2 credits). F,W,S**

Complements course 12B, gaining additional competence with a number of important software development tools, languages, and techniques. Included are advanced Unix features and utilities such as grep, find, diff, the shell, and pipes; C programs utilizing I/O, arrays, pointers, and structures; a scripting language to perform simple text and file manipulation; and the make utility. Concurrent enrollment in course 12B required. N. Whitehead, W. Mackey, P. Tantalo

### **13H. Introduction to Programming and Data Structures (Honors). F**

Provides an accelerated introduction to programming and data structures. Includes a review of basic programming, including loop and conditional control structures, procedures and parameter passing, and arrays. Course goes on to cover the same material as course 12B. Students cannot receive credit for this course and course 12A or 12B. Prerequisite(s): Students must have completed a high school or college-level programming course in Java, C, or C++. An entrance examination is given to ascertain programming level; enrollment contingent on passing this examination. Concurrent enrollment in course 13L is required. (General Education Code(s): IN.) D. Long

**13L. Introduction to Programming and Data Structures Laboratory (2 credits).**

**F**  
Provides an accelerated introduction to the practical aspects of programming and data structures. Covers three areas: 1) common programming tools, including Unix commands, compilers and linkers, editors, debuggers, and Makefiles; 2) basic programming techniques, including design, testing, and debugging; and 3) C programming, focusing on the major differences between C and Java. Previous or concurrent enrollment in course 13H is required. Prerequisite(s): Students must have completed a high school or college-level programming course in Java, C, or C++. An entrance examination is given to ascertain programming level; enrollment contingent on passing this examination. Concurrent enrollment in course 13H is required. D. Long

**17. Social Networks. S**

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. Prerequisite(s): Mathematics 3 or 11A; or Applied Mathematics and Statistics 2 or 3 or 6 or 11A or 15A; or Economics 11A; or score on math placement exam of 31 or higher. (General Education Code(s): SR.) B. Ten Cate, P. Kolaitis

**60M. Scientific Computation with Matlab and Maple.**

Basic concepts from calculus visualized using Matlab and Maple; plotting data and functions, integration, differentiation, limits; solving systems of equation; linear regression; and example

applications from science and engineering. Prerequisite(s): Mathematics 19B, or 20B, or by consent of instructor. M. Warmuth

**80B. Systems and Simulation.**

An introduction to systems analysis as an approach to understanding and solving complex problems. The use of simulation as an aid in this problem solving. Examples are taken from ecology, economics, physics, computer science, and other fields. Intended as a generally accessible undergraduate course in which students can develop and explore computer simulation models matched to their individual interests. (General Education Code(s): T2-Natural Sciences, Q.) The Staff

**80G. Introduction to Unix.**

Introduction to computing, the Internet, and the World Wide Web through the language of the Unix operating system. Oriented to the beginner, the course presupposes no previous acquaintance with any particular sort of computer. It covers the basic concepts of text editing and formatting, writing Web pages in basic HTML, and promotes a rigorous understanding of Unix commands and shell scripts. Views communication with a computer as a matter of learning a few simple though powerful languages. (General Education Code(s): T2-Natural Sciences.) The Staff

**80J. Technology Targeted at Social Issues.**

Introduces the idea that engineering can be a means for addressing social issues. Case studies and guest speakers. Issues might include: economic development, privacy, activism, safe drinking water, inexpensive shelters, sustainable energy, education, and waste disposal. (General Education Code(s): PE-T,

T7-Natural Sciences or Social Sciences.) J. Davis, S. Lodha

**80L. Social Data Analysis and Visualization. W**

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. (General Education Code(s): SR.) S. Lodha

**80S. From Software Innovation to Social Entrepreneurship.**

Emerging software innovations with emphasis on social software. Web 2.0 companies and services. Software that has social impact in a global context. Entrepreneurial plan including social, economic, and innovation value. Final group project on innovative software design and entrepreneurship plan. (General Education Code(s): PE-T, T7-Natural Sciences or Social Sciences, E.) S. Lodha

**80V. Creating Virtual Worlds on the Web.**

Project-oriented course about creating and publishing interactive 3D content on the web. Focuses on the creation of static and dynamic objects, such as characters, terrain, accessories, and works of art. Also covers inclusion of animation and sound effects with these objects. The objects created can be used in a stand-alone setting (e.g., a 3D document) or incorporated into existing virtual worlds (e.g., as part of a level design in a computer game or assets in massively multiplayer online games). Uses 3D authoring

## Computer Science

tools (pending availability of resources) like VRML, Second Life, Alice, and/or Acrobat 3D. (Formerly VRML 3D Worlds on the Web.) (General Education Code(s): PR-C, T2-Natural Sciences.) A. Pang

### **94. Group Tutorial. F,W,S**

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. May be repeated for credit. The Staff

### **94F. Group Tutorial (2 credits). F,W,S**

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. May be repeated for credit. The Staff

### **99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **99F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## UPPER-DIVISION COURSES

### **101. Algorithms and Abstract Data Types. F,W,S**

Studies basic algorithms and their relationships to common abstract data types. Covers the notions of abstract data types and the distinction between an abstract data type and an implementation of that data type. The complexity analysis of common algorithms using asymptotic (big "O") notation is emphasized. Topics include sorting and searching techniques, basic graph algorithms, and algorithm design techniques. Abstract data types covered include priority queues, dictionaries, disjoint sets, heaps, balanced trees, and hashing. Familiarity with C,

Java, and Unix is assumed. Prerequisite(s): course 12B or 13H; CMPE 16 or 16H; MATH 19B, 20B or 11B; and one course from the following: MATH 21, 22, 23A, or AMS 10. P. Tantalò, D. Helmbold, A. Van Gelder, M. Warmuth

### **102. Introduction to Analysis of Algorithms. W,S**

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. Prerequisite(s): course 101. M. Warmuth, A. Van Gelder, D. Achlioptas, D. Helmbold, S. Lodha

### **104A. Fundamentals of Compiler Design I. F,S**

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. Prerequisite(s): course 101 and Computer Engineering 12 and 12L. W. Mackey

### **104B. Fundamentals of Compiler Design II.**

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 course 204. Taught in conjunction with course 204. Prerequisite(s): course 104A. W. Mackey

### **105. Systems Programming.**

Covers fundamentals of systems programming including standard tools, shell programming, file I/O, files and directories, system data files and information, Unix processes, process control, synchronization, signals, event-driven programming, terminal I/O, daemons, interprocess communication, basic network programming, and basic user-interface programming. Prerequisite(s): course 101 and Computer Engineering 12 and 12L. Enrollment restricted to School of Engineering majors. D. Long, E. Miller

### **109. Advanced Programming. W,S**

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(s): course 12B/M or 13H. C. McDowell, W. Mackey

### **111. Introduction to Operating Systems. W,S**

Fundamental principles of operating systems: process synchronization, deadlocks, memory management, resource allocation, scheduling, storage systems, and study of several operating systems. A major programming project will be required. Prerequisite(s): course

## Computer Science

101, and Computer Engineering 110 or Computer Engineering 112. E. Miller, D. Long, W. Mackey

### **112. Comparative Programming Languages. F,W**

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. Prerequisite(s): course 101 or 109. W. Mackey, W. Tan, C. McDowell, C. Flanagan, A. Van Gelder, D. Long

### **113. Parallel and Concurrent Programming. \***

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. (Also offered as Computer Engineering 113. Students cannot receive credit for both courses.) Prerequisite(s): Computer Engineering 12 and 12L and Computer Science 101. Computer Engineering 110 or 112 recommended. J. Renau Ardevol, E. Miller

### **115. Introduction to Software Engineering. F,S**

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 Software Methodology.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and course 101. Enrollment restricted to computer science, computer engineering, and technology and information management majors. E. Whitehead, L. Werner, C. Flanagan

### **116. Software Design Project. W**

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. Students are billed a materials fee. Prerequisite(s): course 115. (General Education Code(s): PR-E.) E. Whitehead, L. Werner, L. De Alfaro

### **117. Software Design Project II. S**

Continuation of course 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. Students are billed a materials fee. Prerequisite(s): course 116. E. Whitehead, L. Werner, L. De Alfaro

### **119. Software for Society.**

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. Prerequisite(s): course 101. (General Education Code(s): PE-T.)

J. Davis

### **121. Mobile Applications. W**

Introduces programming and application development for mobile devices. Covers the SDK and main programming platforms available on mobile devices, methodologies for developing native applications, division of computation between the mobile platform and servers, and mobile-to-server communications. Introduces platforms based on JavaScript and HTML5 for the development of applications that are portable across platforms. Students develop components of applications, leading to fully functional applications by the end of the course. Course based on emulators and SDK tools, so ownership of a cellphone/tablet is not required for the course. Prerequisite(s): courses 12B and 12M. L. De Alfaro, E. Whitehead

### **122. Computer Security. F**

Introduction to computer security (including selected topics in network security). Access control. Security in programming languages. Basic cryptography. Security protocols. Prerequisite(s): course 111 or permission of instructor. Enrollment restricted to School of Engineering majors. E. Miller

### **128. Distributed Systems: File Sharing, Online Gaming, and More. S**

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. Prerequisite(s):

## Computer Science

course 101 or Computer Engineering 150. Course 111 or 105 recommended. E. Miller, P. Alvaro, D. Long

### **129. Data Storage Systems. W**

Covers all aspects of storage systems technology from magnetic media up through system software, including principles of magnetic recording, hard drive technology and evolution, performance measurement, file systems, storage networking, disk arrays, network-attached storage, and alternative storage technologies.

Prerequisite(s): course 101, 111, and Physics 5A or 6A. E. Miller, D. Long, S. Brandt

### **130. Computational Models. F,S**

Various representations for regular languages, context-free grammars, normal forms, parsing, pushdown automata, pumping lemmas, Turing machines, the Church-Turing thesis.

Prerequisite(s): course 101. P. Tantalo, M. Warmuth, D. Helmbold, P. Kolaitis, A. Van Gelder

### **132. Computability and Computational Complexity.**

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. Prerequisite(s): course 130. M. Warmuth, D. Helmbold, P. Kolaitis, A. Van Gelder

### **132W. Computability and Computational Complexity (2 credits).**

Disciplinary Communication (DC) course to be taken concurrently with course 132. Students satisfy the DC requirement by writing a survey paper on a topic related to

computability and computational complexity. Possible topics include: an overview of a different model of computation (e.g., quantum computing); an overview of a major complexity class; a critical analysis of the Church-Turing thesis.

Prerequisite(s): course 130; satisfaction of the Entry Level Writing and Composition requirements. Concurrent enrollment in course 132 required. Enrollment by permission of instructor. Enrollment limited to 15. M. Warmuth, D. Helmbold, P. Kolaitis, A. Van Gelder

### **140. Artificial Intelligence. W**

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. Prerequisite(s): course 101. The Staff, L. Getoor, M. Walker

### **142. Machine Learning. W**

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. Prerequisite(s): course 101, Mathematics 23A, and Applied Mathematics and Statistics 131 or Computer Engineering 107. D. Helmbold, M. Warmuth

### **143. Introduction to Natural Language Processing. S**

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. Prerequisite(s): courses 5P and 101. Enrollment limited to 40. M. Walker

### **160. Introduction to Computer Graphics. S**

Introduces techniques of modeling, transformation, and rendering for computer-generated imagery. Topics: 2D/3D primitives, projections, matrix composition, and shading algorithms. Programming assignments and a major project are required. Students cannot receive credit for both this course and course 260. Prerequisite(s): course 101 and Mathematics 21 or Applied Mathematics and Statistics 10. Concurrent enrollment in course 160L required. A. Pang, J. Davis, S. Lodha

## Computer Science

### **160L. Introduction to Computer Graphics Laboratory (2 credits). S**

Complements course 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. Concurrent enrollment in course 160 required. A. Pang, J. Davis, S. Lodha

### **161. Introduction to Data Visualization.**

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 Visualization and Computer Animation.) Prerequisite(s): course 160 or equivalent. Concurrent enrollment in course 161L required. S. Lodha, A. Pang

### **161L. Data Visualization Laboratory (2 credits).**

Complements course 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 Visualization and Computer Animation Laboratory.) Concurrent enrollment in course 161 required. S. Lodha, A. Pang

### **162. Advanced Computer Graphics and Animation.**

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. Prerequisite(s): course 160 or equivalent. Concurrent enrollment in course 162L required. A. Pang, J. Davis, S. Lodha

### **162L. Advanced Computer Graphics and Animation Laboratory (2 credits).**

Complements course 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. Prerequisite(s): concurrent enrollment in course 162 is required. A. Pang, J. Davis, S. Lodha

### **165. Data Programming for Visualization. S**

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. Prerequisite(s): courses 12B and 12M. S. Lodha

### **166A. Game Theory and Applications I. F**

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. (Also offered as Technology & Info Management 166A. Students cannot receive credit for both courses.) Prerequisite(s): Applied Math and Statistics 5 or 7 or Economics 113; and Economics 11B, Applied Math and Statistics 11B, or Mathematics 11B or 19B. Enrollment restricted to juniors and seniors. Enrollment limited to 100. J. Musacchio

### **166B. Game Theory and Applications II. W**

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 Economics 272, Computer Science 272, or Biology: Ecology and Evolutionary 274. (Also offered as Economics 166B. Students cannot receive credit for both courses.) Prerequisite(s): course 166A or Economics 166A; satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to juniors and seniors. Enrollment limited to 40. (General Education Code(s): W.) The Staff

## Computer Science

### **180. Database Systems I. W**

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.

Prerequisite(s): course 101. W. Tan, P. Kolaitis, N. Polyzotis

### **180W. Database Systems (2 credits).**

Disciplinary Communication (DC) course to be taken concurrently with course 180. Students satisfy the DC requirement by producing a database design document, a document with comments on the source code for complex queries, and a literature survey or systems survey. Prerequisite(s): course 101, or permission of instructor; satisfaction of the Entry Level Writing and Composition requirements. Concurrent enrollment in course 180 required. Enrollment limited to 15. W. Tan, P. Kolaitis, N. Polyzotis

### **181. Database Systems II. S**

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.

Prerequisite(s): course 180. N. Polyzotis, W. Tan

### **182. Introduction to Database Management Systems. W**

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.

Prerequisite(s): course 12B. Course intended for non-majors; computer science majors should enroll in course 180. N. Polyzotis, W. Tan

### **183. Web Applications. F,W**

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 Hypermedia and the Web.)

Prerequisite(s): courses 12B and 12M. (General Education Code(s): PR-E.) L. De Alfaro, E. Whitehead

### **185. Technical Writing and Communication in Computer Science. W**

Writing and communication by computer science professionals to a technical audience. Geared toward students planning to pursue an advanced degree in computer science. Assignments include: cover letter and resume for job application, statement of purpose for graduate school application, algorithm description and analysis, user documentation, proposal preparation, critical analysis of published papers, survey of the literature, term paper, and oral presentations. Prerequisite(s): course 101 and satisfaction of the

Entry Level Writing and Composition requirements. Enrollment is restricted to computer science majors, or by permission of the instructor. May be repeated for credit. P. Kolaitis

### **191. Computer Science and Technology Seminar (2 credits).**

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. May be repeated for credit. The Staff

### **192. Supervised Student Teaching/Tutoring. F,W,S**

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. D. Helmbold

### **192F. Supervised Student Teaching/Tutoring (2 credits). F,W,S**

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

## Computer Science

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. D. Helmbold

### **193. Field Study. F,W,S**

Provides for individual programs of study with specific academic objectives carried out under the direction of a member of the Computer Science Department and using resources not normally available on campus. Credit is based on the presentation of evidence of achieving the objectives, usually a term paper or project. Cannot normally be repeated for credit. Students submit petition to sponsoring agency. The Staff

### **193F. Field Study (2 credits). F,W,S**

Provides for individual programs of study with specific academic objectives carried out under the direction of a faculty member of the Computer Science Department and a willing sponsor at the field site. Uses 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. Cannot normally be repeated for credit. Intended for students majoring in computer science. Students submit petition to sponsoring agency. The Staff

### **194. Group Tutorial. F,W,S**

A program of independent study arranged between a group of students and a faculty member. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **194F. Group Tutorial (2 credits). F,W,S**

A program of independent study arranged between a group of students and a faculty member. Intended for students majoring in computer science. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **195. Senior Thesis Research. F,W,S**

Students submit petition to sponsoring agency. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. The Staff

### **195F. Senior Thesis Research (2 credits). F,W,S**

Intended for majors. Students submit petition to sponsoring agency. The Staff

### **198. Individual Study or Research. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **198F. Individual Study or Research (2 credits). F,W,S**

Intended for majors. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

For fourth-year students majoring in computer science. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

For fourth-year students majoring in computer science. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## GRADUATE COURSES

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### **200. Research and Teaching in Computer Science and Engineering (3 credits). F**

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. Enrollment restricted to graduate students. The Staff, A. Pang, W. Tan

### **201. Analysis of Algorithms. F,W**

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. Enrollment restricted to graduate students; undergraduate students may enroll in this course if they have completed either course 102 or Computer Engineering 177 and have the consent of the instructor.

## Computer Science

A. Van Gelder, S. Vishwanathan, D. Achlioptas, D. Helmbold

### **203. Programming Languages. W,S**

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. Enrollment restricted to graduate students; undergraduate students may enroll for this course if they have completed course 112 and have the consent of the instructor. N. Whitehead, C. McDowell, A. Van Gelder, C. Flanagan

### **204. Compiler Design.**

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 course 104B. Taught in conjunction with 104B. Prerequisite(s): course 104A or equivalent. Enrollment restricted to graduate students. Offered in alternate academic years. W. Mackey

### **210. Computational Models and Complexity. W**

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. Prerequisite(s): course 201. M. Warmuth, S. Comandur, D. Helmbold, P. Kolaitis

### **211. Combinatorial Algorithms.**

Fundamental combinatorial algorithms, graph algorithms, flow problems, matching problems, linear programming, integer programming, NP-completeness, approximation algorithms for optimization problems. Prerequisite(s): course 201. Offered in alternate academic years. A. Van Gelder, D. Achlioptas, P. Kolaitis

### **217. Logic in Computer Science. S**

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. Enrollment restricted to graduate students. Offered in alternate academic years. P. Kolaitis, A. Van Gelder

### **221. Advanced Operating Systems. W**

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. Enrollment restricted to graduate students; undergraduates by interview only. D. Long, E. Miller

### **223. Advanced Computer Security.**

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. Enrollment restricted to graduate students or consent of instructor. D. Long, E. Miller

### **229. Storage Systems. S**

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. Enrollment restricted to graduate students. E. Miller, C. Maltzahn, D. Long

### **232. Distributed Systems. F**

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. Enrollment restricted to graduate students. E. Miller, C. Maltzahn, D. Long

### **240. Artificial Intelligence.**

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

## Computer Science

research issues in AI problem-solving methods. Individualized projects. Enrollment limited to 30. M. Walker, The Staff

### **241. Knowledge Engineering.**

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 course 140. Offered in alternate academic years. The Staff

### **242. Machine Learning. F**

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 course 142. Enrollment restricted to graduate students. Enrollment limited to 30. D. Helmbold, M. Warmuth

### **247. AI: Problem Solving and Intelligent Search.**

Surveys topics in contemporary deductive artificial intelligence (AI). Coursework involves weekly readings and a project. Prerequisite(s): courses 201 and 240. Enrollment restricted to graduate students. The Staff

### **250. Introduction to Information Theory. F**

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. (Also offered as Electrical Engineering 253. Students cannot receive credit for both courses.) Prerequisite(s): Computer Engineering 107, or Applied Mathematics and Statistics 131 or equivalent course, or permission of instructor. H. Sadjadpour

### **253. Advanced Programming Languages.**

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. Prerequisite(s): course 203 or equivalent. C. Flanagan

### **260. Computer Graphics.**

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 course 160.

Enrollment restricted to graduate students; undergraduates by interview only. Enrollment limited to 20. A. Pang, J. Davis, S. Lodha

### **261. Advanced Visualization. F**

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. Enrollment by permission of instructor. Enrollment restricted to graduate students. A. Pang

### **262. Computer Animation.**

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. Enrollment restricted to graduate students. Enrollment limited to 15. J. Davis, A. Pang

### **263. Data Driven Discovery and Visualization.**

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

## Computer Science

consent. Enrollment limited to 25. S. Lodha

### **272. Evolutionary Game Theory. W**

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 Economics 166B or Computer Science 166B. (Also offered as Biology:Ecology & Evolutionary 274. Students cannot receive credit for both courses.) M. Warmuth, B. Sinervo, D. Friedman

### **276. Software Engineering. S**

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 Computer Engineering 276.) Enrollment restricted to graduate students; undergraduates may enroll in this course if they have completed Computer Science 115. The Staff, L. De Alfaro, E. Whitehead

### **277. Principles of Database Systems. F**

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 Database Systems I.) Prerequisite(s): course 201 or equivalent or consent of instructor. Enrollment restricted to graduate students. Enrollment limited to 20. Offered in alternate academic years. W. Tan, P. Kolaitis, N. Polyzotis

### **278. Design and Implementation of Database Systems. W**

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 Database Systems II.) Prerequisite(s): course 181 (or equivalent) or consent of instructor. Enrollment restricted to graduate students. Enrollment limited to 20. N. Polyzotis

### **279. Software Reuse and Component-Based Software Engineering.**

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. Prerequisite(s): computer engineering 276 or consent of instructor. Enrollment restricted to graduate students. Enrollment limited to 20. C. McDowell

### **280A. Seminar in Computer Science Research (2 credits). F,W,S**

Weekly seminar covering topics of current research in computer science. Enrollment by permission of instructor. May be repeated for credit. The Staff

### **280D. Seminar in Database Systems (2 credits). S**

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. Enrollment limited to 30. May be repeated for credit. W. Tan, P. Kolaitis, N. Polyzotis

### **280G. Seminar on Software Engineering (2 credits).**

Weekly seminar covering topics of current research in software engineering. Prerequisite(s): permission of instructor. Enrollment restricted to graduate students. Enrollment limited to 30. May be repeated for credit. N. Whitehead, C. McDowell, C. Flanagan

### **280H. Seminar in Human Computation Systems (2 credits).**

Covers advanced topics and current research in the general area of

## Computer Science

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. Enrollment restricted to graduate students. May be repeated for credit. J. Davis, N. Polyzotis

### **280J. Seminar on Computer Graphics (2 credits).**

Weekly seminar covering topics of current research in computer graphics. Enrollment restricted to graduate students and by permission of instructor. Enrollment limited to 30. May be repeated for credit. J. Davis

### **280S. Seminar on Computer Systems (2 credits). F,W,S**

Weekly seminar series covering topics of current research in computer systems. Enrollment by permission of instructor. Enrollment limited to 30. May be repeated for credit. E. Miller, C. Maltzahn, D. Long

### **280Z. Seminar in Natural Language Processing and Dialogue (2 credits). F,W,S**

Covers advanced topics and current research in natural language processing. Focuses on student presentations and seminar participation. (Also offered as Computational Media 280Z. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **290A. Topics in Algorithms and Complexity Theory: Probabilistic Algorithms and Average Case Analysis.**

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. Enrollment restricted to graduate students. Enrollment limited to 15. Offered in alternate academic years. May be repeated for credit. D. Achlioptas

### **290B. Advanced Topics in Computer Graphics.**

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. Enrollment limited to 15. May be repeated for credit. A. Pang, J. Davis, S. Lodha

### **290C. Advanced Topics in Machine Learning. F,W**

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. Prerequisite(s):

course 242. May be repeated for credit. M. Warmuth, L. Getoor, D. Helmbold

### **290D. Neural Computation.**

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. Enrollment restricted to graduate students. Offered in alternate academic years. May be repeated for credit. M. Warmuth

### **290E. Object-Oriented Programming Methodology. W**

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. Prerequisite(s): courses 201 and 203. Enrollment restricted to graduate students. Enrollment limited to 20. May be repeated for credit. C. McDowell, I. Pohl

### **290F. Applications of Combinatorics.**

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. Prerequisite(s): Computer Engineering 16 and Applied Mathematics and Statistics 10. Enrollment restricted to graduate

## Computer Science

students and upper-division undergraduates. Offered in alternate academic years. May be repeated for credit. The Staff

### **290G. Topics in Software Engineering.**

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. Prerequisite(s): Computer Engineering 276 recommended. Enrollment restricted to graduate students; undergraduates may enroll with permission of instructor. Enrollment limited to 35. May be repeated for credit. E. Whitehead, C. McDowell, L. De Alfaro, C. Flanagan

### **290H. Topics in Database Systems. S**

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. Prerequisite(s): course 180 (or equivalent) or 277 or consent of instructor. Enrollment restricted to graduate students. Enrollment limited to 20. May be repeated for credit. W. Tan, P. Kolaitis, N. Polyzotis

### **290L. Topics in Crowdsourcing and Collaboration.**

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. Enrollment restricted to graduate students. L. De Alfaro, N. Polyzotis

### **290S. Advanced Topics in Computer Systems. W**

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. Prerequisite(s): course 221 recommended. Enrollment restricted to graduate students; qualified undergraduates may enroll with instructor's consent. May be repeated for credit. E. Miller, P. Alvaro, C. Maltzahn, D. Long

### **290T. Topics in Computing for Society.**

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. Enrollment restricted to graduate students. May be repeated for credit. J. Davis

### **290X. Cryptography and Computer Security.**

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. Enrollment limited to 12. May be repeated for credit. The Staff

### **296. Masters Project (2 credits). F,W,S**

Independent completion of a masters project under faculty supervision. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **297. Independent Study or Research. F,W,S**

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. May be repeated for credit. The Staff

### **297F. Independent Study or Research (2 credits). F,W,S**

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. Formerly offered as Directed Readings in Machine Learning. May be repeated for credit. The Staff

### **299. Thesis Research. F,W,S**

Thesis research conducted under faculty supervision. Although the course may be repeated for credit, not every degree program will accept a repeated course toward degree requirements. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# ELECTRICAL ENGINEERING

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2015-16 General Catalog

Baskin School of Engineering  
335 Baskin Engineering Building  
(831) 459-2158  
<http://www.soe.ucsc.edu>

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## PROGRAM DESCRIPTION

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### MISSION STATEMENT

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The mission of the Electrical Engineering (EE) Department is to build and sustain a teaching and research program to provide undergraduate and graduate students with inspiring and quality education in the theory and practice of hardware- and information-processing-oriented electrical engineering; serving industry, science, and government; and bringing faculty and staff a rewarding career in teaching, research, and service. The electrical engineering program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

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### SUMMARY OF OBJECTIVES

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The educational objectives that the Electrical Engineering Department strives to provide for students are focused in five areas: advance learning; professional development; adaption to technological change; leadership, teamwork and entrepreneurial skills; and ethics and societal issues.\*

\*This paragraph was revised on 03/16/16 for consistency with ABET accreditation.

Engineering is a profession that emphasizes analysis and design, and electrical engineers apply their knowledge to an expanding array of technical, scientific, and mathematical questions. A good engineering education has three parts: a sound foundation in mathematics and science, substantial design experience to develop skills and engineering aesthetics, and a focus in the humanities and social sciences to learn how and where to apply the skills developed. Electrical engineering is a very broad discipline; the program a UCSC complements existing campus programs, emphasizing three general areas: electronics/optics (including digital and analog circuits and devices); communications (including signal

and image processing and control); and VLSI design, micro-technology, nanotechnology, and biomedical devices.

The undergraduate curriculum provides a balance of engineering science and design. 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. Students interested in admission to the electrical engineering major should contact the Baskin School of Engineering Undergraduate Advising office, (831) 459-5840 or [advising@soe.ucsc.edu](mailto:advising@soe.ucsc.edu).

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### PROGRAM LEARNING OUTCOMES

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1. Fundamentals: Acquire instruction in the prerequisites for a career based on electrical engineering, including theory, design and the basic science upon which future technology will be based.
2. Theory and practical knowledge: Learn the theory and practical knowledge in hardware and information oriented electrical engineering, including a variety of opportunities for specialized further study.
3. Professional development: Learn the basis for a high-quality, professional approach to engineering, including skills in clear communication, teamwork, responsibility, high ethical standards, a desire for lifelong learning, and participation in the professional engineering community.

## Electrical Engineering

4. Preparation for an engineering career: Develop both individual creative skills for personal achievement as well as interpersonal skills for a team project environment, including an ability to apply research to engineering and learn how knowledge is applied in an industry setting.

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### ELECTRICAL ENGINEERING POLICIES

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#### ADMISSIONS POLICY

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Admission to the electrical engineering major is selective. First-year applicants may receive direct admission at the time they apply to UCSC based on their high school record and test scores. Students not directly admitted can apply to declare an electrical engineering major upon successful completion of all the following foundation courses with a GPA of 2.8 or better:

Mathematics 19A-B, Applied Mathematics and Statistics 10 and 20, Physics 5A/L, 5B/M, and 5C/N. Additionally students must complete an appropriate "Introduction to Engineering" class. At UCSC, the "Introduction to Engineering" classes are Electrical Engineering 80T (Recommended), Computer Engineering 80H, or Technology and Information Management 80C.

Students who have not met this GPA requirement are required to meet with the Electrical Engineering Undergraduate Director. Please refer to the School of Engineering section of the catalog for the full admissions policy.

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.

#### COURSE SUBSTITUTION

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Please refer to the School of Engineering section of the catalog for the policy regarding course substitution.

#### LETTER GRADE POLICY

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The Electrical Engineering Department requires letter grading for all courses applied toward the bachelor of science (B.S.) degree.

#### HONORS IN THE MAJOR

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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 receive highest honors. Students with a GPA of 3.3, 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.

#### TRANSFER STUDENTS

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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 foundation courses as possible. For electrical engineering majors, the following courses, or their equivalents, should be completed prior to transfer: first year calculus (Mathematics 19A-B), linear algebra (Applied Mathematics and Statistics 10 or Mathematics 21), differential equations (Applied Mathematics and Statistics 20 or Mathematics 24), a year of calculus-based physics courses (accepted as equivalent to Physics 5A/L, 5B/M, 5C/N). To ensure timely graduation, it is strongly recommended (but not required) that two programming courses (accepted as equivalent to Computer Engineering 12/L or Computer Engineering 13/L) and Multivariable Calculus (accepted as equivalent to Mathematics 23A and 23B) be taken prior to transfer. An applicant will be approved, conditionally approved, or declined. Only students who have completed most or all of the foundation courses will be approved for acceptance into the major.

Students who are approved for acceptance and who have course credit for all the foundation courses for the major must declare the major in their first term of enrollment at UCSC. The status of students who are approved for acceptance but who, upon review of their transcripts, are found not to have course credit for all the foundation courses for their major will be required to complete those courses before they can declare the major.

#### SCHOOL OF ENGINEERING POLICIES

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Please refer to the School of Engineering section of the catalog for additional policies that apply to all School of Engineering programs.

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### REQUIREMENTS OF THE MAJOR

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In addition to completing UCSC's general education requirements, students must complete 15 lower-division science and engineering courses, plus associated laboratories; nine upper-division engineering courses, plus associated laboratories; four

## Electrical Engineering

engineering electives; and a two-quarter comprehensive senior design project course. To plan for completion of these requirements within the normative time, students should consult with an adviser at the Baskin School of Engineering Undergraduate Advising office as early as possible.

### LOWER-DIVISION REQUIREMENTS

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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 15 lower-division courses (including corresponding laboratories). These courses form part of the prerequisite sequence and should be completed during the first two years at UCSC. The requirements are rigorous; students must be prepared to begin these courses early in their studies.

#### **Electrical Engineering**

80T, Modern Electronic Technology and How It Works

#### **Computer Engineering/Computer Science**

Computer Engineering 12/L, Computer Systems and Assembly Language/ Laboratory

Computer Engineering 13/L, Computer Systems and C Programming/Laboratory or Computer Science 12A/L, Introduction to Programming (Accelerated)/Laboratory

Computer Engineering 16, Applied Discrete Mathematics

Computer Engineering 80E, Engineering Ethics

#### **Mathematics**

19A-B, Calculus for Science, Engineering, and Mathematics

23A-B, Multivariable Calculus

#### **Applied Mathematics and Statistics**

10, Mathematical Methods for Engineers I

20, Mathematical Methods for Engineers II

#### **Physics**

5A/L, 5B/M, 5C/N, Introduction to Physics/Laboratories

5D, Heat, Thermodynamics, and Kinetics

#### **Ethics**

Students must take one of the following courses (required even for transfer students who have had their general education requirements waived):

Computer Engineering 80E, Engineering Ethics

Philosophy 22, Introduction to Ethical Theory

Philosophy 24, Introduction to Ethics: Contemporary Moral Issues

Philosophy 28, Environmental Ethics

Biomolecular Engineering 80G/Philosophy 80G, Bioethics in the 21st Century: Science, Business, and Society

### UPPER-DIVISION REQUIREMENTS

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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 nine upper-division courses, with associated laboratories:

#### **Electrical Engineering**

101/L, Introduction to Electronic Circuits/Laboratory

103/L, Signals and Systems/Laboratory

135/L, Electromagnetic Fields and Waves/Laboratory

145/L, Properties of Materials/Laboratory

151, Communications Systems

171/L, Analog Electronics/Laboratory

#### **Computer Engineering**

100/L, Logic Design/Laboratory

107, Mathematical Methods of Systems Analysis: Stochastic

185, Technical Writing for Computer Engineers

Required Electives. In addition to completing the above required courses, electrical engineering majors must complete four elective courses chosen from the list below. At least three must be from one of the depth-sequence concentrations listed. 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 web site for course descriptions: [www.ee.ucsc.edu/](http://www.ee.ucsc.edu/).

#### **Electronics/Optics Concentration**

##### **Electrical Engineering**

104, Bio-electronics and Bio-instrumentation

115, Introduction to Micro-Electro-Mechanical-Systems Design

130/L/ 230, Introduction to Optoelectronics and Photonics and Laboratory/Optical Fiber Communication

136, Engineering Electromagnetics (strongly recommended)

154/241, Feedback Control Systems, and Introduction to Feedback Control Systems

157/L, RF Hardware Design/Laboratory

## Electrical Engineering

172/221, Advanced Analog Circuits/Advanced Analog Integrated Circuits

173/L, High-Speed Digital Design/Laboratory

175/L, Energy Generation and Control/Laboratory

176/L, Energy Conversion and Control/Laboratory

177/L, Power Electronics/Laboratory

178, Device Electronics

180J, Renewable Energy Sources in Practice

211, Introduction to Nanotechnology

213, Micro/Nano-characterization of Materials

231, Optical Electronics

### Computer Engineering

118/L, Introduction to Mechatronics/Laboratory

121/L, Microprocessor System Design/Laboratory (strongly recommended)

167/L, Sensing and Sensor Technologies

### Communications, Signals, Systems, and Controls Concentration

#### Electrical Engineering

130/L/230, Introduction to Optoelectronics, and Photonics and Laboratory/Optical Fiber Communication

136, Engineering Electromagnetics (strongly recommended)

152/252, Introduction to Wireless Communications and Wireless Communications

153/250, Digital Signal Processing/Digital Signal Processing

154/241, Feedback Control Systems and Introduction to Feedback Control Systems

251, Principles of Digital Communications

253, Introduction to Information Theory

261, Error Control Coding

262, Statistical Signal Processing I

264, Image Processing and Reconstruction

#### Computer Engineering

118/L, Introduction to Mechatronics/Laboratory

150/L, Introduction to Computer Networks/Laboratory

251, Error Control Coding (taught in conjunction with EE 261)

The senior-year curriculum enables students to pursue independent study with a faculty member. Electrical engineering students are encouraged to take advantage of the opportunity to work within a faculty member's research group as part of their educational experience.

Internship programs with local industry are also available.

### Disciplinary Communication (DC) Requirement

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in electrical engineering is satisfied by completing Computer Engineering 185.

### Comprehensive Requirement

The senior comprehensive requirement for electrical engineering majors is in two parts: a project course and assessment options.

#### Project Course

Students must complete one capstone design course that spans three quarters, Electrical Engineering 129A/B/C, or complete a senior thesis. 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. Current course choices include the following:

#### Electrical Engineering

129A/B/C, Engineering Design Project I, II, and III (12 credits total)

195, Senior Thesis Project (12 credits total)

#### Outcomes Assessment Options

The Electrical 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 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 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.

## ELECTRICAL ENGINEERING MAJOR PLANNERS

The following are two sample academic plans for students to complete during their first two years as preparation for the electrical engineering major.  
STARTING EE101/L WINTER SOPHOMORE YEAR

### Plan One

Fall	Winter	Spring
MATH 19A	MATH 19B	MATH 23A
PHYS 5A/L	PHYS 5B/M	PHYS 5C/N
college core	college core	AMS 10
Fall	Winter	Spring
MATH 23B	EE 101/L	EE 103/L
CMPE 12/L	AMS 20	CMPE 107
CMPE 16	EE 80T	
Fall	Winter	Spring
EE 145/L	EE 135/L	EE 171/L
PHYS 5D	EE 151	CMPE 13/L
UD elective	CMPE 100/L	CMPE 80E
Fall	Winter	Spring
EE 129A	EE 129B	EE 129C
UD elective (design)	UD elective	UD elective
CMPE 185	gen ed	gen ed

STARTING EE 101/L FALL JUNIOR YEAR

Plan Two		
Fall	Winter	Spring
MATH 3	MATH 19A	MATH 19B
CMPS 5J	EE 80T	CMPS 11
college core	college core	CMPE 12/L
Fall	Winter	Spring
PHYS 5A/L	PHYS 5B/M	PHYS 5C/N
AMS 10	AMS 20	MATH 23A
CMPE 16	CMPE 107	CMPE 100/L
Fall	Winter	Spring
EE 101/L	EE 135/L	EE 103/L
PHYS 5D	CMPE 185	EE 171/L
MATH 23B	UD elective	CMPE 80E

Plan Two		
Fall	Winter	Spring
EE 129A	EE 129B	EE 129C
EE 145/L	EE 151	UD elective
CMPE 121/L	gen ed	UD elective

Additional information about this program can be found on the department's web site at [www.ee.ucsc.edu](http://www.ee.ucsc.edu).

## 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.

### ELECTRICAL ENGINEERING MINOR REQUIREMENTS

Requirements for the minor in electrical engineering are the following:

#### Mathematics

Mathematics 19A-B, Calculus for Science, Engineering, and Mathematics

Mathematics 23A, Multivariable Calculus

Applied Mathematics and Statistics 10, Mathematical Methods for Engineers I, and 20, Mathematical Methods for Engineers II; or Mathematics 21, Linear Algebra and Mathematics 24, Ordinary Differential Equations

#### Science

Physics 5A/L or 6A/L, Mechanics and 5C/N or 6C/N, Electricity and Magnetism

### CORE REQUIREMENTS

#### Electrical Engineering

Electrical Engineering 101/L, Introduction to Electronic Circuits/Laboratory; and

Electrical Engineering 103, Signals and Systems; and

Electrical Engineering 171/L, Analog Electronics/Laboratory

#### Upper-Division Electives

At least 15 credits of upper-division or graduate electrical engineering courses, all chosen from one of the existing electrical engineering major tracks. All of

the upper-division electives must come from the same track.

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## GRADUATE PROGRAMS

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The Department of Electrical Engineering (EE) 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:

- Photonics and electronics focusing on VLSI, electronic and optoelectronic materials; devices, circuits and systems for information transmission; storage, processing, and display, especially for optical-fiber communications and lower-power, high-performance systems; biomedical device instrumentation and MEMS; and optofluidics;
- Signal processing and communications, including wireless communications, network information theory, digital signal processing, image and video processing;
- Remote sensing including wave propagation and scattering radar oceanography, and microwave remote sensing.
- Nanotechnology including applications to biomedicine, integrated optics for biomedical imaging, opto-thermo-electric energy conversion, near-field scanning optical microscopy, nano-magneto-optics, micro-mechanics and micro-fluidics.

Electrical Engineering enjoys a close relationship with the Departments of Applied Mathematics and Statistics, Computer Science, Computer Engineering, Biomolecular Engineering, Chemistry, Physics, Astronomy, and Molecular, Cell and Developmental Biology faculty. The Electrical Engineering faculty are affiliated with: 1) several federally funded and nationally recognized centers such as the Center for Adaptive Optics, and the Center for Biomolecular Science and Engineering; 2) state-funded centers such as the Institute for Quantitative Biology (QB3), the Center for Information Technology Research in the Interest of Society (CITRIS), and the Institute for Regenerative Medicine (CIRM); 3) privately funded centers such as the W.M. Keck Center for Nanoscale Optofluidics (CfNO), the W.M. Keck Center for Adaptive Optical Microscopy (CfAOM), and the Center for Sustainable Energy and Power Systems (CenSEPS). Many EE faculty participate in the University Affiliated Research Center (UARC) at NASA-Ames Research Center, which is managed by UCSC and in the Advanced Studies Laboratory, a partnership between UCSC and NASA-Ames Research Center. The department also has ties to nearby industry, employing electrical engineering professionals as visiting and adjunct faculty and arranging for students to gain practical

research experience through work in industrial labs. Indeed, the department strongly encourages students of all nationalities to seek practical training as part of their graduate education.

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 two years. M.S. students must complete a master's thesis. A Ph.D. degree is usually completed in four to six years. 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.

### REQUIREMENTS FOR THE MASTER'S DEGREE

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#### Course Requirements

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##### Thesis Track

Each student is required to take 45 credits which must consist of:

1. at least 15 credits must be satisfied with courses from the areas of emphasis defined above;
2. at least 25 credits of the total 45 credits must be satisfied through EE graduate courses; and
3. at most 10 credits of independent study (EE 297, EE 299) are counted toward the EE course requirements.

Total credits required for the M.S. degree = 45.

Note that each graduate course satisfying the above requirements typically covers 5 credits.

##### Thesis

Completion of a master's thesis is required for the master's degree. 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 adviser. In consultation with the adviser, 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. 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 review committee before the award of the master of science degree.

M.S. students admitted to continue to the Ph.D. program must pass a preliminary exam covering fundamental undergraduate coursework (see below).

### Comprehensive Examination Track

Each student is required to take 40 credits which must consist of:

(1) At least 15 credits must be satisfied with courses from the areas of emphasis defined above.

(2) At least 25 credits of the total 40 credits must be satisfied through EE graduate courses.

Total credits required for the M.S. degree = 40.

Each student must pass the comprehensive examination. Note that each graduate course satisfying the above requirements typically covers 5 credits.

The examination is administered once a year at the end of the spring quarter. The four areas of concentration are: 1. photonics; 2. electronics; 3. signal processing and communications; 4. nanotechnology. Students can choose only one area for the comprehensive examination. The comprehensive examination is in writing with individual problems that the students will solve. The faculty members in the different areas will prepare the examination questions based on the graduate courses in these areas. The examination will be administered in a single day in all four areas of concentration.

Note that Plan II (Comprehensive Examination Track) is the default option and students can select Plan I (Thesis Track) only if they can find a faculty sponsor.

### REQUIREMENTS FOR THE PH.D. DEGREE

#### Course Requirements\*

Each student is required to take 50 credits which must consist of:

- At least 20 credits in one of the four core areas of emphasis defined above.
- At least 30 of the total 50 credits must be satisfied through EE graduate courses.
- At most 10 credits of independent study (EE297, EE299) will be counted toward EE course requirements.

Total credits required for the Ph.D. degree = 50

\* 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 adviser and the electrical engineering graduate director.

#### 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 take a written

examination covering basic knowledge in electrical engineering. This examination will cover material from the following technical areas:

- Circuits at the level of Electrical Engineering 101
- Electromagnetics at the level of Electrical Engineering 135
- Systems and signals at the level of Electrical Engineering 103
- Materials at the level of Electrical Engineering 145
- Applied Mathematics and Statistics at the level of Computer Engineering 107, and Applied Mathematics and Statistics 10 and 20.

The student will choose three areas from the above list in which to be examined. If the student does not pass the preliminary examination, the electrical engineering graduate committee may allow the student to repeat the preliminary examination once. If the student is to leave the Ph.D. program, and the student wishes to obtain a master's degree prior to departure, all requirements for the master's degree must still be satisfied.

After the student passes the preliminary examination, the student begins work on a thesis prospectus in preparation for the qualifying examination. During this period the student finds an adviser willing to supervise the student's thesis research, works with the adviser to prepare for the qualifying examination, and assembles a dissertation reading committee, consisting of the student's research supervisor (chair of the committee) and three or four appropriate faculty members in electrical engineering and other relevant departments. The committee must consist of at least two ladder-rank, electrical-engineering, faculty members in addition to the student's supervisor.

#### 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.

## Electrical Engineering

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 may be recommended for academic probation.

### Dissertation and Advancement to Ph.D. Degree Candidacy

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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.

After advancement to candidacy, work on the thesis 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 thesis so that the latter requirement is clearly satisfied. The Ph.D. thesis 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

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Each Ph.D. candidate submits the completed dissertation to a Ph.D. thesis 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.

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## TRANSFER CREDIT

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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 by the electrical engineering graduate director.

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 an M.S. thesis).

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## REVIEW OF PROGRESS

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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 engineering graduate student fails a School of Engineering course while on probation, the Electrical 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.

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MATERIALS FEE

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Please see the section on fees under School of Engineering.

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ELECTRICAL ENGINEERING FACULTY AND PROFESSIONAL INTERESTS

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PROFESSOR

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**Benjamin Friedlander**

Digital communications, wireless communication system, array processing, adaptive signal processing

**Claire Gu, Emeritus**

**Michael Isaacson**

Nano- and microfabrication technology and applications to biomedical and diagnostic devices, nanocharacterization of materials with emphasis on the development of microscopy tools, novel modes of imaging, electron and light optics, renewable energy systems, STEM education

**Sung-Mo (Steve) Kang**

Low-power. High-speed VLSI circuit design and synthesis, RF circuits, biological circuits, mixed technology, mixed signal CAD

**Nobuhiko P. Kobayashi**

Physics and chemistry of complex functional materials; Group III-V compound semiconductor nanometer-scale structures and devices; mixed oxide nanometer-scale structures and devices; tailored nanomicroscale hybrid semiconductor structures for energy conversion devices and advanced electronics, Science Director of Advanced studies Laboratories, UCSC and NASA Ames Research Center)

**Joel Kubby**

Micro-Electro-Mechanical-Systems (MEMS), adaptive optics (AO), optical-MEMS, bio-MEMS, bio-imaging, AO microscopy, AO astronomy

**Kenneth Pedrotti**

Integrated circuit design for communications, analog electronics, radio frequency integrated circuits, low-phase-noise oscillators, frequency synthesis, VLSI clock distribution, optical communications, high-speed electronics for lightwave systems, devices for all optical networking and imaging

**Hamid Sadjapour**

Wireless communication systems, network information theory and scaling laws, performance analysis of wireless and social networks, routing and MAC protocol design for wireless networks

**Holger Schmidt**

Narinder Singh Kapany Endowed Chair in Optoelectronics  
Optofluidics, atom photonics, hollow-core photonics for biomedicine and quantum optics, nanomagnetism, nanomagneto-optics, single-particle spectroscopy, ultrafast optics

**John F. Vesecky**

HF radar design and construction and observation of ocean surface winds, waves and currents with applications to coastal and deep water ocean processes; project MEDSAT

**Donald Wiberg, Emeritus (UCLA)**

ASSISTANT PROFESSOR

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**Allie Fletcher**

Statistical signal processing, information theory, computational neuroscience

**Ali A. Yanik**

Nano-plasmonics and metamaterials. Lab-on-chip systems: optofluidic BioNEMS, nano-fluidics and label-free biosensors. Nano-spectroscopy: plasmonic nano-antennas and single molecule vibrational dynamics. Rare cell isolation and single cell analysis: circulating tumor cells, plasmonic nano-tweezers and phononic crystals for flow cytometry. Nano-fabrication, soft lithography and biopatterning. Nano-electronics, spintronics, and thermoelectricity

LECTURER WITH SECURITY OF EMPLOYMENT

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**Stephen C. Petersen**

Embedded controller systems, RF wireless systems, modulation and spectrum reuse, digital signal processing, circuit theory

ADJUNCT PROFESSOR

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**Farid Dowla**

RF communications, radar, and signal and image processing

**Toshishige Yamada**

Modeling of micro/nanoscale electronic materials and devices emphasizing energy-band and equivalent-circuit methods; comparison of modeling and experiments: InP, InSb, ZnO, In<sub>2</sub>O<sub>3</sub>, and GaAs semiconducting nanowires; carbon

## Electrical Engineering

nanotubes/nanofibers devices; Si atomic chain devices; metallic nanoislands; strained Si/Ge channels; GaAs lateral surface superlattice; Josephson devices, etc.

### ASSISTANT ADJUNCT PROFESSOR

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#### **Kenneth Laws**

HF radar sensing of ocean surface currents, HF radar detection of ships, other applications of radar remote sensing, development of autonomous ocean surface vehicles for coastal marine sensing, and development of renewable energy sources

#### **Michael Oye**

Nanotechnology-based materials and devices for applications involving solar, piezoelectric, graphene, lighting, and chemical sensors

#### **Visiting Professor**

#### **Peyman Milanfar**

Statistical signal, image, and video processing; computational vision and photography; modeling and inverse problems in imaging; detection and estimation theory



#### **Sue Carter (Physics)**

Experimental condensed matter physics, polymer physics, molecular electronics, phase transitions, electronic and optical properties of materials

#### **David W. Deamer (Biomolecular Engineering, UC Davis Emeritus)**

Membrane biophysics, nanopore analysis, DNA sequencing, biomolecular self-assembly

#### **William Dunbar (Computer Engineering)**

Theory and application of feedback control, single-molecule biophysics, nanopore sensors, dynamics and control of biomolecules

#### **Gabriel Elkaim (Computer Engineering)**

Embedded systems; robust software architectures for real-time reactive systems; sensor fusion; guidance, navigation, and control (GNC) system identification; robust and advanced control schemes; feedback and control systems; robotics; unmanned autonomous vehicles (UAVs); cooperative control

#### **J.J. Garcia-Luna-Aceves (Computer Engineering; Technology Management)**

Principles of computer communication, Internet, mobile and pervasive computing, wireless networks, information centric networks, network science

#### **Matthew R. Guthaus (Computer Engineering)**

Health sensor systems, digital health, mobile health applications, integrated circuits and chip design (VLSI),

electronic computer-aided design (ECAD), low-power circuits, mobile and pervasive computing

#### **Ronnie D. Lipschutz (Politics)**

International relations; global political economy; globalization; foreign policy; resource/environmental politics; global political networks; global civil society and social movements; popular culture and politics; technology and society; risk society

#### **Darrell D. E. Long (Computer Science)**

Kumar Malavalli Endowed Chair in Storage Systems  
Data storage systems, distributed computing, operating systems, performance evaluation, reliability, cyber security, data science, multimedia

#### **Roberto Manduchi (Computer Engineering)**

Computer vision and sensor processing, with application to assistive technology for the visually impaired, mobile and pervasive computing

#### **Patrick E. Mantey (Computer Engineering; Technology Management)**

**Jack Baskin Chair of Computer Engineering**  
Multimedia systems, digital signal processing, sensor systems and networks, real-time monitoring and control, image systems, image processing, visualization, geographic information systems, decision support systems

#### **Claire Max (Astronomy and Astrophysics and UCO/Lick Observatory)**

Adaptive optics, planetary science

#### **Jose Renau (Computer Engineering)**

Health sensor systems, digital health, mobile health applications, integrated circuits and chip design (VLSI), electronic computer-aided design (ECAD), low-power circuits, mobile and pervasive computing

#### **B. Sriram Shastry (Physics)**

Condensed matter physics, strongly correlated matter, Mott-Hubbard physics, high T<sub>c</sub> superconductivity, quantum magnetism, exactly integrable systems, exactly solvable models of many-body systems and in statistical mechanics, quantum chaos, geometric frustration

#### **William T. Sullivan (Biology)**

Genetics, cell biology, development of the Drosophila embryo

#### **Jin Z. Zhang (Chemistry)**

Design, synthesis, characterization, and application of nanomaterials, including semiconductor and metal nanoparticles; femtosecond laser spectroscopy; ultrafast dynamics on surfaces and at interfaces; cancer biomarker detection; surface-enhanced Raman spectroscopy

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## ELECTRICAL ENGINEERING COURSES

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### LOWER-DIVISION COURSES

#### **80J. Renewable Energy Sources. S**

Introduction to energy storage and conversion with special emphasis on renewable sources. Fundamental energy conversion limits based on physics and existing material properties. Various sources, such as solar, wind, hydropower, geothermal, and fuel cells described. Cost-benefit analysis of different alternative sources performed, and key roadblocks for large-scale implementation examined. Latest research on solar cells and applications of nanotechnology on energy conversion and storage introduced. Students cannot receive credit for this course and course 81J. (General Education Code(s): PE-E, T2-Natural Sciences.) M. Isaacson

#### **80S. Sustainability Engineering and Practice. F**

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. (General Education Code(s): SR, T7-Natural Sciences or Social Sciences.) K. Monsen

#### **80T. Modern Electronic Technology and How It Works. W**

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. (General Education Code(s): SI, T7-Natural Sciences or Social Sciences, Q.) K. Pedrotti

#### **81C. Designing a Sustainable Future. S**

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. (Formerly Technological Innovation and Environmental Challenges.) (Also offered as College Eight 81C. Students cannot receive credit for both courses.) (General Education Code(s): SI, T-2 Natural Sciences.) The Staff

#### **94. Group Tutorial. F,W,S**

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. May be repeated for credit. The Staff

#### **94F. Group Tutorial (2 credits). F,W,S**

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. May be repeated for credit. The Staff

#### **99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

#### **99F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### UPPER-DIVISION COURSES

#### **101. Introduction to Electronic Circuits. F,W**

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. Prerequisite(s): Physics 5C/N or 6C/N, and Mathematics 24 or previous or concurrent enrollment in Applied Mathematics and Statistics 20 or 20A. Concurrent enrollment in course 101L is required. S. Petersen, S. Shin, J. Kubby

#### **101L. Introduction to Electronic Circuits Laboratory (2 credits). F,W**

Illustrates topics covered in course 101. One two-hour laboratory session per week. Students are billed for a materials fee. Prerequisite(s): Physics 5C/N or 6C/N; and Mathematics 24 or previous or concurrent enrollment in Applied Mathematics and Statistics 20 or 20A. Concurrent enrollment in course 101 is required. S. Petersen, S. Shin, J. Kubby

#### **103. Signals and Systems. F,S**

The course covers the following topics: characterization and analysis of continuous-time signals and linear systems, time domain

## Electrical Engineering

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. Prerequisite(s): courses 101/L and Applied Mathematics and Statistics 20 or 20A. B. Friedlander

### **103L. Signals and Systems Laboratory (2 credits). F,S**

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. Prerequisite(s): course 101 and 101L, and Applied Mathematics and Statistics 20 or 20A. Concurrent enrollment in course 103 required. B. Friedlander

### **104. Bio-electronics and Bio-instrumentations. W**

Focuses on the analysis, design, and measurement of components and systems of biomedical devices which interface biological systems with electronics mechanics, and optics. Topics include: abiotic/biotic interface; low-power analog/digital circuits and systems; signal integrity; energy harvesting; wireless techniques; regulatory/ethic compliance tailored for both invasive and non-invasive biomedical applications. Prerequisite(s): course 103. Enrollment restricted to juniors, seniors, and graduate students. The Staff

### **115. Introduction to Micro-Electro-Mechanical-Systems (MEMS) Design. S**

Begins with overview of MEMS devices and processes that are used to fabricate them. The basic governing equations for MEMS devices in different energy domains (mechanical, electrical, optical, thermal, and fluidic) reviewed, and both analytical and finite element coupled-domain modeling is used to design MEMS devices. Students work in teams to design, lay out, and fabricate MEMS devices and test structures using a standard multi-user process available through a foundry service. A presentation and term paper describing the design and layout will be required. Prerequisite(s): courses 101/L, 135/L, 145/L, Mathematics 19A and 19B, Mathematics 23A and 23B, and Mathematics 24 or Applied Mathematics and Statistics 20 or 20A, Physics 5A, 5B, 5C, and 5D. Enrollment limited to 15. J. Kubby

### **122A. Collaborative Sustainability Project Design.**

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 course 122.) Enrollment limited to 65. May be repeated for credit. M. Isaacson

### **122B. Collaborative Sustainability Project Implementation.**

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): course 122A. Students apply online; selected applicants complete in-person interviews. Enrollment is restricted to juniors and seniors. M. Isaacson

### **122C. Collaborative Sustainability Project Implementation.**

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

## Electrical Engineering

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): course 122A. Students apply online; selected applicants complete in-person interviews. Enrollment is restricted to juniors and seniors. M. Isaacson

### **123A. Engineering Design Project I. \***

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(s): Electrical Engineering 171 and Computer Engineering 100; previous or concurrent enrollment in Computer Engineering 185 and in at least one of the following: Electrical Engineering 157, Computer Engineering 121 or Computer Engineering 118; permission of department and instructor. Students are billed a materials fee. (General Education Code(s): PR-E.) The Staff

### **123B. Engineering Design Project II (7 credits). \***

Second of two-course sequence in engineering system design. Students fully implement and test

system designed and specified in course 123A. Formal written report, oral presentation, and demonstration of successful project to review panel of engineering faculty required. Students are billed a materials fee. Prerequisite(s): course 123A. The Staff

### **129A. Capstone Project I (2 credits). F**

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. Prerequisite(s): course 171; and Computer Engineering 100; and Computer Engineering 185; and previous or concurrent enrollment in course 157 or Computer Engineering 118 or Computer Engineering 121. Enrollment restricted to seniors. Enrollment by permission of instructor. S. Petersen

### **129B. Capstone Project II. W**

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. Students are billed a materials fee. Prerequisite(s): courses 129A and 171; and Computer Engineering 100; and Computer Engineering 185; and previous or concurrent enrollment in course 157 or Computer Engineering 118 or Computer Engineering 121. Enrollment restricted to seniors. Enrollment by permission of instructor. (General Education Code(s): PR-E.) S. Petersen, D. Munday

### **129C. Capstone Project III. S**

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. Students are billed a materials fee. Prerequisite(s): courses 129B and 171; and Computer Engineering 100; and Computer Engineering 185; and previous or concurrent enrollment in course 157 or Computer Engineering 118 or Computer Engineering 121. Enrollment restricted to seniors. Enrollment by permission of instructor. D. Munday, S. Petersen, J. Vesecky

### **130. Introduction to Optoelectronics and Photonics. F**

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 course 230. Prerequisite(s): Physics 5B and 5C, or 6B and 6C; concurrent enrollment in course 130L. A. Yanik

### **130L. Introduction to Optoelectronics Laboratory (1 credit). F**

Includes a series of projects to provide hands-on experience needed for basic concepts and

## Electrical Engineering

laboratory techniques of optical fiber technology. Students are billed a materials fee. Prerequisite(s): Physics 5L-M-N, or 6L-M-N; concurrent enrollment in course 130. Enrollment limited to 30. A. Yanik

### **135. Electromagnetic Fields and Waves. W**

Vector analysis. Electrostatic fields. Magnetostatic fields. Time-varying fields and Maxwell's equations. Plane waves. Prerequisite(s): course 101/L; Mathematics 23B; and Mathematics 24 or Applied Mathematics and Statistics 20 or 20A. Students must concurrently enroll in course 135L. A. Yanik

### **135L. Electromagnetic Fields and Waves Laboratory (2 credits). W**

Laboratory sequence illustrating topics in course 135. One two-hour laboratory session per week. Students are billed a materials fee. Prerequisite(s): course 101/L; Mathematics 23B; and Mathematics 24 or Applied Mathematics and Statistics 20 or 20A. Students must concurrently enroll in course 135. A. Yanik

### **136. Engineering Electromagnetics. S**

Course will cover electromagnetic wave propagation, transmission lines, waveguides, and antennas. Prerequisite(s): course 135/L. Enrollment restricted to School of Engineering and Division of Physical and Biological Sciences majors or permission of instructor. N. Kobayashi

### **145. Properties of Materials. F**

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.

Prerequisite(s): Physics 5A/L, 5B/M, and 5C/N or 6A/L, 6B/M, and 6C/N. Students must also concurrently enroll in course 145L. H. Schmidt

### **145L. Properties of Materials Laboratory (2 credits). F**

Laboratory sequence illustrating topics covered in course 145. One two-hour laboratory per week. Students are billed a materials fee. Prerequisite(s): Physics 5A/L, 5B/M, and 5C/N or 6A/L, 6B/M, and 6C/N. Students must also concurrently enroll in course 145. H. Schmidt

### **151. Communications Systems. W**

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. Prerequisite(s): courses 103, 101/L, and Computer Engineering 107 or probability theory and random variables background. Enrollment restricted to School of Engineering and Division of Physical and Biological Sciences majors or permission of instructor. H. Sadjadpour

### **152. Introduction to Wireless Communications. W**

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. Prerequisite(s): Computer Engineering 107 and course 151, or by consent of instructor. Enrollment restricted to juniors and seniors. B. Friedlander

### **153. Digital Signal Processing. S**

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. (Also offered as Computer Engineering 153. Students cannot receive credit for both courses.) Prerequisite(s): course 103. Enrollment restricted to School of Engineering and Division of Physical and Biological Sciences majors or permission of instructor. A. Fletcher

### **154. Feedback Control Systems. F**

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. (Also offered as Computer Engineering 141. Students cannot receive credit for both courses.) Prerequisite(s):

## Electrical Engineering

course 103. Enrollment restricted to School of Engineering and Division of Physical and Biological Sciences majors, or by permission of instructor. Enrollment limited to 30. D. Milutinovic, The Staff

**157. RF Hardware Design. W**  
Engineering design cycle for wireless and RF systems: design, practical hardware implementation, and prototype. Prerequisite(s): courses 101/L, 103, and 171, and Computer Engineering 174; or consent of instructor. Concurrent enrollment in course 157L is required. Enrollment limited to 30. S. Petersen

**157L. RF Hardware Design Laboratory (2 credits). W**  
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. Prerequisite(s): courses 101/L, 103, 171, and Computer Engineering 174; or consent of instructor. Concurrent enrollment in course 157 is required. Enrollment limited to 30. S. Petersen

**171. Analog Electronics. S**  
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. Prerequisite(s): course 101/L; previous or concurrent enrollment in course 171L required. The Staff

**171L. Analog Electronics Laboratory (2 credits). S**  
Laboratory sequence illustrating topics covered in course 171. One two-hour laboratory session per week. Students are billed a materials fee. Prerequisite(s): courses 101/L; previous or concurrent enrollment in course 171 required. The Staff

**172. Advanced Analog Circuits. F**  
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. Prerequisite(s): course 171. K. Pedrotti

**173. High-Speed Digital Design. S**  
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, transmission lines, ground planes and grounding, terminations, power systems, connectors/ribbon cables, clock distribution, shielding, electromagnetic compatibility and noise suppression, and bus architectures. (Formerly Computer Engineering 173.) Prerequisite(s): courses 101/L and 174. Previous or concurrent enrollment in course 173L required. Course 171 and

Computer Engineering 121 recommended. Enrollment limited to 30. S. Petersen

**173L. High-Speed Digital Design Laboratory (2 credits). S**  
Laboratory sequence illustrating topics covered in course 173. One two-hour laboratory session per week. Students are billed a materials fee. (Formerly Computer Engineering 173L.) Prerequisite(s): courses 101/L and 174. Previous or concurrent enrollment in course 173 required. Course 171 and Computer Engineering 121 recommended. Enrollment limited to 30. S. Petersen

**174. Introduction to EDA Tools for PCB Design (3 credits). F**  
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. (Formerly Computer Engineering 174.) Prerequisite(s): course 101/L or consent of instructor. S. Petersen

**175. Energy Generation and Control. F**  
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). Prerequisite(s): course 101. Concurrent enrollment in course 175L required. J. Vesecky

**175L. Energy Generation and Control Laboratory (2 credits). F**  
Computer analysis and simulation of energy generation, components, power-flow analysis, systems, and control covering topics from course 195. Weekly computer simulations

## Electrical Engineering

reinforce the concepts introduced in course 175. Students are billed a materials fee. Prerequisite(s): course 101. Concurrent enrollment in course 175 required. J. Vesecky

### **176. Energy Conservation and Control. W**

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. Prerequisite(s): courses 103 and 171. Concurrent enrollment in course 176L is required. S. Petersen, The Staff

### **176L. Energy Conversion and Control Laboratory (2 credits). W**

Simulink-based simulations of electric machines/drives in applications such as energy conservation and motion control in robotics and electric vehicles. Students are billed a materials fee. Prerequisite(s): courses 103 and 171. Concurrent enrollment in course 176 is required. S. Petersen, The Staff

### **177. Power Electronics. S**

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. Prerequisite(s): course 103. Concurrent enrollment in course 177L is required. The Staff

### **177L. Power Electronics Laboratory (2 credits). S**

Buck, boost, buck-boost, flyback, and forward converter design and control. Students are billed a materials fee. Prerequisite(s):

course 103. Concurrent enrollment in course 177 is required. The Staff

### **178. Device Electronics. W**

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. Prerequisite(s): courses 145/L and 171/L. Enrollment restricted to School of Engineering and Division of Physical and Biological Sciences majors or permission of instructor. N. Kobayashi

### **180J. Advanced Renewable Energy Sources. S**

Provides a comprehensive overview of renewable energy sources. Fundamental energy-conversion limits based on physics and existing material properties discussed. Various sources and devices, such as solar, wind, hydropower, geothermal, and fuel cells described. Solar- and wind-site assessment, as well as biofuel energy balance, also discussed. Key scientific and economic roadblocks for large-scale implementation examined. Finally, the latest research on application of nanotechnology to energy conversion and storage introduced. Taught in conjunction with course 80J. Prerequisite(s): Mathematics 3 or Applied Mathematics and Statistics 3, 5 or 7. Enrollment limited to 30. (General Education Code(s): PE-E.) M. Isaacson

### **183. Special Topics in Electrical Engineering. \***

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. May be repeated for credit. The Staff

### **193. Field Study. F,W,S**

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. The Staff

### **193F. Field Study (2 credits). F,W,S**

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. The Staff

### **195. Senior Thesis Research. F,W,S**

Individual directed study for upper-division undergraduates. Students submit petition to sponsoring agency. If using this course to replace the capstone design requirement (courses 123A and 123B), students must take course 157 or Computer Engineering 118 to fulfill the ABET team design experience. May be repeated for credit. The Staff

**195F. Senior Thesis Research (2 credits). F,W,S**

Prerequisite(s): petition on file with sponsoring agency. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**198. Individual Study or Research. F,W,S**

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. May be repeated for credit. The Staff

**198F. Independent Field Study (2 credits). F,W,S**

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. May be repeated for credit. The Staff

**199. Tutorial. F,W,S**

Individual directed study for upper-division undergraduates. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S**

Individual directed study for upper-division undergraduates. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**GRADUATE COURSES**

**200. Research and Teaching in Electrical Engineering (3 credits).**

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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. Enrollment restricted to graduate students. The Staff

**211. Introduction to Nanotechnology. W**

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. Prerequisite(s): course 145 or consent of instructor. Enrollment limited to 35. H. Schmidt

**212. Introduction to BioMEMS. S**

Oriented to general engineering and science students. Topics included are: 1) microfabrication of silicon, glass, and polymer materials; 2) microfluidics and electrokinetics; 3) sensors, actuators, and drug-delivery systems; 4) micro total-analysis systems and lab-on-a-chip devices; 5) detection and measuring systems; 6) genomics, proteomics, DNA, and protein microarrays; 7) emerging applications in medicine, research, and homeland security; 8) packaging, power systems, data communication, and RF safety; and 9) biocompatibility and standards. Recommended for advanced undergraduates and graduate students in bioengineering, electrical engineering, chemistry, and health-related fields including biochemistry, molecular and cellular biology, physiology, and genetics. Enrollment restricted to graduate students, or by permission of the instructor. J. Kubby

**213. Nanocharacterization of Materials. W**

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. Enrollment restricted to graduate students, or to undergraduates majoring in engineering or science by permission of instructor. M. Isaacson

**215. Micro-Electro-Mechanical Systems (MEMS) Design. \***

Introduction to MEMS technology: covers basic microfabrication technologies, the governing physics for MEMS devices in different energy domains (mechanical, electrical, optical, thermal, and fluidic). Fabrication and design of MEMS devices illustrated using examples of existing research prototypes and commercial products. Students design, lay out, and fabricate an optical MEMS deformable mirror device for applications in adaptive optics. Students are billed a materials fee. Prerequisite(s): courses 135, 145, and 211; and Physics 5A, 5B, and 5C. Enrollment restricted to seniors and graduate students. May be repeated for credit. J. Kubby

**216. Nanomaterials and Nanometer-Scale Devices. W**

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. N. Kobayashi

**218. Fundamentals of Nanoelectronics. S**

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. Prerequisite(s): course 211 or 216. Enrollment restricted to graduate students. Students with background in basic matrix algebra and MATLAB programming may enroll with permission of instructor. A. Yanik

**221. Advanced Analog Integrated Circuits. F**

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 course 172. Prerequisite(s): course 171 or equivalent; course 178 or equivalent recommended. Enrollment limited to 20. K. Pedrotti

**222. High-Speed Low-Power Integrated Circuit Design. \***

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 restricted to electrical engineering and computer engineering graduate students. Enrollment limited to 20. May be repeated for credit. The Staff

**223. Advanced Solid-State Devices. \***

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. The Staff

**224. Physical Design of Micro- and Opto-Electronic Packages. \***

Micro- and opto-electronic packaging and materials; mechanical properties and behavior, thermal stress in dissimilar materials, and predictive modeling. Design for reliability, dynamic response to shocks and vibrations; reliability evaluations and testing; plastic packages of IC devices; photonics packages, fiber optics structures, and new frontiers. Enrollment restricted to graduate students. The Staff

**225. Basics of Electronics Reliability. \***

Basic concepts of reliability engineering taught in application to microelectronic and photonic materials, assemblies, and packages and systems. Emphasis on the physics and mechanics of failure

physical design for reliability predictive modeling and accelerated testing, with numerous practical examples and illustrations. Prerequisite(s): basic calculus; electronic and photonic devices and systems. Enrollment restricted to graduate students. The Staff

**226. CMOS Radio Frequency Integrated Circuit Design. \***

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. Prerequisite(s): course 172 or 221 or permission of instructor. The Staff

**227. Fundamentals of Semiconductor Physics. F**

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. Enrollment restricted to graduate students. T. Yamada

**230. Optical Fiber Communication. F**

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,

## Electrical Engineering

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 course 130. Enrollment restricted to graduate students. May be repeated for credit. A. Yanik

### **231. Optical Electronics. \***

Introduction to phenomena, devices, and applications of optoelectronics. Main emphasis is on optical properties of semiconductors and semiconductor lasers. Prerequisite(s): course 145/L. May be repeated for credit. H. Schmidt

### **232. Quantum Electronics. S**

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. Prerequisite(s): course 231 or equivalent. T. Yamada

### **233. Fiber Optics and Integrated Optics. \***

Concepts and analysis of optical wave propagation in optical fibers and waveguides. Topics include geometrical optics description and electromagnetic theory of slab waveguides; modes, dispersion, and birefringence in optical fibers; mode coupling and gratings in fibers; wavelength-division multiplexing; nonlinear optics in fibers and solitons; semiconductor optical amplifiers and Er doped fiber amplifiers. Prerequisite(s): courses 135 and 145. The Staff

### **234. Liquid Crystal Displays. \***

Introduction to principle of operation, components and systems of liquid crystal displays (LCDs).

Topics include basic LCD components, properties of liquid crystals, polarization of optical waves, optical wave propagation in anisotropic media, Jones matrix method, various display systems, active matrix addressing, and color LCDs. Prerequisite(s): course 135 and 136. Enrollment restricted to seniors and graduate students. The Staff

### **235. Optical Information Storage and Processing. \***

Introduction to applications of optical technologies in data storage and information processing. Topics include basic principles of Fourier optics; electro-optic, acousto-optic, and magneto-optic effects and devices; planar and volume holography; optical data storage systems; and optical information processing, interconnecting, and switching systems. Enrollment restricted to graduate students, or undergraduates having completed Physics 5B and 5C and course 103. The Staff

### **236. Integrated Biophotonics.**

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. Prerequisite(s): course 233 or equivalent. Enrollment restricted to graduate students. Enrollment limited to 20. H. Schmidt

### **241. Introduction to Feedback Control Systems. F**

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 Electrical Engineering 154. (Also offered as Computer Engineering 241. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. D. Milutinovic, The Staff

### **250. Digital Signal Processing. S**

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. A. Fletcher

### **251. Principles of Digital Communications. \***

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. Prerequisite(s): course 151 and 153 (or Computer Engineering 153) and Computer Engineering 107. The Staff

### **252. Wireless Communications. W**

In-depth study of the physical layer of wireless communications. Wireless propagation channels and their impact on digital communications. Modulation

## Electrical Engineering

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.

Prerequisite(s): course 251. B. Friedlander

### **253. Introduction to Information Theory. F**

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. (Also offered as Computer Science 250. Students cannot receive credit for both courses.) Prerequisite(s): Computer Engineering 107, or Applied Mathematics and Statistics 131 or equivalent course, or permission of instructor. H. Sadjadpour

### **254. Multi-User Information Theory. \***

Topics include basic information theory, multiple-access channel, broadcast channel, interference channel, relay channel, capacity with feedback, capacity of networks, and channels with state and current research.

Prerequisite(s): course 253.

Enrollment restricted to graduate students. The Staff

### **255. Multiple-Antenna Wireless Communications. \***

Basic theory of multiple-antenna wireless systems. Introduction to space-time propagation models, capacity of multiple-input multiple-output (MIMO) channels, space-time coding, transmitter CSI, and multiuser space-time systems. Includes discussion of multiple antennas in emerging systems and

standards. Prerequisite(s): course 252 and Computer Engineering 107, or Applied Mathematics and Statistics 131, or equivalent. The Staff

### **256. Introduction to Radar Systems and SAR. \***

Fundamentals of radar systems and radar-signaling processing, including SAR. Emphasizes real-world applications. MATLAB emphasizes algorithm development and performance analysis. Basic EM theory and a first course in signal processing are recommended. Enrollment limited to 20. The Staff

### **261. Error Control Coding. S**

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. H. Sadjadpour

### **262. Statistical Signal Processing. W**

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 Statistical Signal Processing I.) Prerequisite(s): course 103 and

Computer Engineering 107, or permission of instructor. A. Fletcher

### **263. Advanced Topics in Coding Theory. \***

Covers convolutional codes and its principles, maximum likelihood decoding and Viterbi decoding, performance evaluation of convolutional codes, trellis coded modulation (TCM), rotationally invariant convolutional codes, turbo codes, turbo decoding principles, performance evaluation of turbo codes, interleaver design for turbo codes, topics on turbo codes, space-time codes, and LDPC.

Prerequisite(s): course 261.

Enrollment restricted to electrical engineering, computer engineering, and computer science graduate students. Enrollment limited to 10. The Staff

### **264. Image Processing and Reconstruction. \***

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. Students that have completed Computer Engineering 261 may not take this course for credit. Prerequisite(s): course 153 or permission of instructor. The Staff

### **265. Introduction to Inverse Problems (3 credits). F**

Fundamental approaches and techniques in solving inverse problems in engineering and applied sciences, particularly in imaging. Initial emphasis on fundamental mathematical,

## Electrical Engineering

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). Enrollment restricted to graduate students. The Staff

### **270. Neural Implant Engineering.** \*

Advanced studies of the basic neuroscience-engineering design requirements and technological issues associated with implantable neural prostheses, with particular emphasis on retinal and cortical function. Course is team-taught via remote web cast. A basic understanding of physics, circuit theory, and electronics is required. Enrollment restricted to graduate students; juniors and seniors may enroll by permission of instructor. The Staff

### **280B. Seminar on Integrated Bioelectronics (2 credits).** \*

Weekly seminar covering current research in integrated bioelectronics. May be repeated for credit. The Staff

### **280I. Seminar on Microscopy and Nanotechnology (1 credit).** \*

Weekly seminar series covering research topics and experimental research in microscopy and nanotechnology. Current research and literature are discussed. Students lead discussion and participate in all meetings. Enrollment restricted to graduate students. Enrollment by permission of instructor. Enrollment limited to 10. May be repeated for credit. The Staff

### **280M. Seminar on Micro-Electro-Mechanical Systems (MEMS) (2 credits).** F,W,S

Weekly seminar series covering topics of current research interest

in Micro-Electro-Mechanical Systems (MEMS) design, fabrication and applications. Current research work and literature in these areas are discussed. Enrollment restricted to graduate students.

Undergraduates may enroll with permission of instructor. May be repeated for credit. J. Kubby

### **280O. Seminar on Applied Optics (2 credits).** F,W,S

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. May be repeated for credit. H. Schmidt

### **280Q. Seminar on Quantum Electronics and Nanoelectronics (2 credits).** \*

Weekly series covers current research in quantum electronics including electron and photon transport in nanostructures; nanoscale heat transport; optoelectronic integrated circuits; nanoscale devices for energy conversion; micro-refrigeration; thermal and acoustic imaging of nanostructures. Current research work and recent literature are discussed. Enrollment restricted to graduate students; undergraduates may enroll by permission of instructor. May be repeated for credit. The Staff

### **281. Guest Seminar Series (1 credit).** \*

Distinguished speakers from industry, universities, and government discuss current developments in electrical engineering and related fields. Emphasis on research questions that may lead to collaborative work with faculty and graduate students. Enrollment restricted to graduate

students. May be repeated for credit. The Staff

### **283. Special Topics in Electrical Engineering (3 credits).** S

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 restricted to graduate students and consent of instructor. Enrollment limited to 25. May be repeated for credit. F. Dowla

### **289. Adaptive Optics for Biological Imaging.**

Covers principles, methods and applications of adaptive optics in biological imaging. Focuses on the emerging application of adaptive optics in biological microscopy (wide-field, confocal, and multi-photon) for correction of wavefront aberrations caused by light propagation through biological samples. J. Kubby

### **290. EE Graduate Seminar (1 credit).** \*

Research seminar at the graduate level regarding technical areas of electrical engineering activity that are of interest to the research and/or commercial communities. Enrollment restricted to computer engineering, electrical engineering, or physics graduate students, or by permission of instructor. Enrollment limited to 30. May be repeated for credit. The Staff

### **291. Tomorrow's Professor: Preparing for an Academic Career in Science and Engineering (3 credits).** \*

The aim of this course is two-fold: (1) inform, motivate, and prepare graduate students for a possible

## Electrical Engineering

career in academia; (2) expose both undergraduate and graduate students to the academic enterprise, possible career options for those who pursue advanced degrees in engineering and science. The Staff

### **293. Advanced Topics in Electrical Engineering. F,S**

Graduate seminar course 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): Consent of instructor. Enrollment restricted to graduate students. Enrollment limited to 25. May be repeated for credit. N. Kobayashi, A. Fletcher, M. Oye

### **296. Master Project. F,W,S**

Master project conducted under faculty supervision. Petition on file with sponsor faculty. The Staff

### **297. Independent Study or Research. F,W,S**

Independent study or research under faculty supervision. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **299. Thesis Research. F,W,S**

Thesis research conducted under faculty supervision. Students submit petition to sponsoring agency. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# TECHNOLOGY MANAGEMENT

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2015-16 General Catalog

Baskin School of Engineering

(831) 459-2158

<http://www.soe.ucsc.edu>

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## PROGRAM DESCRIPTION

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Technology and Information Management (TIM) is a multi-disciplinary program that focuses on the integration of engineering, computer science, information technology, and business management 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 of new-product development and entrepreneurship.

The program offers a bachelor of science (B.S.) degree as well as a minor. At the graduate level, it offers a professional masters of science in TIM and a Ph.D. in TIM.

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 23-24 required courses (with four laboratories, totaling 120-123 quarter credits) plus four elective courses (20 quarter credits) for the technology and information

management major program. To plan for completion of these course requirements within the normative time, students should consult with an adviser as early as possible. Honors students are likely to find the rigorous management and leadership elements of the new program of significant interest. Industrial interactions and projects are key features of this major.

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## PROGRAM LEARNING OUTCOMES

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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.

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## TECHNOLOGY AND INFORMATION MANAGEMENT POLICIES

### ADMISSIONS POLICY

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Admission to the technology and information management major is selective. First-year applicants may receive direct admission at the time they apply to UCSC based on their high school record and test scores. To be admitted to the major after a student has entered UCSC, students need to complete a total of six courses chosen from the following:

At least one course chosen from the following list of mathematics courses:

- MATH 19A or MATH 20A
- MATH 19B or MATH 20B

## Technology Management

- MATH 22 or 23A
- CMPE 16

At least one course chosen from the following list of engineering courses:

- CMPS 12A/L, or CMPS 5J and CMPS 11, or CMPE 13/L
- CMPS 12B/M
- CMPE 12/L

At least one course chosen from the following list of economics and technology and information management courses:

- ECON 1
- ECON 2
- ECON 10A
- TIM 50

At least three additional courses must be chosen from the following:

- CMPS 12A/L (or CMPS 5J and CMPS 11) or CMPE 13/L
- CMPS 12B/M
- CMPE 12/L
- CMPE 16
- ECON 1
- ECON 2
- ECON 10A
- MATH 19A or 20A
- MATH 19B or 20B
- MATH 22 or 23A
- TIM 50

In addition, students who have passed six qualifying courses and who have received more than one grade of NP, C-, D+, D, D-, or F in the qualifying courses are not eligible to declare the major.

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.

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### LETTER GRADE POLICY

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Please refer to the letter grade policy in the School of Engineering section.

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### TRANSFER STUDENTS

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It is recommended that transfer students have six transferable courses completed from the list used above for on-campus students.

Admission of transfer students will be based on performance in all courses transferable to the Technology and Information Management major.

Students should consult [assist.org](http://assist.org) to determine which courses at other institutions in California are transferable to UCSC.

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### SCHOOL OF ENGINEERING POLICIES

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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 UCSC students to obtain pre-approval before taking courses elsewhere.

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### PREPARATION FOR THE MAJOR

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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.

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### REQUIREMENTS OF THE TECHNOLOGY AND INFORMATION MANAGEMENT MAJOR

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In addition to completing UCSC general education requirements, students must complete 23 required courses (with four laboratories, totaling 120-123 quarter credits) plus four elective courses (20 quarter credits) for the technology and information management major program. To plan for completion of these course requirements within the normative time, students should consult with a School of Engineering adviser as early as possible. These 27-28 courses include the following:

**REQUIRED COURSES (23-24 COURSES PLUS FOUR LABORATORIES)**

**APPLIED MATHEMATICS AND STATISTICS (ONE 5-CREDIT COURSE)**

Applied Mathematics and Statistics 5, Statistics MATHEMATICS (FIVE 5-CREDIT COURSES)

19A-B, Calculus for Science, Engineering, and Mathematics; and

22, Introduction to Calculus of Several Variables; or 23A, Multivariable Calculus, and

Applied Mathematics and Statistics 10 and 20, Mathematical Methods for Engineers I and II;

or Applied Mathematics and Statistics 10A and 20A, Basic Mathematical Methods for Engineers I and II (3 credits each); or Mathematics 21, Linear Algebra and Mathematics 24, Ordinary Differential Equations

**Economics (five 5-credit courses)**

1 Introductory Microeconomics: Resource Allocation and Market Structure

2 Introductory Macroeconomics: Aggregate Economic Activity

10A, Economics of Accounting

100A, Intermediate Microeconomics; or

100M, Intermediate Microeconomics Math Intensive

113, Introduction to Econometrics

**Computer Engineering (three 5-credit courses and two 2-credit laboratories)**

12/L, Computer Systems and Assembly Language/Laboratory

16, Applied Discrete Mathematics

150/L, Introduction to Computer Networks/Laboratory

**Computer Science (three or four 5-credit courses and two 2-credit laboratories)**

12A/L, Introduction to Programming(Accelerated)/Laboratory; or 5J, Introduction to Programming in Java and 11, Intermediate Programming

12B/M, Introduction to Data Structures/Laboratory

182, Introduction to Database Management Systems

**Technology and Information Management (five 5-credit courses and one 2-credit seminar)**

50, Business Information Systems

58, Systems Analysis and Design

101, Management of Technology Seminar

105, Management of Technology I

125, Management of Technology II

158, Business Strategy and Information Systems

**Elective Courses (four courses)**

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:
  1. either Applied Mathematics and Statistics 131 or Computer Engineering 107, but not both;
  2. at most one independent or field-study course (193, 195, 198, 199) with prior approval from the department to be used as an elective.
- One 5-credit, upper-division School of Engineering or economics course (the limitations on School of Engineering electives given above apply)

**TECHNOLOGY AND INFORMATION MANAGEMENT MAJOR PLANNERS**

The following are two sample academic plans for students to complete during their first two years as preparation for the technology and information management major. Plan One is recommended for students who are more proficient in mathematics and programming and Plan Two is recommended for students who need more time to develop proficiency in mathematics and programming.

<b>Plan One</b>			
<b>Year</b>	<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
1st (frsh)	ECON 1	ECON 2	TIM 50
	MATH 19A	MATH 19B	MATH 22 or 23A
	college core		
2nd (soph)	CMPS 5J	CMPS 11	ECON 100A
	ECON 10A	CMPE 16	AMS 10

<b>Plan Two</b>			
<b>Year</b>	<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
1st (frsh)	CMPS 10	CMPS 5J	CMPS 11
	MATH 3	MATH 19A	MATH 19B
	college core		
2nd (soph)	TIM 50	CMPE 16	ECON 10A
	ECON 1	ECON 2	MATH 22 or 23A

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## DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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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 course 158.

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## COMPREHENSIVE REQUIREMENT

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Students complete two project-intensive courses, Technology and Information Management 158 and Technology and Information Management 105, which constitute the comprehensive requirement for the technology and information management major, based on the dual aspects (technology of management and management of technology) of the program. Course 158 deals with the technology of management, and course 105 deals with the management of technology. Both courses involve a substantial amount of critical thinking and writing within the context of comprehensive projects.

Technology and Information Management 158, Business Strategy and Information Systems, 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.

Technology and Information Management 105, Management of Technology I, requires that students understand and apply structured methodologies for the development, management, and commercialization of technologies and products. Students will work in teams on a comprehensive term project in the development, commercialization, and management of technologies such as computers, networks, semiconductors, mechatronics, and biotechnology.

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## HONORS

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The TIM program awards honors to students whose academic performance is excellent. Students with a GPA between 3.5 and 3.7 will be awarded honors. Students with a GPA of 3.7 receive highest honors. Students who have been found guilty of academic misconduct are not eligible for either honors or highest honors.

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## MINOR IN TECHNOLOGY AND INFORMATION MANAGEMENT (TIM)

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### PURPOSE

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There is a growing need in today's increasingly complex socio-technological world for the fusion of information systems, technology, and business management for two important purposes: the use of information systems to solve business problems, and the management of technology, which includes new product development and enterprise management. The technology and information management (TIM) program therefore offers a minor in technology and information management (TIM) to provide 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.

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### RATIONALE FOR THE COURSES

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Courses for the technology and information management minor will include a combination of courses from the TIM program, computer engineering, computer science, and economics as well as the chains of prerequisites behind these courses. The TIM program courses for the technology and information management minor will include a mix of information systems and management of technology courses, providing students with a strong foundation in both the management of information systems and the management of technology.

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### COURSE REQUIREMENTS

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Requirements for the minor in technology and information management are the following:

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#### LOWER-DIVISION REQUIREMENTS

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#### **Mathematics (2 courses)**

Mathematics 19A, Calculus (or Applied Mathematics and Statistics 11A/Economics 11A, Mathematical Methods for Economists, or Mathematics 11A, Calculus, or Mathematics 20A, Honors Calculus)

Mathematics 19B, Calculus (or Applied Mathematics and Statistics 11B/Economics 11B, Mathematical Methods for Economists, or Mathematics 11B, Calculus, or Mathematics 20B, Honors Calculus)

## Technology Management

### Computer Science (1 course)

Computer Science 5J, Introduction to Programming in Java; or Computer Science 5C, Introduction to Programming in C/C++

### Technology and Information Management (2 courses)

Technology and Information Management 50, Business Information Systems; and

One of the following courses:

- Technology and Information Management 58, Systems Analysis and Design; or
- Technology and Information Management 80C, Starting a New Technology Company

### UPPER-DIVISION REQUIREMENTS

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#### Mathematics (1 course)

One of the following courses:

- Economics 113, Introduction to Econometrics; or
- Computer Engineering 107, Probability and Statistics for Engineers; or
- Applied Mathematics and Statistics 131, Introduction to Probability Theory

### UPPER-DIVISION ELECTIVES (4 COURSES)

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Four upper -division courses selected from the following:

- Technology and Information Management 105, Management of Technology I
- Technology and Information Management 125, Management of Technology II
- Technology and Information Management 158, Business Strategy and Information Systems
- Computer Engineering 150/L, Introduction to Computer Networks/Laboratory
- Computer Science 180, Database Systems I or Computer Science 182, Introduction to Database Management Systems
- Economics 100A, Intermediate Microeconomics or 100M, Intermediate Microeconomics, Mathematics Intensive
- Economics 100B, Intermediate Macroeconomics or 100N, Intermediate Macroeconomics, Mathematics Intensive

With pre-approval from the technology and information management undergraduate director, up to two graduate technology and information management courses may be used to satisfy upper-division elective requirements.

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## GRADUATE PROGRAMS

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### TECHNOLOGY AND INFORMATION MANAGEMENT PH.D. AND MASTER'S DEGREES

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Technology and information management (TIM) is a new and distinct discipline within engineering, combining technology management, systems engineering, and information technology. TIM's research and academic programs, combining information technology with both knowledge management and systems management, address problems facing firms today as they deal with more complex decisions in a global environment, facing new business models (e.g., "services") and business practices. TIM places special emphasis on research arising from challenges faced in creation and management of knowledge-based services and enterprises. TIM themes include:

**Management and optimization of enterprise systems**, which is the integration of business, technology, and management perspectives to enable an entity to achieve enhanced growth and profitability through use of analytical methods including stochastic models, optimization, game theory and knowledge management.

**New product, technology, and services management**, which is the design and development of products and services, the design and risk management of product portfolios, and pricing.

**Financial engineering**, which addresses the management of risk, reward, and allocation of resources in technology development and deployment.

**Information retrieval and knowledge management**, which includes semantic mining and machine learning, linking business to knowledge management.

TIM offers a master of science (M.S.) degree as a terminal degree for engineers who wish to prepare for careers in management in high-tech enterprises, providing the appropriate breadth and depth of courses for preparation of these engineering managers.

The TIM doctor of philosophy (Ph.D.) degree focuses on research, with emphasis on analytic methods for managing high-tech enterprises, including product, services, and business-process innovation and development; financial engineering for technology and enterprise management; entrepreneurship; operations and supply-chain management; costing and strategy; marketing engineering; data mining; and the applications of information technology to knowledge-management.

## BASE REQUIREMENT

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Most entering students are expected to come from undergraduate engineering programs. Students with quantitative undergraduate preparation in the sciences, economics, or mathematics would also be prepared if they had significant industry experience in a technology field or if they are prepared to take extra courses and/or an internship in industry to obtain this background. The TIM M.S. attracts students now employed in industry and also recent B.S. graduates who have not yet entered the workforce. For this latter group, industrial experience will be encouraged through internships with local companies. TIM M.S. students may take up to two upper-division, undergraduate, prerequisite courses and, with adviser approval, may count these as credit toward the M.S. degree. (These courses will not count as credit toward the Ph.D. degree.)

### Mathematics

Probability and statistics (AMS 131)—Focus on probability models, random variables, maximum likelihood and Bayesian estimation

Linear algebra (AMS 10 or MATH 21)

Differential equations (AMS 10 or MATH 24)

### Computer Science

Abstract Data Types (CMPS 101)—Focus on abstract data types and common algorithms

Programming project (e.g., CMPS 104A, CMPS 115, CMPS 111)—Any upper-division, computer science course that involves a large programming project

Database systems (CMPS 180, 181)

### Computer Engineering

Probability and Statistics for Engineers (CMPE 107)

Computer networks (CMPE 150, 151)

Computer Architecture (CMPE 110)

Applied Graph Theory and Algorithms (CMPE 177)

### Economics

Microeconomics (ECON 100A)

Macroeconomics (ECON 100 B)

Managerial Economics (ECON 101)—Includes pricing schemes, non-price competition, and game theory

## FIELD EXAMINATIONS AND/OR OTHER PRE-QUALIFYING EXAMINATIONS

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The graduate record examination (GRE) General Test is required for admission and a GRE subject advanced test—preferably in computer science, engineering, physics, or mathematics—is highly recommended. Chemistry and biology students with adequate training

in mathematics and physics may also be considered. Student GPA of 3.5 or higher is recommended for admission into the program.

## RELATIONSHIP OF MASTER'S AND DOCTOR'S PROGRAMS

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The M.S. and Ph.D. programs have the same admission requirements. As in other SOE graduate programs, students admitted to the M.S. program may be subsequently admitted to the Ph.D. program by departmental approval. Ph.D. students may receive the M.S. degree upon fulfillment of the M.S. degree requirements.

## MASTER'S REQUIREMENTS

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Masters students must complete a minimum of 45 credits, comprised of the following:

### Core Courses (4 required)

- TIM 204, Introduction to Optimization in Business (5 credits)
- TIM 205, Management of Technology I (5 credits)
- TIM 215, Organizations and Leadership (5 credits)
- TIM 245, Data Mining (5 credits)

With appropriate preparation and/or student interest, proposals will be accepted to allow substitution of another graduate course for one of the core courses. This proposal will require approval of the faculty adviser and the TIM graduate director.

### Seminars (2 required)

- Two TIM graduate seminars (5 credits total)

### Other Courses (15 credits minimum)

- A minimum of fifteen credits (three courses) must be from graduate elective courses approved by the adviser and the TIM graduate director. The program offers a wide variety of electives.
- One upper-division undergraduate course can be substituted for one of the three required graduate courses with the approval of the adviser and TIM graduate director.
- When necessary to strengthen students' preparation for graduate study, up to two additional upper-division undergraduate courses may be required by agreement of the adviser and TIM graduate director.
- Students serving as teaching assistants or who plan to pursue a Ph.D. must take Applied Mathematics and Statistics 200, Research and Teaching in AMS (3 credits), or Computer Science 200, Research and Teaching in Computer Science and Engineering (3 credits) before or during their first teaching-assistant (TA) assignment.

### **TIM Master's Project**

TIM 297. This is a substantial applied research project carried out independently by the student under the guidance of a faculty member. The topic and completed project must be approved by the faculty adviser (5 credits).

### **PH.D. REQUIREMENTS**

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The research areas in TIM are varied, and each will require a different sequence of classes to develop appropriate depth in analytical methods and technology. The selection of graduate courses will be in consultation with the dissertation supervisor.

Although there is no teaching requirement, students will be encouraged to gain teaching experience by becoming teaching assistants (TAs).

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.

#### **Ph.D. students must complete a minimum of 62 credits, comprised of the following:**

Four TIM core courses (same as TIM-MS Core). Up to two of these courses may be substituted with other 5-credit courses with approval of the faculty advisor and reported to the graduate director (20 credits);

Two TIM seminars (4 credits minimum);

Two elective graduate courses (10 credits) offered by TIM;

Three additional graduate electives (15 credits) chosen with approval of the adviser and TIM graduate director. Students may substitute other appropriate courses for the TIM core courses or electives with the approval of their adviser and TIM graduate director;

A minimum of 10 credits of dissertation research or independent study;

Applied Mathematics and Statistics 200, Research and Teaching in AMS (3 credits); or Computer Science 200,

Research and Teaching in Computer Science and Engineering (3 credits)

### **Ph.D. Qualifying Examination and Dissertation**

Each student writes a Ph.D. dissertation. The dissertation must show the results of in-depth research, be an original contribution of significant knowledge, and include material worthy of publication. As the first step, a student submits a written dissertation proposal to a TIM faculty member. By accepting the proposal, the faculty member becomes the dissertation supervisor. The dissertation proposal is formally presented in an oral qualifying examination given by a qualifying examination committee approved by the graduate committee and the graduate division. The student must submit his or her written dissertation proposal to all members of the committee and the graduate assistant one month in advance of the examination.

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 have paid the advancement fee. Students who have not advanced to candidacy by the end of their fourth year will be placed on academic probation.

The appointment of the dissertation reading committee is made immediately after the qualifying examination and is necessary for advancing to candidacy. Each Ph.D. candidate submits the completed dissertation to a reading committee at least one month prior to the dissertation defense. 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 and attending faculty, 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.

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## TECHNOLOGY MANAGEMENT FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**Ramakrishna Akella**

Data analytics: machine learning; informational retrieval (search); data; text; image and video mining; social networks and recommender systems; business analytics: business and management of technology; intelligent services and knowledge management, IT; product design; delivery and portfolios; financial engineering and management; process learning; supply chain management; automation

**J.J. Garcia-Luna Aceves (joint with Computer Engineering)**

Jack Baskin Chair of Computer Engineering  
Principles of computer communication, Internet, mobile and pervasive computing, wireless networks, information centric networks, network science

**Daniel Friedman (joint with Economics)**

Microeconomic theory, experimental/behavioral economics, evolution and learning, financial markets

**Brent Haddad (joint with Environmental Studies)**

Fresh-water economics, policy, and communications; economic institutions and the environment; climate-change mitigation and adaptation; institutional and ecological economics

**Patrick Mantey (joint with Computer Engineering)**

**Jack Baskin Chair of Computer Engineering**  
Multimedia systems, digital signal processing, sensor systems and networks, real-time monitoring and control, image systems, image processing, visualization, geographic information systems, decision support systems

### ASSOCIATE PROFESSOR

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**Yihsu Chen**

Economics and policy in energy, water resources and transportation sectors

**John Musacchio**

Control, analysis, and pricing of communications networks; applications of game theory in networking; wireless ad-hoc networks; and management of technology

**Yi Zhang**

Large-scale information retrieval, recommendation systems, internet advertising, data mining, natural language processing, applied machine learning

### SENIOR LECTURER WITH SECURITY OF EMPLOYMENT

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**Subhas Desa**

Management of technology, new product development, supply-chain management, knowledge engineering, system dynamics and control

**Luca De Alfaro (Computer Science)**

Reputation systems, crowdsourcing, game theory; formal methods

**William B. Dunbar (Computer Engineering)**

Theory and application of feedback control, single-molecule biophysics, nanopore sensors, dynamics and control of biomolecules

**Michael Isaacson (Electrical Engineering)**

Nano- and microfabrication technology and applications to biomedical and diagnostic devices, nanocharacterization of materials with emphasis on the development of microscopy tools, novel modes of imaging, electron and light optics, renewable energy systems, STEM education

**Robert A. Levinson, Emeritus (Computer Science)****Darrell Long (Computer Science)**

Kumar Malavalli Endowed Chair in Storage Systems  
Data storage systems, distributed computing, operating systems, performance evaluation, reliability, cyber security, data science, multimedia

**Charles E. McDowell (Computer Science)**

Programming languages, parallel computing, and computer science education

**Alex Pang (Computer Science)**

Uncertainty visualization, tensor visualization, scientific visualization, comparative visualization, collaboration software, virtual reality interfaces

**Ira Pohl, Emeritus (Computer Science)****Nirvikar Singh (Economics)**

Industrial organization, political economy, economic development, technology and innovation, South Asian immigrants in the U.S.

**Linda Werner (Computer Science)**

Software engineering, computer science education, children and computer game creation, testing, increasing diversity in computer science

**James Whitehead, Jr. (Computational Media)**  
Software engineering, software evolution, software bug

prediction, level design in computer games, procedural content generation

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## TECHNOLOGY MANAGEMENT COURSES

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### LOWER-DIVISION COURSES

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**20. Innovations and Entrepreneurship Seminar (2 credits). F,W,S**

Helps students convert their ideas into a viable business. Students must provide their own idea for a new product or company. Local entrepreneurs provide advice and mentoring to each student team. Enrollment limited to 50. (General Education Code(s): PR-E.) B. Haddad

**21. Innovations and Entrepreneurship in Practice.**

The second of a two-part series in basic entrepreneurship, This course helps student entrepreneurs test and validate a marketing and customer business model for a new idea, and refine a working prototype or service. Prerequisite(s): course 20 or course 105 or by consent of the instructor. (General Education Code(s): PR-E.) J. Skardon

**50. Business Information Systems. F,W,S**

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. R. Akella, Y. Chen, J. Musacchio

**58. Systems Analysis and Design. W**

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. Prerequisite(s): course 50. Enrollment limited to 40. R. Akella

**80C. Starting a New Technology Company. S**

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. (General Education Code(s): T7-Natural Sciences or Social Sciences.) S. Desa, The Staff

**94. Group Tutorial. F,W,S**

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. May be repeated for credit. The Staff

**94F. Group Tutorial (2 credits). F,W,S**

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. May be repeated for credit. The Staff

**99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**99F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### UPPER-DIVISION COURSES

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**101. Management of Technology Seminar (2 credits). F,W,S**

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. May be repeated for credit. S. Desa

**105. Introduction to Management of Technology I. F**

An in-depth examination of technological, strategic, marketing, and financial methods and analytical tools for the management of technology to enable cost-effective and rapid development of profitable and high quality technologies. Includes case studies and a comprehensive project. (Formerly Management of Technology I.) Prerequisite(s): Mathematics 19B or 11B or Applied Mathematics and Statistics 11B or Economics 11B. S. Desa

**115. Entrepreneurial Organization and Leadership. \***

Provides a framework for analysis and practical insights into the issues associated with managing people,

## Technology Management

including motivation, team creation, and management and managing performance. Entrepreneurial leadership roles are emphasized. Enrollment restricted to juniors, seniors, and graduate students. Enrollment limited to 50. (General Education Code(s): PE-H.) The Staff

### **125. Introduction to Management of Technology II. W**

High-technology enterprises must understand and operate effectively within their technology-business value chains in order to maximize profitability. This course develops and applies methods and tools for the design, optimization, selection, and management of these value chain networks. (Formerly Management of Technology II.) Prerequisite(s): course 105. S. Desa

### **130. Financial Engineering and Management in High Technology Firms. W**

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. Prerequisite(s): Economics 113 or Applied Mathematics and Statistics 131 or Computer Engineering 107 or by instructor permission. Enrollment limited to 20. R. Akella

### **158. Business Strategy and Information Systems. S**

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. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; course 50 or permission of instructor. (General Education Code(s): W.) The Staff

### **166A. Game Theory and Applications I. F**

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. (Also offered as Computer Science 166A. Students cannot receive credit for both courses.) Prerequisite(s): Applied Math and Statistics 5 or 7 or Economics 113; and Economics 11B, Applied Math and Statistics 11B, or Mathematics 11B or 19B. Enrollment restricted to juniors and seniors. Enrollment limited to 100. J. Musacchio

### **193. Field Study. F,W,S**

Provides individual programs of study with specific academic objectives carried out under direction of faculty member of Information Systems 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. May be repeated for credit. The Staff

### **193F. Field Study (2 credits). F,W,S**

Provides individual programs of study with specific academic objectives carried out under

direction of faculty member of Information Systems 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. May be repeated for credit. The Staff  
**194. Group Tutorial. F,W,S**  
A program of independent study arranged between a group of students and a faculty member. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **194F. Group Tutorial (2 credits). F,W,S**

A program of independent study arranged between a group of students and a faculty member. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **195. Senior Thesis Research. F,W,S**

Intended for majors. Students submit petition to sponsoring agency. The Staff

### **195F. Senior Thesis Research (2 credits). F,W,S**

Intended for majors. Students submit petition to sponsoring agency. The Staff

### **198. Individual Study or Research. F,W,S**

Intended for majors. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **198F. Individual Study or Research (2 credits). F,W,S**

Intended for majors. Students submit petition to sponsoring agency. May be repeated for credit.

**199. Tutorial. F,W,S**

Individual directed study for upper-division undergraduates. Students submit petition to sponsoring agency. Enrollment restricted to senior information systems management majors. May be repeated for credit. The Staff

**GRADUATE COURSES**

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**204. Introduction to Optimization in Business. \***

Covers optimization with emphasis on problems arising in management. Students become proficient at mathematical modeling of business decisions and familiar with a range of techniques and tools used to solve optimization problems. Enrollment restricted to graduate students. The Staff

**205. Management of Technology I. F**

Addresses technological, strategic, marketing, financial methods, and analytical tools for management of technology in an integrated manner that enables the cost-effective and rapid development of profitable and high quality technologies. Includes case studies and a comprehensive project. Enrollment restricted to juniors, seniors, and graduate students. S. Desa

**206. Optimization Theory and Applications. S**

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. Prerequisite(s): calculus and linear algebra. Enrollment restricted to graduate students. Y. Chen

**207. Random Process Models in Engineering. W**

A first graduate course in stochastic process modeling and analysis with an emphasis on applications in technology management, information systems design, and engineering. Enrollment restricted to graduate students. Prerequisite: Computer Engineering 107 or other undergraduate probability course recommended. J. Musacchio

**209. Data Mining and Business Analytics in Knowledge Services. S**

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. Enrollment restricted to graduate students. Students are expected to have undergraduate preparation in probability and statistics. Undergraduates may enroll with instructor approval. R. Akella

**210. Marketing Analytics and Engineering. \***

Provides students with a systematic methodology and the corresponding set of methods and analytical tools to address the analytic approaches to marketing in a real-world context. Trains

students in the basic elements of statistics decision trees, stochastic optimization, and other algorithmic approaches. Students should have a solid background in the following: probability equivalent to statistics, stochastic methods, calculus, linear algebra, stochastic processes and optimization, and/or mathematical maturity. Recommended courses: course 207, course 250, Applied Mathematics and Statistics 203, Applied Mathematics and Statistics 205, Computer Engineering 230. Enrollment restricted to graduate students. Enrollment by permission of instructor. The Staff

**211. E-Business Technology and Strategy. F**

Surveys structure of modern information technology, the relation of that structure to structure of the industry that creates it, and the economic forces that drive the players in the industry. Building on these technological and economic concepts, studies how firms can craft a technology and business strategy to create and capture value in the information technology product and/or services sectors. Enrollment restricted to graduate students. J. Musacchio

**215. Organizations and Leadership. \***

Addresses organizational and managerial aspects of high-tech enterprises, providing an understanding of various corporate functions. Considers issues of human resources: motivation and rewards, group dynamics, communication, ethics, and leadership. Includes perspectives from behavioral theories and corporate practice/culture. Enrollment restricted to graduate students. The Staff

**225. Management of Technology II. W**

High technology enterprises must understand and operate effectively within their technology-business value chains in order to maximize profitability. Course develops and applies methods and tools for the design, optimization, selection, and management of these value chain networks. Prerequisite(s): course 205 or consent of instructor.

Enrollment restricted to juniors, seniors, and graduate students. S. Desa

**230. Financial Engineering and Management in High Technology Firms. \***

Course provides students with a systematic methodology, and the corresponding set of methods and analytical tools, to address the field of financial engineering and its use in high-tech enterprises in an integrated manner. Covers basic concepts of stochastic optimization and other algorithmic approaches, such as stochastic dynamic programming; decision models and analysis; and binomial trees; and their application in financial engineering in the context of high-tech enterprises. Prerequisite(s): Computer Engineering 107 or Economics 113 or Applied Mathematics and Statistics 131, or instructor approval. Enrollment restricted to graduate students. R. Akella

**240. Information Technology for Decision Support: An Introduction. \***

Introduction to the information technologies useful to IT management. Reviews/surveys four major topics: 1) information systems: from computer technology—systems architecture (hardware and software), multiprocessors and cluster—to client-server, networking and

distributed computing, data storage and data servers, file management, database systems, input/output technology, graphics and multimedia; 2) IT as a "service": commercial and open-course tools for information-system development and knowledge management; 3) managing, searching, and mining of structured and unstructured data; 4) decision-support systems that integrate knowledge with data mining and text mining tools to support decision-making in product development, supply-chain management, marketing, sales and logistics. Enrollment restricted to graduate students. The Staff

**245. Data Mining. W**

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. Enrollment restricted to graduate students. The Staff

**250. Stochastic Optimization in Business Intelligence: Digital Advertising and Online Marketing. \***

Trains students in stochastic optimization and other algorithmic approaches, such as stochastic dynamic programming, to achieve business intelligence (BI) optimization. Special emphasis on digital advertising, and online and computational marketing. Students should have solid background in: probability equivalent to statistics, stochastic methods, calculus, linear algebra, mathematical maturity, stochastic processes, and optimization. First of a sequence of courses in information systems and technology management (ISTM). Provides students with systematic methodology and corresponding set of methods and analytical tools to

address the field of ISTM in an integrated manner. Enrollment restricted to graduate students; undergraduates who have completed Computer Engineering (CMPE) 107 or Applied Mathematics & Statistics (AMS) 131 may enroll by permission of instructor. AMS 205A, CMPE 230 recommended. The Staff

**251. Large-Scale Web Analytics and Machine Learning. \***

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. Prerequisite(s): Computer Engineering 107 or Applied Mathematics and Statistics 131 or permission of instructor. Enrollment restricted to graduate students. Course 230, 250, and Applied Mathematics and Statistics 205A or 205B recommended. The Staff

**260. Information Retrieval. \***

Course covers major topics of information retrieval, including statistical characteristics of text, several important retrieval models,

## Technology Management

text clustering, text classification, text filtering, web analysis, information extraction, peer to peer research, distributed search, personalized search, and other related topics. Enrollment restricted to graduate students. Undergraduates may enroll with permission of instructor. Y. Zhang

### **270. Service Engineering and Management. \***

Introduction to service engineering and management, from the role of services in the global economy to analytical models in service operations management. This field is developing rapidly; the material covers the fundamental principles of services as well as recent research. Topics include designing efficient service networks, forecasting, resource allocation, and globalization. Enrollment restricted to graduate students. The Staff

### **280A. Graduate Research Seminar (2 credits). \***

Weekly seminar series in topics of current research in information systems and technology management. Enrollment by permission of instructor.

Enrollment limited to 30. May be repeated for credit. The Staff

### **280I. Seminar on Information Retrieval and Knowledge Management (2 credits). \***

Seminar series discussing advanced topics in information retrieval and knowledge management. Current research and literature are presented during each meeting. Enrollment restricted to graduate

students. Enrollment limited to 20. May be repeated for credit. The Staff

### **280M. Sales and Marketing for Technologists and Engineers (2 credits). S**

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. The Staff

### **280S. Seminar Topics (2 credits). W**

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. Enrollment limited to 30. May be repeated for credit. Y. Chen, The Staff

### **283. Special Topics in Technology and Information Management (3 credits).**

Graduate seminar on topics in technology and information management that varies with the particular instructor. Topics may include, but are not limited to: data analytics, information retrieval, recommender systems, technology management, and the economics of

information and technology. Enrollment restricted to graduate students. B. Haddad

### **293. Advanced Topics in Technology and Information Management (TIM).**

Advanced research topics in TIM (as determined by instructor). Topics include, but are not limited to, approaches and solutions to complex business problems, and development of information-based technology and services. Enrollment restricted to graduate students. Enrollment limited to 25. May be repeated for credit. The Staff

### **296. Master Project. F,W,S**

Master project conducted under faculty supervision. Petition on file with sponsor faculty. Enrollment is restricted to graduate students. May be repeated for credit. The Staff

### **297. Independent Study. F,W,S**

Independent study under faculty supervision. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **299. Thesis Research. F,W,S**

Thesis research under faculty supervision. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# ENVIRONMENTAL STUDIES

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2015-16 General Catalog

405 Interdisciplinary Sciences Building

(831) 459-2634

<http://envs.ucsc.edu>

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## PROGRAM DESCRIPTION

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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 agroecological 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, economical 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.

In addition to the single environmental studies major, students may 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).

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

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### DECLARATION OF THE MAJOR

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Students wishing to declare within the Environmental Studies Department should visit the [environmental studies web site](#) and follow the steps listed there. Study plans may be downloaded from the [environmental studies web site](#).

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### MAJOR QUALIFICATION POLICY

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#### A. Environmental Studies Major

Students may petition to declare the Environmental Studies major once they have completed the following required courses: Environmental Studies 23; Environmental Studies 24 (or Biology: Ecology and Evolutionary Biology 20C); Environmental Studies 25; Applied Mathematics and Statistics 7/L or Ocean Sciences 90. Students receiving an NP, D, or F in one of the courses required for admission to the major may only declare once they have passed the same or equivalent course with a grade of C or better. Students who receive two grades of NP, D, or F in the required courses are not eligible to declare the major.

#### B. Environmental Studies/Biology Combined Major

Students may petition to declare the Environmental Studies/Biology combined major once they have completed the following courses: Environmental Studies 25; Ecology and Evolutionary Biology 20C; Molecular, Cell, and Developmental Biology 20A Chemistry 1A; Applied Mathematics and Statistics 7/L. Students receiving an NP, D, or F in one of the courses required for admission to the major may only declare once they have passed the same or equivalent course

## Environmental Studies

with a grade of C or better. Students who receive two grades of NP, D, or F in the required courses are not eligible to declare the major.

### **C. Environmental Studies/Earth Sciences Combined Major**

Students may petition to declare the Environmental Studies/Earth Sciences combined major once they have completed the following courses: Environmental Studies 24 (or Biology: Ecology and Evolutionary Biology 20C); Environmental Studies 25; Chemistry 1A; Applied Mathematics and Statistics 7/L, or Ocean Sciences 90. Students receiving an NP, D, or F in one of the courses required for admission to the major may only declare once they have passed the same or equivalent course with a grade of C or better. Students who receive two grades of NP, D, or F in the required courses are not eligible to declare the major.

### **D. Environmental Studies/Economics Combined Major**

Students may petition to declare the environmental studies/economics combined major once they have completed the following courses: Environmental Studies 23; Environmental Studies 24 (or Biology: Ecology and Evolutionary Biology 20C); Environmental Studies 25; Economics 1; Economics 11A; and either Applied Mathematics and Statistics 5 or 7/L. Students receiving an NP, D, or F in one of the courses required for admission to the major may only declare once they have passed the same or equivalent course with a grade of C or better. Students who receive two grades of NP, D, or F in the required courses are not eligible to declare the major.

### **APPEAL PROCEDURE**

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.

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## REQUIREMENTS FOR THE ENVIRONMENTAL STUDIES MAJOR

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### **PREREQUISITES FOR THE SINGLE MAJOR**

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Continuing UCSC students are required to complete all six prerequisite courses before taking Environmental Studies 100/L. Five of the prerequisite courses are preset and are listed below. See the course descriptions for more specific information.

Environmental Studies 23, The Physical and Chemical Environment (offered in spring and summer quarters)

Environmental Studies 24, General Ecology (offered in fall and summer quarters). \*

Environmental Studies 25, Environmental Policy and Economics. Offered in winter and summer quarters.

Applied Mathematics and Statistics 2, Prestatistics, or Applied Mathematics and Statistics 6, Precalculus for Statistics; or Applied Mathematics and Statistics 3, Precalculus for Science and Engineering; or Mathematics 3, Precalculus; or a score of 3 or higher on the College Board AP calculus examination, or equivalent. Check the catalog for the quarters offered.

Applied Mathematics and Statistics 7/L, Statistical Methods for the Biological and Environmental Studies, or Ocean Sciences 90, Fundamentals of Climate. A score of 4 or higher on the College Board AP Statistics examination waives this requirement. Check the catalog for the quarters offered. \*

\*Prerequisite for Environmental Studies 24 and Applied Mathematics and Statistics 7/L is Applied Mathematics and Statistics 2 or 3 or 6, or Mathematics 3.

In addition, students choose one introductory course in sociology, cultural anthropology, or ethics. The acceptable courses are as follows:

Anthropology 2, Introduction to Cultural Anthropology

Sociology 1, Introduction to Sociology

Sociology 10, Issues and Problems in American Society

Sociology 15, World Society

Philosophy 22, Introduction to Ethical Theory

Philosophy 24, Introduction to Ethics: Contemporary Moral Issues

Philosophy 28, Environmental Ethics

Philosophy 80G, Bioethics in the 21st Century: Science, Business, and Society

The following are two recommend academic plans for pursuing the environmental studies single major. Plan One is for students who place into Mathematics 3, Precalculus, and Plan Two is for students who place out of Mathematics3, Precalculus.

<b>Plan One for students placing into Mathematics 3</b>			
Year	Fall	Winter	Spring
1st (frsh)	MATH 3 or AMS 2 or 6 or 3	AMS 7/L or SOC/ANTH/Ethics ENVS 25	ENVS 23
2nd (soph)*	ENVS 24		ENVS 100/L
	AMS 7/L or SOC/ANTH/Ethics	ENVS 100/L or spring	
3rd (jr)			

<b>Plan Two for students placing out of Mathematics 3</b>			
Year	Fall	Winter	Spring
1st (frsh)		ENVS 25	ENVS 23
		AMS 7/L or SOC/ANTH/Ethics	AMS 7/L or SOC/ANTH/Ethics
2nd (soph)	ENVS 24	ENVS 100/L or spring	ENVS 100/L

**TRANSFER STUDENTS**

Transfer students pursuing environmental studies majors are encouraged to transfer in the fall quarter. Students transferring to UCSC should complete as much of the lower-division curriculum as possible, with a grade of C or better, at another recognized institution before transferring to UCSC. Below is an outline of acceptable substitute courses for the lower-division environmental studies single major prerequisites. Please note that all students wishing to pursue a single environmental studies major must complete Applied Mathematics and Statistics 7/L (or Economics 113 for combined majors with economics) at UCSC to fulfill the statistics requirement needed to begin upper-level environmental studies coursework. It is recommended that transfer students plan to enroll in Applied Mathematics and Statistics 7/L or Economics 113, and any other missing prerequisite during the summer or fall quarter in order to take Environmental Studies 100/L in winter or spring quarter. Transfers can formally declare their major once qualifying courses are successfully completed (see [Major Qualification Policy](#)). Completion of an introductory college chemistry course will substitute for Environmental Studies 23. Completion of a general ecology course will substitute for Environmental Studies 24. Completion of both a politics and economics course will substitute for Environmental Studies 25.

A college-level precalculus course will substitute for Mathematics 3 or Applied Mathematics and Statistics 3 at UCSC.

Environmental Studies 23, 24, and 25 are offered during Summer Session at UCSC, and transfer students are encouraged to take them. If you are transferring, compare catalog descriptions, consult your current institution's adviser, and refer to the [ASSIST web site](#) to determine equivalency.

**UPPER-DIVISION REQUIREMENTS**

In addition to lower-division coursework, students are required to complete nine upper-division courses: Environmental Studies 100/L, Ecology and Society (environmental studies core course, offered twice yearly during the winter and spring quarters).

Seven upper-division electives (environmental studies courses numbered 101-179). One must be based in the social sciences and one course must be based in the natural sciences. List of these courses is available from the Environmental Studies Department.

See the [senior comprehensive requirement](#) below.

**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 Environmental Studies 100/L and one of the following courses: 109B, 183B, 190, 195A, 195B, or 196.

**COMPREHENSIVE REQUIREMENT**

The senior comprehensive may be satisfied by completing one of the options listed below. 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.

ENVS 109B, Ecology and Conservation in Practice Supercourse: Ecological Field Methods Laboratory

Environmental Studies 183A and 183B, Senior Internship

Environmental Studies 190, Capstone Course: Environmental Problem Solving (offered spring quarter only)

## Environmental Studies

Environmental Studies 195A or 195B, Senior Thesis  
Environmental Studies 196 (one course from the series), Senior Seminar

Students with advanced skills in one of the graduate focal areas may also take a graduate seminar by invitation from the instructor.

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### REQUIREMENTS FOR THE COMBINED MAJORS

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#### ENVIRONMENTAL STUDIES/BIOLOGY

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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.

#### LOWER-DIVISION REQUIREMENTS

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All courses must be taken for a letter grade.

Biology and mathematics courses may require placement examinations. See course descriptions for prerequisite information.

Ecology and Evolutionary Biology 20A, 20B, and 20C  
Environmental Studies 25

Anthropology 2; or Philosophy 21, 22, 24, 28, or 80G; or Sociology 1, 10 or 15

Applied Mathematics and Statistics 3, Precalculus, or Applied Mathematics and Statistics 2, Prestatistics, or Applied Mathematics and Statistics 6, Precalculus for Statistics; Mathematics 3; or a score on the math placement examination or the College Board AP calculus examination sufficient to be placed into calculus)

Applied Mathematics and Statistics 7 and 7L

Chemistry 1A, 1B, and 1C/N

Two courses in physics, Physics 1 and 2, or Physics 6A/L and 6B or 6C.

#### UPPER-DIVISION REQUIREMENTS

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Students are required to complete nine upper-division courses and the comprehensive requirement listed below.

Environmental Studies 100/L (prerequisites are: Chemistry 1A; Ecology and Evolutionary Biology 20C; Environmental Studies 25; Applied Mathematics and Statistics 2 or 3 or 6, or Mathematics 3; Applied Mathematics and Statistics 7/L; and the cultural anthropology/sociology/philosophy option).

Biology 105, Genetics

Biology 109, Evolution

Six upper-division courses, three in biology and three in environmental studies. One of the six must be a laboratory course, and one of the three environmental studies courses must be based in the social sciences. Students wishing to pursue an advanced degree in the pure or applied sciences are strongly encouraged to complete the organic chemistry series as well. Chemistry 108A/L and 108B/M may be substituted to fulfill one of the upper-division biology elective requirements.

These upper-division elective courses should be selected in pursuit of a coherent plan of study, chosen in consultation with faculty sponsors from both the Biological Sciences and Environmental Studies Departments. None of the three environmental studies upper-division courses can be an environmental studies internship, individual study, or substitution course.

#### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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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 Environmental Studies 100/L and one of the senior comprehensive options for single environmental studies majors or

Biology: Ecology and Evolutionary Biology 109.

#### COMPREHENSIVE REQUIREMENT

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Students satisfy the senior comprehensive requirement by completing either:

one of the options for environmental studies majors (see Comprehensive Requirement above); or

one of the approved internships, independent research or field course or a thesis

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### ENVIRONMENTAL STUDIES/EARTH SCIENCES

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This course of study provides students with the basic tools of Earth sciences and environmental studies needed to address environmental problems.

#### LOWER-DIVISION REQUIREMENTS

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Applied Mathematics and Statistics 7 and 7L or Ocean Sciences 90

Mathematics 11A-B (or 19A-B)

Chemistry 1A, 1B/M, and 1C/N

Physics 6A/L and 6B/M (or 5A/L and 5B/M)

Earth Sciences 20/L (or 5/L or 10/L)

Environmental Studies 24 and 25

## Environmental Studies

Anthropology 2 or Philosophy 21, 22, 24, 28, or 80G or Sociology 1, 10, or 15.

### UPPER-DIVISION REQUIREMENTS

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Earth Sciences 110A/L, 110B/M, or 110C/N

Environmental Studies 100/L (Prerequisites are: Chemistry 1A, Ecology and Evolutionary Biology 20C, Environmental Studies 25, Applied Mathematics and Statistics 2 or 3 or 6, or Mathematics 3, Applied Mathematics and Statistics 7/L, and the cultural anthropology/sociology/philosophy option)

Three additional upper-division environmental studies courses, including at least one course based in the social sciences

Three additional upper-division Earth sciences courses

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 Sciences Departments. None of the three environmental studies upper-division courses can be an environmental studies internship, individual study or substitution course.

### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC Requirement for the environmental studies/Earth and planetary sciences combined major is satisfied by completing Environmental Studies 100/L and one of the senior comprehensive options for single environmental studies majors, or Earth Sciences 195 or 188A-B.

### COMPREHENSIVE REQUIREMENT

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Students satisfy their senior comprehensive requirement in environmental studies or Earth sciences by completing either:

- One of the senior comprehensive options for single environmental studies majors (see [Comprehensive Requirement](#) above) or
- one of the senior comprehensive options for Earth sciences majors (see Comprehensive Requirement under Earth Sciences).

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## ENVIRONMENTAL STUDIES/ECONOMICS

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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.

### LOWER-DIVISION REQUIREMENTS

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Economics 1, 2, 11A, 11B, AMS 5 or AMS 7/L

Environmental Studies 23, 24, 25

Anthropology 2; or Philosophy 21, 22, 24, 28, or 80G; or Sociology 1, 10 or 15.

### UPPER-DIVISION REQUIREMENTS

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Economics 100A(100M), Intermediate Microeconomics

Economics 113, Econometrics

Environmental Studies 100/L

Six upper-division elective courses, three in economics and three in environmental studies. Economics electives must be chosen from the following list: 100B(100N), 101, 114, 115, 120, 128, 130, 131, 133, 135, 136, 138, 139A, 139B, 140, 141, 142, 150, 156, 160A, 160B, 161A, 162, 165, 169, 180, 183.

Environmental Studies electives must be chosen from those numbered 101-179, with at least one course based in the natural sciences. None of the three environmental studies upper-division courses can be an environmental studies internship, individual study or substitution course.

### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

---

Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC Requirement in environmental studies/economics combined major is satisfied by completing Environmental Studies 100/L and one of the senior comprehensive options for single environmental studies majors.

### COMPREHENSIVE REQUIREMENT

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Students satisfy the senior comprehensive requirement by completing the following:

one of the options for environmental studies majors (see Comprehensive Requirement above); and pass those portions of the economics comprehensive examination administered in Economics 100A(100M) and 113.

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## AGROECOLOGY AND SUSTAINABLE FOOD SYSTEMS CONCENTRATION

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The major academic objective of the agroecology and sustainable food systems concentration is to provide students with a depth of expertise within the environmental studies major. Specifically, completing the concentration will allow students to develop expertise and interdisciplinary knowledge of

## Environmental Studies

agroecology and sustainable agriculture. Students in the agroecology and sustainable food systems concentration will learn about ecological concepts that can be applied to the development of sustainable agricultural systems and will also develop their understanding of social, political, and economic aspects of agriculture. Students will also have access to 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.

The agroecology and sustainable food systems concentration is available to students pursuing an environmental studies single major or an environmental studies combined major in economics, Earth sciences, or biology.

### REQUIREMENTS FOR AGROECOLOGY AND SUSTAINABLE FOOD SYSTEMS CONCENTRATION

Students pursuing the agroecology and sustainable food systems concentration abide by all rules and requirements of the environmental studies single or environmental studies combined major. The agroecology and sustainable food systems concentration includes three required courses (one in social sciences, one in natural sciences, one field-based course) and one elective course from the list below (no substitutions will be accepted). In addition, students will complete their environmental studies senior exit (ENVS 109B, ENVS 190, ENVS 196, ENVS 195, or ENVS 183A/B) in a topic related to agroecology and sustainable food systems.

Required upper-division courses: ENVS 130A/L, ENVS 130B, and ENVS 130C or ENVS 133

List of elective courses (choose one): ENVS 108, 129, 131, 143, 146, 161A/L, 162/L, 163/L, 165, 166, 168, 169, 170, or CMMU 149 or CMMU 186.

In addition to coursework, it is strongly recommended that students complete at least one internship related to agroecology, sustainable agriculture, or sustainable food systems (either upper- or lower-division internship).

**Note for students pursuing environmental studies single majors.** Students pursuing the environmental studies single major and the agroecology and sustainable food systems concentration will take the following upper-division courses: ENVS 100, 130A/L, 130B, 130C (or 133); one course from the list of elective courses above; three additional environmental studies electives; and an environmental studies senior exit (ENVS 109B, ENVS 190, ENVS 196, ENVS 195, or ENVS

183A/B) in a topic related to agroecology and sustainable food systems.

**Note for students pursuing ENVS-combined majors.** Students pursuing the environmental studies combined majors in economics, Earth sciences, or biology and the agroecology and sustainable food systems concentration will take the following upper-division courses (in the environmental studies portion of their major): ENVS 100, 130A/L, 130B, 130C (or 133); one course from the list of elective courses above; and an environmental studies senior exit (ENVS 109B, ENVS 190, ENVS 196, ENVS 195, or ENVS 183A/B) in a topic related to agroecology and sustainable food systems.

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## HONORS

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**Senior Comprehensive Honors.** Only applicable is senior thesis, 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 advisor) must confer.

**Departmental Honors.** To be considered for departmental honors, students must have a grade point average (GPA) of 3.5 in upper-division environmental studies courses.

**Highest Departmental Honors.** To be considered for highest departmental honors, students must have a GPA of 3.75 in the major in upper-division environmental studies courses, and received honors on the senior comprehensive.

For combined majors, students must fulfill all requirements for honors from both departments.

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## GRADUATE PROGRAM

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The doctor of philosophy (Ph.D.) program in Environmental Studies at UCSC is an interdisciplinary program that draws equally from ecology and social sciences. Our interests in ecology engage most strongly with conservation biology, agroecology, and global change. Our interests in the social sciences bridge political ecology, geography, environmental policy, and politics, law, and environmental economics. We aim to train doctoral students to work effectively in disciplinary and interdisciplinary environments within the academy, in government agencies, and in public interest organizations and businesses.

Graduates of the program are expected to engage as scholars across natural and social sciences, to have deep intellectual strength in their area of specialty, and to have made substantial contributions toward the understanding of an environmental problem. We expect our doctoral students to be as skilled and intellectually rigorous within their research emphases as are

## Environmental Studies

students emerging from more traditional disciplinary programs but also to possess the knowledge needed to understand, analyze, and communicate in different but relevant fields of study. This expectation of intellectual breadth as well as disciplinary depth is a central goal of our doctoral program.

Given the strong interdisciplinary focus of the environmental studies Ph.D. program, study in other fields is encouraged. Most environmental studies faculty have secondary affiliations with other departments on campus. Students have the option of pursuing a “designated emphasis,” the equivalent of a graduate minor in another graduate program on campus. These provide a framework for in-depth study in specialized disciplinary fields and recognition of particular scholarly expertise. Designated Emphasis programs are available in numerous fields including ecology and evolutionary biology, anthropology, education, sociology, visual studies, statistics, politics, and Latin American and Latino studies.

### GENERAL REQUIREMENTS FOR THE DOCTORATE

The typical duration of the doctoral program is five to six years.

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 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.

In addition to the dissertation, students are expected to complete required coursework and to serve as teaching assistants in undergraduate courses for two quarters.

The Environmental Studies Department does not offer a terminal master’s degree, except for students who have been advanced to candidacy but who do not complete the Ph.D. dissertation.

### PROGRAM PREREQUISITES

The interdisciplinary nature of the core curriculum requires rigorous preparation at the undergraduate level. All entering students are expected to have completed at least one upper-division course in the following areas: economics, ecology/genetics, statistics, and either anthropology, sociology, politics or political economy.

### COMMITTEES AND EXAMINATIONS

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 biology may have two committee members who are ecologists and one who is a political scientist.

The committee helps guide the student in preparation for prequalifying 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 prequalifying examination must be taken no later than winter quarter of the third year.

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.

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.

### REQUIRED COURSES

Environmental Studies 201A, Keywords and Concepts: Geography and Ecology

Environmental Studies 201B, Keywords and Concepts: Biogeochemistry and Environmental Policy

Environmental Studies 201M, Interdisciplinary Research Methods

Environmental Studies 201N, Interdisciplinary Research Design

An approved graduate course in quantitative methods that provides a basis in research design and analysis

Two of the following, one each from the social and natural sciences:

Social Sciences:

- Environmental Studies 210, Political Ecological Thought and the Environment or
- Environmental Studies 240, Public Policy and Conservation

Natural Sciences:

- Environmental Studies 220, Conservation Biology, or

## Environmental Studies

- Environmental Studies 230, Agroecology and Sustainable Agriculture

These courses are designed to ensure that students acquire disciplinary depth in their chosen research fields; gain experience of their research communities; and refine the research skills necessary to perform successfully in their professional arena.

In addition, every quarter before advancement to candidacy, all students are required to participate in:

Environmental Studies 290, Interdisciplinary Research Seminar (2 credits)

Environmental Studies 290L, Graduate Research Seminar (2 credits)

Environmental Studies 292, Topics in Research in Environmental Studies (2 credits)

Graduate students are encouraged to participate in course Environmental Studies 291, Advanced Readings in Environmental Studies, in areas of interest.

### REQUIREMENTS FOR THE DESIGNATED EMPHASIS IN ENVIRONMENTAL STUDIES

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Doctoral students from other departments at UCSC may complete a designated emphasis in environmental studies by completing ENVS 201A, ENVS 201B, two advanced graduate courses in ENVS (from an approved list), and two quarters of ENVS 292. In addition, students must have an environmental studies faculty member on their qualifying examination and thesis reading committees, complete a significant scholarly written component on an environmental topic, and complete the requirements for Ph.D. in their own department.

### APPLICATION AND ADMISSION

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For admission to the doctoral program, students must have completed a bachelor's degree or the equivalent in an area related to environmental studies. Most students entering the program either hold a master's degree or have several years work experience beyond the bachelor's.

Superior scholarship, capacity to carry out independent research, and commitment to scholarly work in an interdisciplinary context must be demonstrated in the statement of purpose, coursework, Graduate Record Examination (GRE) General Test, and letters of recommendation. Prospective students must contact faculty directly to inquire about sponsorship for admission to the program. Students are rarely accepted into the program without significant, early communications with potential faculty sponsors. See the [faculty list](#) for contact information.

Other considerations for admission include grades, evaluations, publications, professional or extramural experience, and more than one degree (second bachelor's or master's). Students are required to have completed coursework, or equivalent practical experience, in ecology, statistics, sociology/political science, and economics. Limited deficiencies in these areas can be remedied during the first year of graduate study. In addition to the application materials, students are strongly encouraged to submit a substantial written project (undergraduate or master's research project).

Admissions information and the online graduate application are at the [UCSC Division of Graduate Studies](#).

Admission is only considered for the fall quarter. Completed applications are due by December 15th of the previous academic year.

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## ENVIRONMENTAL STUDIES FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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#### **Christopher Benner**

Social aspects of information technology, social equity in urban and regional development, social movements and innovative community/labor organizing, political ecology of urban systems

#### **Weixin Cheng**

Soil ecology, agroecology, biogeochemistry, global change ecology

#### **Tim Duane**

Environmental law and policy, renewable energy development, ecosystem-based management, land use planning and regulation, water law and policy, conservation easements, climate law and policy

#### **Margaret FitzSimmons**

Social and spatial aspects of environmental change, the development and regulation of primary-sector activities and the regional integration of environmental planning and resources management institutions in urban and rural settings

**Gregory S. Gilbert**

Disease ecology, forest ecology, tropical ecology, biological invasions, conservation biology, applied evolutionary ecology

**Brent Haddad**

Fresh-water economics, policy, and communications; economic institutions and the environment; climate-change mitigation and adaptation; institutional and ecological economics

**Karen D. Holl**

Restoration ecology, conservation biology, landscape ecology, tropical ecology

**Sheldon Kamieniecki**

Environmental politics and policy; agenda building; strategic regulatory planning; business and interest group influence; political campaigns and elections; research methodology

**Deborah K. Letourneau**

Agroecology, tropical biology, insect-plant interactions, biological conservation for ecosystem services, biological processes as an alternative to pesticides, environmental risks of genetically engineered organisms, redwood forest community ecology

**Daniel M. Press**

U.S. environmental politics and policy, water quality, industrial ecology, resources management, policy analysis

**Carol Shennan**

Agroecology, ecosystem processes, organic agriculture, participatory research, agricultural development with a focus on Africa

**Andrew Szasz**

Environmental sociology (environmental movements, policy, environmental justice), theory

**Erika Zavaleta**

Biodiversity and global change, biological invasions, terrestrial plant and ecosystem ecology, human ecology, conservation science

ASSOCIATE PROFESSOR

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**Jeffrey T. Bury**

Political ecology; sustainable development; Latin America; extractive industries; climate change; new models of conservation

**Michael E. Loik**

Plant physiological ecology, climate change ecology, biometeorology, ecohydrology

**Flora Lu**

Ecological anthropology, indigenous resource management and household economics, conservation,

market integration, environmental justice, Amazon rainforest, Ecuador

**Stacy M. Philpott**

Agroecology, biodiversity, climate change, community ecology, conservation biology, ecosystem services, food sovereignty, landscape ecology, insects, tropical biology, urban ecology

**S. Ravi Rajan**

Environmental history and political ecology, risk and disaster studies, science and technology studies, North-South environmental conflicts, environmental social theory, environmental ethics

**Christopher C. Wilmers**

Wildlife ecology, conservation biology, global change ecology, ecological modeling

ASSISTANT PROFESSOR

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**Madeleine Fairbairn**

Environmental sociology, sociology of agriculture, property ownership and land tenure, food politics and social movements, Latin America, political ecology

**Adam Millard-Ball**

Transportation planning and policy, environmental economics, urban sustainability, climate change policy

**Zdravka Tzankova**

Environmental policy and politics; coastal and marine policy; market-based governance; private regulation; strategic litigation

ADJUNCT ASSOCIATE PROFESSOR

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**Catherine Burns**

Conservation biology, migratory birds, freshwater ecosystems, population and community ecology, natural resource management

**Renee Kidson**

Hydrology, water resource management, urban water supply training, climate change and Antarctic science, military history

**Heather Tallis**

Natural resource management, ecosystem services, social ecological systems, environmental impact assessment and mitigation, economics, environmental psychology

ENVIRONMENTAL STUDIES EMERITUS FACULTY

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**Robert R. Curry**

**Bryan H. Farrell**

**Stephen R. Gliessman**

**David Goodman**

**Paul L. Niebanck**

**James E. Pepper**

## Environmental Studies

**Alan Richards**

**Michael E. Soulé**

### ENVIRONMENTAL STUDIES LECTURERS

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**Sarah Rabkin**

Environmental and science journalism, the literary and visual arts in natural history practice

**Andrew Schiffrin**

Environmental assessment, transportation, land use planning, water supply planning



**Doris Ash (Education)**

Informal science learning, teacher professional development, science discourse in and out of the classroom

**Giacomo Bernardi (Ecology and Evolutionary Biology)**

Fish biology, phylogenetics, evolution

**Kenneth W. Bruland, Emeritus (Ocean Sciences)**

**Edmund Burke III, Emeritus (History)**

**Melissa L. Caldwell (Anthropology)**

Poverty and public health; welfare, charity, and assistance; food and consumption; gardens, nature, and landscapes; religion; socialism and postsocialism; Russia, the former Soviet Union, and Eastern Europe

**Patrick Y. Chuang (Earth and Planetary Science)**

Clouds, aerosols and climate

**Mark Cioc (History)**

German history, modern European history, environmental history

**Daniel P. Costa (Ecology and Evolutionary Biology)**

Physiological ecology of marine mammals and birds

**Donald Croll (Ecology and Evolutionary Biology)**

Ecology and conservation of islands and seabirds

**Ben Crow (Sociology)**

International development, sociology of water and markets, global inequality, South Asia and East Africa, political economy, and green enterprise

**Jennifer Derr (History)**

Colonial and Post-colonial Middle Eastern history; Egypt; agricultural and environmental history; Ottoman history; spatial politics; African history; Islamic history; history of science; history of medicine

**Kent Eaton (Politics)**

Comparative politics, Latin America, international relations, political economy, public policy, political institutions

**James Estes (Ecology and Evolutionary Biology, and Ocean Sciences)**

Marine sciences, community ecology, species interactions

**Andrew Fisher (Earth and Planetary Sciences)**

Hydrogeology, crustal studies, heat flow, modeling

**Laurel R. Fox (Ecology and Evolutionary Biology)**

Terrestrial population and community ecology, plant-animal interactions

**Diane Gifford-Gonzalez (Anthropology)**

Neolithic Africa and Eurasia, colonial New Mexico, origins of food production, pastoralists, zooarchaeology, history of archaeology, interpretive theory, visual anthropology

**James B. Gill, Emeritus (Earth and Planetary Sciences)**

**Gary B. Griggs (Earth and Planetary Sciences)**

Coastal processes, hazards and engineering

**Daniel Guevara (Philosophy)**

Kant, moral philosophy, moral psychology, environmental ethics, history of modern philosophy

**Julie H. Guthman (Social Sciences)**

Sustainable agriculture and alternative food movements, California agriculture, international political economy of food and agriculture, politics of obesity, political ecology, race and food, epigenetics and environmental health, critical nutrition, critical human geography

**Donna J. Haraway, Emerita (History of Consciousness and Feminist Studies)**

**Susan Harding, Emerita (Anthropology)**

**A. Marm Kilpatrick (Ecology and Evolutionary Biology)**

Disease ecology, population biology, conservation

**Paul L. Koch (Earth and Planetary Sciences)**

Isotope biogeochemistry, vertebrate paleontology

**Kristy Kroeker (Ecology and Evolutionary Biology)**

Global change biology, community ecology, applied marine ecology, climate change, ocean acidification, multiple stressors

**Ronnie D. Lipschutz (Politics)**

International relations; global political economy; foreign policy; resource/environmental politics; global political networks; global civil society and social movements; popular culture and politics; technology and society; risk society, state transformation and global governmentality

**Andrew Salvador Mathews (Anthropology)**

Environmental anthropology, science and technology studies, conservation and development, climate change, environmental history, Mexico, Latin America, Italy

**Ingrid M. Parker (Ecology and Evolutionary Biology)**

Plant ecology, plant-pathogen interactions, biological invasions

**Adina Paytan, IMS Research Scientist (Earth and Planetary Sciences)**

Biogeochemistry, paleoceanography, environmental and aquatic chemistry

**Maya Peterson (History)**

Russian and Soviet history; environmental history; comparative empire; colonialism; global exchanges of scientific knowledge and expertise; technology transfer; historical geography, spatial history and mapping, Central Asia; Silk Roads

**Jarmila Pittermann (Ecology and Evolutionary Biology)**

Plant physiology

**Grant H. Pogson (Ecology and Evolutionary Biology)**

Molecular population genetics, ecological genetics, marine invertebrates and fishes

**Donald C. Potts (Ecology and Evolutionary Biology)**

Coral reef ecology, genetics, evolution, and geological history; marine biodiversity; tropical biology, global change, and remote sensing

**Peter T. Raimondi (Ecology and Evolutionary Biology)**

Marine ecology, evolutionary ecology, experimental design, applied ecology

**Jennifer E. Reardon (Sociology)**

Science studies; sociology of science, technology, and medicine; feminist theory; race/ethnicity/gender/sexuality/class; biology and society

**Danilyn Rutherford (Anthropology)**

Borders and frontiers, colonialism, nationalism, ethnicity, kinship, performance, Christianity, secularism, sovereignty, publics, affect, technology, governancy, theory and method in anthropology, West Papua, Indonesia, the U.S.

**Barry Sinervo (Ecology and Evolutionary Biology)**

Animal behavior, evolution, physiological ecology

**Lisa C. Sloan, Emerita (Earth and Planetary Sciences)**

**Donald R. Smith (Microbiology and Environmental Toxicology)**

Neurotoxicity, cellular and organismal responses to environmental toxins

**Dana Y. Takagi (Sociology)**

Social inequality, affect, religion, race, quantitative analysis

**Anna Tsing (Anthropology)**

Culture and politics; feminist theory; globalization; multi-species anthropology; social landscapes and forest ethnologies; multi-sited ethnography; Indonesia, Southeast Asia, and the U.S.

**Slawek M. Tulaczyk (Earth and Planetary Science)**

Glaciology and glacial geology, soil mechanics

**Terrie M. Williams (Ecology and Evolutionary Biology)**

Large mammal physiology, bioenergetics, exercise and environmental physiology

**Patricia Zavella (Latin American and Latino Studies)**

Transnational migration by Mexicans, poverty, family sexuality, labor, social networks, feminist studies, Chicana/o-Latina/o studies, ethnographic research methods

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## ENVIRONMENTAL STUDIES COURSES

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### LOWER-DIVISION COURSES

**15. Natural History of the UCSC Campus (2 credits). \***

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. The Staff

**17. Curation of Natural History Collections (2 credits). W**

Introduction and training in the skills needed to create, manage, and exhibit natural history collections, including plants, insects, fungi, birds, mammals, reptiles, and amphibians. Enrollment limited to 12. C. Lay

**23. The Physical and Chemical Environment. S**

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. (General Education Code(s): IN.) The Staff

## Environmental Studies

### **24. General Ecology. F**

Covers principles of ecology including limits to species abundances, evolutionary ecology, population dynamics, community interactions and patterns, and ecosystem patterns and dynamics. Prerequisite(s): Applied Mathematics and Statistics 2 or 3 or 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; course 23 recommended as prerequisite to this course. (General Education Code(s): SI, IN.) The Staff

### **25. Environmental Policy and Economics. W**

Introduces the policy and economic dimensions of some pressing environmental challenges. Uses examples from population, water, climate change, and other topics to examine the economic underpinnings of environmental problems, the process of environmental policy-making, and the trade-offs in different policy solutions. (General Education Code(s): PE-E, IS.) A. Millard-Ball

### **42. Student-Directed Seminar. F,W,S**

Seminars taught by upper-division students under faculty supervision. (See course 192.) The Staff

### **42D. Student -Directed Seminar: Building Naturalist Community (2 credits). F**

Using the rich and expansive landscape of the UCSC campus as classroom, students experientially study topics in natural history and develop practices for learning about and connecting with nature that span scientific inquiry, writing, mindfulness, art, and more. Enrollment limited to 12. D. Letourneau

### **65. Introduction to Fresh Water: Processes and Policy. \***

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 course 165. (General Education Code(s): PE-E.) B. Haddad

### **80A. The Future of Rain Forests. \***

A broad overview of both ecological and social aspects related to tropical rain forests drawing on case studies worldwide. Topics include the biology and distribution of rain forests, causes and effects of their destruction, and management options to facilitate their conservation. (General Education Code(s): PE-E, T7-Natural Sciences or Social Sciences.) (S) The Staff

### **80B. The Ecological Forecast for Global Warming. F**

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. (General Education Code(s): PE-E, T7-Natural Sciences or Social Sciences.) M. Loik

### **83. Environmental Studies Internship. F,W,S**

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. May be repeated for credit. (General

Education Code(s): PR-S.) The Staff

### **91F. Community and Agroecology (2 credits). \***

Interdisciplinary two-credit seminar designed to introduce students to concepts of community and agroecology in the context of sustainability. Course can serve as a gateway to or as a continuing basis for participation in PICA (Program in Community and Agroecology). Specific topics and readings change each quarter. May be repeated for credit. The Staff

### **99. Tutorial. F,W,S**

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. May be repeated for credit. The Staff

### **99F. Tutorial (2 credits). F,W,S**

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. May be repeated for credit. The Staff

## UPPER-DIVISION COURSES

### **100. Ecology and Society. W,S**

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

## Environmental Studies

that knowledge to context-dependent explanations of environmental problems.

Prerequisite(s): course 23 or CHEM 1A; course 24 or BIOE 20C; course 25; and AMS 7/L or ECON 113 or OCEA 90; and one from: ANTH 2, SOCY 1,10,15, PHIL 21,22,24,28, or 80G. Concurrent enrollment in 100L is required. The Staff

### **100L. Ecology and Society Writing Laboratory (2 credits). W,S**

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 course 100.

Prerequisite(s): Satisfaction of the Entry Level Writing and Composition requirements. Concurrent enrollment in 100 is required. (General Education Code(s): PR-E.) The Staff

### **104A. Introduction to Environmental Field Methods. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements; concurrent enrollment in course 104L and previous or concurrent enrollment in courses 100/L

required, or by permission of instructor. (General Education Code(s): W.) E. Zavaleta

### **104L. Field Methods Laboratory (2 credits). \***

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. Concurrent enrollment in course 104A is required. E. Zavaleta

### **106A. Natural History of Birds. \***

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. Students are billed a materials fee.

Prerequisite(s): previous or concurrent enrollment in courses 100 and 100L, or by permission of instructor. Course 105 or Biology 138 are recommended. Enrollment limited to 25. The Staff

### **107A. Natural History Field Quarter. S**

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 courses 100 and 100L; concurrent enrollment in courses 107B and 107C required. Students are billed a materials fee. The Staff

### **107B. Natural History Field Quarter. S**

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 courses 100 and 100L; concurrent enrollment in courses 107A and 107C required. The Staff

### **107C. Natural History Field Quarter. S**

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 courses 100 and 100L; concurrent enrollment in courses 107A and 107B required. The Staff

### **108. General Entomology. F**

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(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. Offered in alternate academic years. D. Letourneau

**108L. General Entomology Laboratory (3 credits). F**

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. Concurrent enrollment in course 108 is required. Offered in alternate academic years. D. Letourneau

**109A. Ecology and Conservation in Practice Supercourse: Ecological Field Methods. S**

An intensive, on-site learning experience in terrestrial field ecology and conservation, using the University of California Natural Reserves. 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. Lectures, field experiments, and computer exercises familiarize students with research methods, study design, statistical approaches, and analytical tools for ecological research. Enrollment by application. Prerequisite(s): BIOL 20A, BIOE 20B, BIOE 20C or ENVS 23, 24, 100; and AMS 7 and 7L. Concurrent enrollment in BIOE 151B-C-D or ENVS 109B-C-D 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, 150L, ENVS 104A or 196A. (Also offered as Biology:Ecology & Evolutionary 151A. Students cannot receive credit for both courses.) D. Croll, G. Dayton

**109B. Ecology and Conservation in Practice Supercourse: Ecological Field Methods**

**Laboratory. S**

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 by application. Prerequisite(s): Entry Level Writing and Composition requirements; BIOL 20A, BIOE 20B, BIOE 20C or ENVS 23, 24, 100; and AMS 7 and 7L. Concurrent enrollment in BIOE 151A-C-D or ENVS 109A-C-D 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, 150L, ENVS 104A or 196A. (Also offered as Biology:Ecology & Evolutionary 151B. Students cannot receive credit for both courses.) (General Education Code(s): W.) D. Croll, G. Dayton

**109C. Ecology and Conservation in Practice Supercourse: Functions and Processes of Terrestrial Ecosystems. S**

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 by application. Prerequisite(s): BIOL 20A, BIOE 20B, BIOE 20C or ENVS 23, 24, 100; and AMS 7 and 7L. Concurrent enrollment in BIOE 151A-B-D or ENVS 109A-B-D 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, 150L, ENVS 104A or 196A. (Also offered as Biology:Ecology & Evolutionary 151C. Students cannot receive credit for both courses.) D. Croll, G. Dayton

**109D. Ecology and Conservation in Practice Supercourse: Conservation in Practice. S**

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 by application. Prerequisite(s): BIOL 20A, BIOE 20B, BIOE 20C or ENVS 23, 24, 100; and AMS 7 and 7L. Concurrent enrollment in BIOE 151A-B-C or ENVS 109A-B-C 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, 150L, ENVS 104A or 196A. (Also offered as Biology:Ecology & Evolutionary 151D. Students cannot receive credit for both courses.) D. Croll, G. Dayton

**110. Institutions, the Environment, and Economic Systems. S**

Debate about environmental policy is often couched in economic terms. Environmental issues have become questions of political economy, as

## Environmental Studies

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(s): previous or concurrent enrollment in courses 100 and 100L, or by permission of instructor. (S) M. Fitzsimmons

### **115A. Geographic Information Systems and Environmental Applications. F**

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 course 215A. Prerequisite(s): Previous or concurrent enrollment in course 115L, 100/L, or permission of instructor. Course in computer science, Earth science, math, or geography recommended. The Staff

### **115L. Exercises in Geographic Information Systems (2 credits). F**

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 course 215L. Students are billed a materials fee. Concurrent enrollment in course 115A is required. The Staff

### **120. Conservation Biology. F**

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(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. C. Wilmers

### **122. Tropical Ecology and Conservation. S**

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(s): Previous or concurrent enrollment in courses 100 and 100L is required, or by permission of instructor. The Staff

### **123. Animal Ecology and Conservation. S**

Advanced course in animal ecology and conservation focusing on the ecology, behavior, biogeography, and evolution of vertebrates. Prerequisite(s): course 120. Previous or concurrent enrollment in courses 100 and 100L required; or by permission of instructor. C. Wilmers

### **125. Ecosystems of California. W**

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(s): previous or concurrent enrollment in courses 100/100L. (General Education Code(s): PE-E.) E. Zavaleta

### **129. Integrated Pest Management. \***

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(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. D. Letourneau

### **129L. Integrated Pest Management Laboratory (2 credits). \***

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(s): concurrent

## Environmental Studies

enrollment in course 129. The Staff

### **130A. Agroecology and Sustainable Agriculture. F**

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(s): Concurrent enrollment in course 130L and previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. C. Shennan

### **130B. Principles of Sustainable Agriculture. W**

Agricultural sustainability is examined as a complex set of interactions between ecological, social, and economic components of an agroecosystem. Case studies are drawn from issues facing current U.S. agriculture and a basis for formulating policy for change that ensures sustainability is developed. Prerequisite(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. M. Fairbairn

### **130C. Field Experiences in Agroecology and Sustainable Food. S**

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. Prerequisite(s): previous or concurrent enrollment in course 100/100L. Enrollment limited to 35. The Staff

### **130L. Agroecology and Sustainable Agriculture Laboratory (2 credits). F**

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. Concurrent enrollment in course 130A is required. C. Shennan

### **131. Insect Ecology. \***

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(s): previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. Offered in alternate academic years. S. Philpott

### **133. Agroecology Practicum. W,S**

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(s): courses 130A and 130L and previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. May be repeated for credit. The Staff

### **138. Field Ethnobotany. \***

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(s): courses 130A and 130L, or by permission of instructor. Concurrent enrollment in course 138L required. Offered in alternate academic years. The Staff

### **138L. Ethnobotany Laboratory (2 credits). \***

Laboratory and field studies allow students to learn the taxonomy of important useful plant families, carry out field studies on local plant use and management practices, and investigate in detail home garden agroecosystems and model systems. Prerequisite(s): concurrent enrollment in course 138 required. The Staff

### **140. National Environmental Policy. W**

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(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. The Staff

### **140L. National Environmental Policy Field Studies Laboratory (2 credits). \***

Students travel to waste-management facilities and environmental agencies around the San Francisco and Monterey Bay regions. Laboratory assignments include: facility profiles and policy-options memos related to each facility. Enrollment restricted to environmental studies majors, and

## Environmental Studies

environmental studies/economics, environmental studies/biology, or environmental studies/Earth sciences combined majors. Concurrent enrollment in course 140 is required. Enrollment limited to 24. The Staff

### **141. Ecological Economics. F**

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(s): Economics 1 is strongly recommended as preparation. Previous or concurrent enrollment in courses 100 and 100L is required, or by permission of instructor. The Staff

### **142. Energy Politics and Policy. W**

Explores the social and environmental dimensions of energy production and consumption. Provides an overview of the tools to evaluate a new clean-energy economy and its wider political and economic implications. Students study assessment tools, such as risk assessment, material energy balances, and life-cycle assessment. Prerequisite(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. The Staff

### **142L. Energy Politics and Policy Laboratory (2 credits). \***

Trains students in the concepts and skills required to make decisions about energy production. Concurrent enrollment in course 142 required. Enrollment limited to 24. The Staff

### **143. Sustainable Development: Economy, Policy, and Environment. W**

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(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. The Staff

### **145. Green Building Design. S**

Promotes an ecological approach to design with an understanding of the environmental opportunities and constraints at play on the site and situation; works with the environment to maximize human comfort and energy efficiency. Prerequisite(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. The Staff

### **146. Water Quality: Policy, Regulation, and Management. \***

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(s): course 100/L, and 140 or 149 or 150 or 165. (General Education Code(s): PE-E.) D. Press

### **147. Environmental Inequality/Environmental Justice. S**

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. Students cannot receive credit for this course and Sociology 185. Prerequisite(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. (General Education Code(s): ER.) The Staff

### **149. Environmental Law and Policy. S**

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. (Also offered as Legal Studies 149. Students cannot receive credit for both courses.) Prerequisite(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. T. Duane

### **150. Coastal and Marine Policy. W**

Introduces and analyzes the history, design, implementation, and effectiveness of key legal 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 targeting major transboundary issues like marine pollution and management of migratory fish stocks. Prerequisite(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. The Staff

**151. Environmental Assessment. S**

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(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. The Staff

**154. Amazonian Cultures and Conservation. \***

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. Students cannot receive credit for this course and Latin American and Latino Studies 167. (Formerly Latin American and Latino Studies 167, Amazonian Societies and the Environment) Prerequisite(s): previous or concurrent enrollment in course 100 and 100L, or permission of instructor. (General Education Code(s): CC, E.) The Staff

**156. Environmental Action through Writing. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements and previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. (General Education Code(s): W.) The Staff

**157. Writing in the Natural Sciences. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements and previous or concurrent enrollment in courses 100/L required, or by permission of instructor. (General Education Code(s): W.) The Staff

**158. Political Ecology and Social Change. F**

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(s): Previous or concurrent enrollment in courses 100 and 100L is required, or by permission of instructor. J. Bury

**159. Nature Literature. \***

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(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. The Staff

**160. Restoration Ecology. W**

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(s): Previous or concurrent enrollment in courses 100 and 100L is required, or by permission of instructor. K. Holl

**161A. Soils and Plant Nutrition. W**

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(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. W. Cheng

**161L. Soils and Plant Nutrition Laboratory (2 credits). W**

Practice analytical techniques for evaluation of physical, chemical, and biological properties of soils.

## Environmental Studies

Grow plants to observe some typical symptoms of plant nutrient deficiencies. Students are billed a materials fee. Prerequisite(s): Concurrent enrollment in course 161A is required. W. Cheng

### **162. Plant Physiological Ecology.**

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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(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. M. Loik

### **162L. Plant Physiological Ecology Laboratory (2 credits).**

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(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. M. Loik

### **163. Plant Disease Ecology.**

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

course 263. Prerequisite(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. G. Gilbert

### **163L. Plant Disease Ecology Lab (2 credits).**

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(s): concurrent enrollment in course 163 required. G. Gilbert

### **165. Freshwater Issues and Policy.**

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. Prerequisite(s): Previous or concurrent enrollment in courses 100 and 100L is required, or by permission of instructor. The Staff

### **166. Agroecosystem Analysis and Watershed Management.**

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(s): Previous or concurrent enrollment

in courses 100 and 100L required, or by permission of instructor; and course 130A or 130B or 129 or 133 or 160 or 167. The Staff

### **167. Freshwater and Wetland Ecology.**

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(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. The Staff

### **167L. Freshwater and Wetland Ecology Lab (2 credits).**

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. Students are billed a materials fee. Concurrent enrollment in course 167 is required. The Staff

### **168. Biogeochemistry and the Global Environment.**

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 course 268. Prerequisite(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. W. Cheng

**169. Climate Change Ecology. S**

Advanced topics in atmospheric science and ecological theory. Topics include impacts on biodiversity, carbon sequestration, sustainable agriculture, and innovative solutions.

Prerequisite(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor.

Enrollment limited to 40. M. Loik

**170. Agriculture and Climate Change. W**

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(s): previous or concurrent enrollment in course 100/100L. Enrollment limited to 35. The Staff

**171. Topics in Environmental Studies. \***

Readings and discussions of primary literature on a current environmental topic. Emphasizes experiential learning and research. The topics vary; consult current course listings. Prerequisite(s): courses 100 and 100L, or by permission of the instructor.

Enrollment limited to 20. The Staff

**172. Environmental Risks and Public Policy. F**

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. (Formerly Science, Policy, and the Environment.)

Prerequisite(s): previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. (General Education Code(s): W.) S. Rajan

**173. An Introduction to World Environmental History. W**

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(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. S. Rajan

**175. Biotechnology: Social and Environmental Dimensions. \***

Surveys the rapid development of genetic engineering science and biotechnology-based industries and examines the economic, health, environmental, legal, and social justice dimensions of new biotechnology applications: genetic screening, cloning, transgenic animals and crops, genetically engineered food, and biodiversity prospecting. Readings, lectures, World Wide Web site reviews, student presentations, and papers will address controversial choices faced now by scientists, farmers, doctors, consumers, public officials, and global governance agencies.

Prerequisite(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. The Staff

**176. Vulnerability, Complex Systems, and Disasters. \***

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(s): Previous or concurrent enrollment in courses 100 and 100L or by permission of the instructor. (General Education Code(s): PE-T.) S. Rajan

**177. Teaching Environmental Education. F**

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(s): previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. The Staff

**179. Environmental Interpretation. S**

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 will work to define their own interpretive philosophy, skills, and style. Background in natural history and/or experience working with children recommended.

Prerequisite(s): Previous or concurrent enrollment in courses 100 and 100L required, or by permission of instructor. The Staff

## Environmental Studies

### **183. Environmental Studies Internship. F,W,S**

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 courses 100 and 100L and by permission of instructor. Students submit petition to course sponsoring agency. May be repeated for credit. The Staff

### **183A. Senior Internship. F,W,S**

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 restricted to environmental studies majors and the combined majors with Earth science, biology, and economics. Enrollment by permission of instructor. The Staff

### **183B. Senior Internship. F,W,S**

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): course 183A. Students submit petition to course-sponsoring agency. Enrollment restricted to environmental studies majors and the combined majors

with Earth sciences, biology, and economics. The Staff

### **184. Environmental Studies Internship (2 credits). F,W,S**

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. May be repeated for credit. (General Education Code(s): PR-S.) The Staff

### **189. Environmental Studies Research Seminar (1 credit). F,W,S**

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. The Staff

### **190. Capstone Course: Environmental Problem Solving. S**

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(s): course 100; Entry Level Writing and Composition requirements. Enrollment restricted to senior environmental studies majors and the combined majors with Earth sciences, biology, and economics. C. Wilmers

### **191F. Community and Agroecology Seminar (2 credits).**

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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(s): course 91F, 130A, 130B, 133, or equivalent experience. Enrollment limited to 25. May be repeated for credit. The Staff

### **192. Directed Student Teaching. F,W,S**

Teaching a lower-division seminar. (See course 42.) Prerequisite(s): upper-division standing; permission of environmental studies faculty member and chairperson of department. The Staff

### **194. Teaching Environmental Studies. F,W,S**

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. The Staff

### **195A. Senior Research. F,W,S**

An individually supervised course, with emphasis on independent research that either results in a thesis or project or is done in conjunction with a senior internship. In order to receive credit, students must turn in an electronic copy of the final write-up. Satisfies the senior comprehensive requirement. Students submit

## Environmental Studies

petition to sponsoring agency.

Prerequisite(s): Entry Level Writing and Composition requirements. The Staff

### **195B. Senior Thesis Group. \***

Students involved in group or individual research that results in a senior thesis or project or done in conjunction with an internship meet regularly with their faculty sponsor to discuss the progress of their work, to receive academic and technical guidance, and to critique one another's written work. To receive credit the student must submit two bound copies of the completed research and write-up. Satisfies the senior comprehensive requirement. Students must discuss details with faculty sponsor. Students submit petition to sponsoring agency.

Prerequisite(s): Entry Level Writing and Composition requirements. The Staff

### **196. Senior Seminar. F,W,S**

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. The Staff

### **199. Tutorial. F,W,S**

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 courses 100 and 100L. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

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. May be repeated for credit. The Staff

## **GRADUATE COURSES**

### **201A. Keywords and Concepts: Geography and Ecology. F**

Exploration of keywords and concepts that underlie interdisciplinary work in environmental studies through lectures, directed readings, and discussion. Modules include resonant concepts in ecology and society; ecology and evolution; environment and development; the global environment and society; agroecology and conservation biology. (Formerly Keywords and Concepts.) Enrollment restricted to graduate students. K. Holl, A. Szasz

### **201B. Keywords and Concepts: Biogeochemistry and Environmental Policy. W**

Exploration of the keywords and concepts that underlie interdisciplinary work in environmental studies through lectures, directed readings, and discussion. Modules include resonant concepts in economics and public policy, biogeochemistry, and

global change. (Formerly Keywords and Concepts.) Enrollment restricted to graduate students. T. Duane, C. Shennan

### **201M. Developing Research Proposals (2 credits). F**

Offers graduate students the opportunity to become familiar with the research expertise of the faculty in the Environmental Studies department. Enrollment restricted to graduate students. M. Loik

### **201N. Interdisciplinary Research Design in Environmental Studies. S**

Provides students with opportunities to learn research protocols, practices, and methods used in environmental studies. Combination of lectures, reading, practical exercises, and short projects used to explore how these methods can best be incorporated into interdisciplinary research designs. Enrollment restricted to graduate students. D. Letourneau

### **210. Political Ecological Thought and Environment. S**

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. Enrollment restricted to graduate students in environmental studies. J. Bury

**215A. Geographic Information Systems and Environmental Applications. F**

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 course 115A. Concurrent enrollment in course 215L is required. Enrollment restricted to environmental studies graduates students. The Staff

**215L. Exercises in Geographic Information Systems (2 credits). F**

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 course course 115L. Students are billed a materials fee. Concurrent enrollment in course 215A is required. Enrollment restricted to environmental studies graduate students. The Staff

**220. Conservation Biology. \***

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. Enrollment restricted to environmental studies graduate students. K. Holl

**230. Agroecology and Sustainable Agriculture. W**

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. Enrollment restricted to environmental studies graduate students. D. Letourneau

**235. Social Theories of Nature. \***

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. May be repeated for credit. M. Fitzsimmons

**240. Public Policy and Conservation. \***

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. Enrollment restricted to environmental studies graduate students. T. Duane

**247. Regional Approaches to Environmental Policy. \***

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. Enrollment restricted to environmental studies graduate students. The Staff

**263. Plant Disease Ecology. \***

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 course 163. Prerequisite(s): one ecology course. Enrollment restricted to graduate students. G. Gilbert

**268. Biogeochemistry and the Global Environment. \***

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 course 168. Enrollment restricted to environmental studies graduate students. W. Cheng

**271. Valuing the Environment. \***

Intensive seminar examining the normative underpinnings of

## Environmental Studies

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. May be repeated for credit. S. Rajan

**272. Qualitative Field Methods. \*** 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. Enrollment is restricted to graduate students. J. Bury

**280. Advanced Topics in Environmental Studies. W** 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. May be repeated for credit. The Staff

**283. Environmental Studies Internship. F,W,S** 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. The Staff

**290. Interdisciplinary Research Seminar (2 credits). F,W,S** 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. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**290L. Graduate Research Seminar (2 credits). F,W,S** 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. Enrollment restricted to graduate students. K. Holl, M. Fitzsimmons

**291. Advanced Readings in Environmental Studies (3 credits). F,W,S** 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 agroecology; conservation biology; environmental policy analysis; and political economy. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**291C. Advanced Readings in Risk and Public Policy (3 credits). \*** 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 course 281C for 5 credits. Prerequisite(s): course 172 or equivalent work demonstrated by an interview. Enrollment restricted to graduate students. May be repeated for credit. S. Rajan

**291D. Advanced Readings in Tropical Ecology, Agriculture, and Development (3 credits). \*** 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. Enrollment restricted to graduate students. The Staff

**291M. Advanced Readings in Biogeochemistry (3 credits). \*** 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. Enrollment restricted to graduate students. W. Cheng

## Environmental Studies

### **291P. Advanced Readings in Environmental History and Anthropology (3 credits). \***

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. Enrollment

restricted to graduate students. S. Rajan

### **292. Topics in Research in Environmental Studies (2 credits). F,W,S**

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. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **297. Independent Study. F,W,S**

Independent study and research under faculty supervision. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **299. Thesis Research. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# FEMINIST STUDIES

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2015-16 General Catalog

416 Humanities 1

(831) 459-2461 or 459-2757

[fmst@ucsc.edu](mailto:fmst@ucsc.edu)

<http://feministstudies.ucsc.edu/>

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## PROGRAM DESCRIPTION

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Feminist studies is an interdisciplinary field of analysis 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.

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, public administration, 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. 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 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 women.

- Perform close reading of texts
- Develop an ability to formulate and defend arguments
- Develop a critical understanding of inequities, ethics, racial and gender formations, and social justice issues

### Outcome 3: Scope and Thematics

Develop a concentration in one of the areas listed below:

- Disciplinary formations and the politics of knowledge
- Culture, power and representation
- Law, politics, and social change
- Science and technology
- Sexuality studies

### Outcome 4: Feminist Methods

The lower-division classes focus on "understanding" and the upper-division courses, especially the senior seminars, focus on "application."

- Develop an understanding of feminist interdisciplinary methodology
- Apply interdisciplinary methodology to Research and Writing.

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## PROGRAM LEARNING OUTCOMES

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Students who complete the Feminist Studies major should emerge with the following skills, competencies, and knowledge:

### Outcome 1: Feminist Epistemology

- Develop a substantive understanding of feminist theories
- Develop the ability to form epistemological questions in a variety of contexts
- Be able to place divergent epistemological frameworks in dialogue

### Outcome 2: Writing, Reading, and Critical Thought

- Develop writing skills and proficiency

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## REQUIREMENTS OF THE MAJOR

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Feminist studies majors must complete 11 courses including a senior comprehensive exit requirement in the feminist studies program. Students must choose one of the following concentrations within the major: Culture, Power, and Representation; Law, Politics, and Social Change; Science, Technology, and Medicine; or Sexuality Studies. Courses appropriate for each concentration are listed at <http://feministstudies.ucsc.edu/courses/index.php>.

A proposal for an independent concentration will be approved only when a student presents a clear, coherent, and rigorous plan of study that does not fit the existing concentrations. Both the student's adviser and the Feminist Studies Department chair must approve a proposal for an independent concentration.

## Feminist Studies

Required courses include Feminist Studies 1, Feminist Studies: An Introduction; one Feminist Studies 10-, 20-, 30-, or 40-level course; Feminist Studies 100, Feminist Theories (these three core courses must be taken at UCSC); five upper-division, 5-credit courses in the concentration; two upper-division, 5-credit electives; and an upper-division exit (comprehensive) requirement course. One independent study (course 199) may count toward the concentration or toward the elective requirements. Course 193 or 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. However, feminist studies majors must take a minimum of five courses at UCSC taught directly in the Feminist Studies Department, i.e., courses designated FMST, not including course 193, 198, or 199. Two Education Abroad Program (EAP) courses may count towards the major; three transfer courses may count towards the major; and the total combined number of EAP and transfer courses that may count towards the major is a maximum of three.

Exit requirement options include a senior seminar (course 194) taught by core faculty, a senior thesis, or a senior project (course 195). Course 1, a lower-division 10-49 course, 100, and the composition (general education code C) requirement are prerequisites to course 194 and 195.

### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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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 one course: 194A, 194D, 194E, 194F, 194G, 194H, 194I, 194J, 194K, 194M, 194N, 194O, 194P, 194Q, 194T, or 195.

### HONORS

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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 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.

### LETTER GRADE REQUIREMENT

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Letter grades are required for 10 of the 11 courses applied toward the feminist studies major, including course 100 and the senior comprehensive course (194 or 195).

### TRANSFER STUDENTS

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Transfer students are encouraged to declare the major as soon as possible to be assured entrance into the required core courses. Feminist studies advisers or the chair determine which UC-transferrable courses from other institutions are acceptable. Course 1, one 10-49 lower-division course, and 100 must be completed in the junior year so that the exit requirement may be completed in the senior year.

## GRADUATE STUDIES

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### FEMINIST STUDIES PH.D.

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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.

Ph.D. students will complete most of their coursework during their first two years, including the three required courses on Feminist Theories, Feminist Methodologies, and Disciplining Knowledge (FMST 200, 201, 202). Students focus on preparing their problem-based areas of research and their dissertation prospectus during their third year. Students normally take the Ph.D. qualifying examination in their third year or early in their fourth year, when they also must demonstrate proficiency in a second language. Students write a dissertation that is approved by the dissertation committee to finish the program. Six years is the normative time toward completion of the Ph.D. degree.

### REQUIREMENTS FOR PH. D. STUDENTS BY THE END OF THE FOURTH YEAR, OR SOONER

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Ph.D. students must complete a total of 12 courses including at least 9 elective courses. In addition,

## Feminist Studies

students must enroll in three, 2-credit courses. They will satisfy their language requirement by the end of the third year, and take their qualifying examination no later than their fourth year.

- Feminist Studies requires courses 200, 201, and 202 to be taken consecutively the fall, winter, and spring quarters of the first year;
- Feminist Studies 290, Teaching Assistant Training, to be taken prior to or in conjunction with the first teaching assistant appointment;
- Twelve courses (of 5 credits each) and three 2-credit courses.
- Graduate Summer Language program or equivalent to pass the language examination.
- Qualifying examination passed and dissertation prospectus approved.
- After completion of the qualifying examination, students take courses in the 290 sequence until the dissertation is submitted.
- Students must teach three courses in feminist studies, or equivalent, as instructor or research assistant. This requirement may be waived.
- After completion of the qualifying examination (with written and oral components), students take courses in the 290 sequence until the dissertation is submitted.
- A prospectus outlining and defining the dissertation project.
- A dissertation project.

### Language Requirement

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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. 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.

### Qualifying Examination Requirements

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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. The qualifying examination 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. After advancement to candidacy, required by the end of the third year, students concentrate on dissertation writing. The current normative time to degree limit of seven years means that a student usually has at least three to four years after advancement to candidacy for completion of the dissertation. 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.

### ELECTIVE COURSES

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Students may take elective courses in feminist studies as well as in other departments. Some elective courses in the department include: Feminist Pedagogy; Black Feminisms; Feminist Science Studies; De-colonial Feminisms; Comparative Empires; Transgender and Queer Studies; and Sexuality, Race, and Migration in the Americas.

[See the [Feminist Studies web site](#) to learn more about the graduate program.]

### FEMINIST STUDIES DESIGNATED EMPHASIS

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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 <http://feministstudies.ucsc.edu>.

The following are required for the designated emphasis:

Committee composition. The student must have a designated graduate adviser from the feminist studies core or associate faculty who serves on the qualifying examination committee or in some other appropriate capacity.

## Feminist Studies

Writing. The student must prepare a significant piece of writing in the area of feminist studies. This writing must be a master's essay or a chapter of the doctoral dissertation.

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 UCSC department, as long as they are taught by core or affiliated feminist studies faculty.

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## FEMINIST STUDIES FACULTY AND PROFESSIONAL INTERESTS

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### **Felicity Amaya Schaeffer, Associate Professor of Feminist Studies**

Transnational feminisms; sexuality and migration, technology, and race; intimacy and globalization; Latin American/Latino studies; border studies; Chicana/o studies; biometrics and security studies

### **Bettina Aptheker, Professor of Feminist Studies and History**

Feminist oral history and memoir; feminist pedagogy; African American feminist history; queer studies; feminist Jewish studies; feminist critical race studies

### **Anjali Arondekar, Associate Professor of Feminist Studies**

South Asian studies, colonial historiography; feminist theories; queer theory; critical race studies; 19th-century interdisciplinary studies

### **Neda Atanasoski, Associate Professor of Feminist Studies**

New media and film; critical race and ethnic studies; feminist theory; human rights and humanitarianism; war and nationalism; religion and secularism; post-socialist politics and culture in Central and Eastern Europe

### **Karen Barad, Professor of Feminist Studies, History of Consciousness, and Philosophy**

Feminist science studies, materialism, deconstruction, poststructuralism, posthumanism, multi-species studies, science and justice, physics, 20th-century continental philosophy, epistemology, ontology, ethics, philosophy of physics, feminist, queer, and trans theories

### **Gina Dent, Associate Professor of Feminist Studies, History of Consciousness, and Legal Studies**

Africana literary and cultural studies, legal theory, popular culture

### **Margaret M. Downes-Baskin, Research Associate in Feminist Studies**

Presidential leadership styles, elections and the media, women's political and corporate leadership style, intergenerational relations

### **Kristina Lyons, Assistant Professor in Feminist Studies**

Feminist and decolonial science studies, environmental humanities of the global South, politics of "nature" and "matter," ethnographic theory, literary ethnography and poetics, politics and the political in Latin America, socioenvironmental justice and ethics

### **Nick Mitchell, Assistant Professor**

Black feminist thought and praxis; critical theory; critical university studies; epistemology and discipline formation; feminist theory; intellectual history

### **Madhavi Murty, Assistant Professor**

Post-reform India and political economy, neoliberalism and nationalism, popular culture in South Asia, media studies, cultural studies, Black cultural studies and transnational race

### **Marcia Ochoa, Associate Professor of Feminist Studies**

Gender and sexuality, race and ethnicity, Latina/o studies, media and cultural studies, ethnography of media, feminism, queer theory, geography, multimedia production, graphic design, colonialism and modernity, Latin American studies—Colombia and Venezuela, social documentation



### **Angela Y. Davis, Emerita, Professor of History of Consciousness and Feminist Studies**

Feminism, African American studies, critical theory, popular music culture and social consciousness, philosophy of punishment (women's jails and prisons)

### **Rosa Linda Fregoso, Professor Emerita of Latin American and Latino Studies**

### **Jody Greene, Professor of Literature**

Seventeenth- and 18th-century British literature and culture; pre- and early modern studies; critical theory, especially Derrida; poststructuralism and ethics; gender studies; history of authorship; history of the book; human property

**Donna J. Haraway, Emerita, Professor of History of Consciousness and Feminist Studies**

Feminist theory, cultural and historical studies of science and technology, relation of life and human sciences, human-animal relations, and animal studies

**Helene Moglen, Emerita, Professor of Literature**

The English novel; feminist, critical, cultural, and psychoanalytic theory; gender and genre in social and psychological contexts

**Affiliated Faculty**

**Gabriela Arredondo, Associate Professor of Latin American and Latino Studies**

U.S. social and cultural history; Chicana/o history; critical race and ethnicity theories; im/migration history; Latina/os in the U.S.; Chicana feminisms; "borderlands" studies, modern Mexico history

**Lora Bartlett, Associate Professor of Education**

Educational policy and school reform, schools as workplaces for teachers, the conditions of teachers' commitment

**Karen Bassi, Professor of Classics (Literature)**

Greek and Latin literatures; gender; literary and cultural theory; pre- and early modern studies; tragedy; historiography; visual and performance studies; death studies

**Julie Bettie, Associate Professor of Sociology**

Cultural theory and popular culture; race, gender, class, and cultural politics; sexuality and sex work; critical qualitative methodologies

**Heather Bullock, Professor of Psychology**

Social class, poverty and economic inequality, welfare policy, feminist psychology, discrimination

**Julianne Burton-Carvajal, Emerita, Professor of Literature**

American visual media, particularly film; melodrama as a transnational form; gender and authorship; history, cultures, and representations of California, particularly the Central Coast

**Nancy N. Chen, Professor of Anthropology**

Medical anthropology, visual anthropology, urban anthropology, Asian American identity, mental health, food, China

**Vilashini Cooppan, Associate Professor of Literature**

Postcolonial studies, comparative and world literature, literatures of slavery and diaspora, globalization studies, cultural theory of race and ethnicity

**Faye J. Crosby, Professor of Psychology**

Gender; social identity; and social justice, especially affirmative action

**Cynthia Cruz, Assistant Professor of Education**

Street ethnography; community-based learning and pedagogies; decolonial feminist pedagogies; Chicana studies and epistemologies; U.S.-Third World Feminisms; cultural studies and education

**Teresa de Lauretis, Emerita, Professor of History of Consciousness**

Semiotics, psychoanalysis, feminism, film theory, literary theory, queer studies

**Sylvanna Falcón, Assistant Professor of Latin American and Latino Studies**

Human rights, racism/antiracism, globalization, gender, transnational feminism, Latin America (Mexico, Peru), United States

**Mayanthi Fernando, Associate Professor of Anthropology**

Religion and secularism; anthropology of Islam; gender and sexuality; multiculturalism/pluralism; modernity and its "Others"; ethnography and ethics; colonial and post-colonial France/Europe; theory and methods in the study of religion

**Dana Frank, Professor of History**

Late 19th- and 20th-century U.S. social history, including women's, labor, and working-class history, race and ethnicity; modern Honduras; U.S. history in transnational perspective

**Marge Frantz, Professor Emerita, Lecturer in American Studies and Feminist Studies**

**Carla Freccero, Professor and Chair of Literature, History of Consciousness; Professor of Feminist Studies**

Renaissance studies; French and Italian language and literature; early modern studies; postcolonial theories and literature; contemporary feminist theories and politics; queer theory; U.S. popular culture; posthumanism; animal studies

**Pascale Gaitet, Emerita, Professor of Literature and Language Studies**

Nineteenth- and 20th-century French literature, sociolinguistics, political history, Celine, Genet

**Mary-Kay Gamel, Emerita, Professor of Classics and Comparative Literature**

Performance studies, ancient Mediterranean performance, Greek and Latin literatures, myth, reception of Greek and Roman texts and artifacts, film, feminist approaches to literature and performance

**Diane Gifford-Gonzalez, Professor of Anthropology**

Paleolithic and Neolithic Africa and Eurasia, colonial New Mexico, origins of food production, pastoralists, zooarchaeology, history of archaeology, interpretive theory, visual anthropology

**Susan Gillman, Professor of American Literature**

Transnational American studies; literatures of the 19th-century Americas; critical race studies; translation theory; comparative history of slavery and emancipation; world literature and cultural studies

**Jennifer A. González, Professor of History of Art and Visual Culture**

Contemporary theories of visual culture, semiotics, critical museum studies, photography, public and activist art in the U.S.

**June Gordon, Professor of Education**

Urban education; international comparative education; the impact of economics, culture and politics on educational attitudes and expectations of immigrants; marginalized youth; schooling and society in Japan, China, India, the U.K., and the U.S.A.; sociology of education

**Deborah Gould, Associate Professor of Sociology**

Political emotion; social movements and contentious politics; classic and contemporary social theory; sexualities; lesbian/gay/queer studies; feminist and queer theory

**Shelly A. Grabe, Associate Professor of Psychology**

Cultural objectification of women and women's bodies as a pervasive global phenomenon played out in different ways across different cultures; how "embodied oppression" affects women's psychological well-being and empowerment

**Herman Gray, Professor of Sociology**

Cultural studies, media and television studies, black cultural politics, social theory

**Irene Gustafson, Associate Professor of Film and Digital Media**

Producing across the boundaries between "theory" and "practice," non-fiction, gender and queer studies, production design

**Julie Guthman, Professor of Community Studies**

Sustainable agriculture and alternative food movements, international political economy of food and agriculture, politics of obesity, political ecology, race and food, critical human geography

**Lisbeth Haas, Professor of Feminist Studies, and Professor of History**

U.S.-Mexico borderlands and border studies; Chicano and Native American history; visual culture in the colonial Americas; California; historical memory, theory, and historical methodology

**Margo Hendricks, Emerita, Professor of Literature**

Early modern English literature and culture; theories and discourses of race, gender, drama, and theory; women playwrights; pre- and early modern studies

**Gail B. Hershatter, Professor of History**

Modern Chinese social and cultural history; labor history; gender history; history of sexuality; feminist theory; history, memory, and nostalgia

**Emily Honig, Professor of History**

Gender, sexuality, and ethnicity in modern Chinese history; comparative labor history; Chicana history, nationalism, and sexuality in the Third World; oral history

**Jocelyn Hoy, Lecturer in Philosophy**

Feminist philosophy, 19th- and 20th-century continental philosophy

**Akasha Hull, Emerita, Professor of Feminist Studies and Literature**

**Donna Hunter, Associate Professor Emerita of History of Art and Visual Culture**

European painting (especially French) from 1600 to the 1960s; German art and visual culture between the two world wars; art as social practice, portraiture

**Aida Hurtado, Professor of Psychology**

Social identity, feminist theory, social psychology of education, survey methodology

**Stacy Kamehiro, Associate Professor of History of Art and Visual Culture**

Visual cultures of the Pacific, 19th-century Hawai'i, (inter)nationalism, culture contact; (post)colonialism

**L. S. Kim, Associate Professor of Film and Digital Media**

Television history and theory, racial discourse, feminist criticism, Asian-American media production, industrial practices and social change in both mainstream Hollywood and alternative media

**Norma Klahn, Emerita, Professor of Literature**

Latin American literary and cultural studies (specialization: Mexico); Chicano/Latino literature and culture from a cross-border perspective; modernity/postmodernity; poetics and politics; genre theory (novel, poetry, autobiography); critical theory (i.e., border, ethnic, feminist, transnational/global)

**Campbell Leaper, Professor of Psychology**

The developmental and social psychology of gender in childhood, adolescence, and adulthood; self-concept and social identity; language and social interaction; social relationships, academic achievement; media; perceptions and consequences of sexism

**Peter Limbrick, Associate Professor of Film and Digital Media**

International cinemas, especially Arab and Middle Eastern cinemas and Australasian cinemas; postcolonial theories and settler colonialism; theories of globalization and transnationalism; intersections of

## Feminist Studies

race, gender, and sexuality; queer theory; film and video history and historiography

### **Jennie Lind McDade, Professor of Art**

Drawing, painting

### **Carolyn Martin Shaw, Emerita, Professor of Anthropology**

African societies, colonial discourse, social theory, anthropology of women, sexuality

### **Lourdes Martínez-Echazábal, Professor of Latin American and Latino Studies**

Latin American and Caribbean literatures; Afro-Latin American literatures, cultures, and societies; found[n]ational narratives; Brazilian literature; literatures of Cuba and the Cuban diaspora; critical race theory

### **Tanya Merchant, Associate Professor of Music**

Ethnomusicology, musics of Central Asia and the former Soviet Union, music and gender, identity, nationalism, globalization, and the institutionalization of music

### **Leta E. Miller, Professor of Music**

Renaissance and baroque music history and performance practices, 20th-century American music, modern and baroque flute, 16th-century chanson and madrigal, music and science, 18th- and 20th-century flute literature and performance styles, music of C.P.E. Bach and Lou Harrison

### **Megan Moodie, Assistant Professor of Anthropology**

South Asian studies, feminist theory, reproductive and population politics, kinship, development, legal identities, tribal communities

### **Margaret Morse, Emerita, Professor of Film and Digital Media**

Digital and electronic media theory and criticism, media art, media history, technology and culture, film history and theory, German cinema, documentary and science fiction

### **Catherine Ramirez, Associate Professor of Latin American and Latino Studies**

United States cultural history, with a focus on immigration and assimilation; theories of citizenship; Latino literature; comparative ethnic studies; feminist and gender studies; cultural studies

### **Jennifer E. Reardon, Professor of Sociology**

Issues of social identity as influenced by the new sciences of genetics and genomics; intersection of the sociology of science and knowledge and the sociology of race, gender, and class

### **B. Ruby Rich, Professor of Social Documentation and Film and Digital Media**

Documentary film and video, post-9/11 culture, new queer cinema, feminist film history, Latin American and

Latin/a cinema, U.S. independent film and video, the essay film, the politics of film festival proliferation and the marketing of foreign films in the U.S.

### **Cecilia Rivas, Associate Professor of Latin American and Latino Studies**

Transnationalism; media and communication (Internet, newspapers); migration; globalization; race, ethnicity, and gender; bilingualism; consumption; El Salvador, Central America, Southern Mexico

### **Pamela Ann Roby, Emerita, Professor of Sociology**

Sociology of learning, women and work, leadership and social change, sociology of emotions, feminist research, inequality and social policy

### **Lisa Rofel, Professor of Anthropology**

Critical theory, anthropology of modernity, popular/public culture, gender and sexuality, cultures of capitalism, postcolonial feminist anthropology, China

### **Vanita Seth, Associate Professor of Politics**

Early modern and modern political theory, feminist theory, cultural history, race politics, postcolonial theory

### **Deanna Shemek, Professor of Literature**

Renaissance Italian literature and culture; early modern feminism; humanism; letter-writing and epistolary culture; early modern literacy and media; Renaissance theater; the northern court circles; digital humanities

### **Mary W. Silver, Emerita, Professor of Ocean Sciences**

**Shelley Stamp, Professor of Film and Digital Media**  
Film history, theory, and criticism; silent cinema; early Hollywood; women's filmmaking; film censorship; histories of moviegoing; feminist approaches to cinema

### **Elizabeth Stephens, Professor of Art**

Intermedia, electronic art, sculpture, and performance art

### **Nancy Stoller, Emerita, Professor of Community Studies**

Race and gender aspects of health, the AIDS epidemic, community organizing, sexualities, and medicine in prisons

### **Avril Thorne, Professor of Psychology**

Identity development through personal memory telling, development of meaning in adolescents' self-defining memory narratives, family storytelling and the development of a sense of self, narrative co-construction of identity and intimacy

### **Nina K. Treadwell, Associate Professor of Music**

Renaissance through early baroque music history and performance practices, early plucked-string instruments (theorbo, renaissance, and baroque guitar; renaissance lute), 16th- and 17th-century Italian

## Feminist Studies

theatrical music, gender studies, women and music, literary and critical theory

### **Anna Tsing, Professor of Anthropology**

Culture and politics; feminist theory; globalization; multi-species anthropology; social landscapes and tropical forest ethnologies; multi-sited ethnography; Indonesia, Southeast Asia, and the U.S.

### **Candace West, Professor of Sociology**

Language and social interaction, sociology of gender, conversation analysis, microanalysis and medicine

### **Marilyn J. Westerkamp, Professor of History**

Colonial and revolutionary America; the Atlantic World; early modern cultural and religious history; U.S. religious history; gender studies; history of the body

### **Rob Wilson, Professor of Literature**

Transnational and postcolonial literatures, especially as located and transformed in Asia/Pacific; cultural-political emergences as posited against empires of globalization; cultural poetics of America in the Pacific and Oceania; the sublime, Longinus to Hiroshima; poetics of experimental writing, especially poetry; the poetry and cultural poetics of Bob Dylan; Beat beatitude, social and literary, from Jesus to Juliana

Spahr et al; San Francisco as Global City, with its literature read as archive of vision and critique; Pacific Rim cities from Hong Kong and Seoul to Taipei, Kaohsiung, Shanghai, Honolulu, San Francisco, and Los Angeles

### **Alice Yang, Associate Professor of History**

Historical memory, Asian American history, gender history, race and ethnicity, 20th-century U.S., oral history

### **Patricia Zavella, Professor of Latin American and Latino Studies**

Relationship between women's work and domestic labor, poverty, family, sexuality and social networks, feminist studies, ethnographic research methods, and transnational migration of Mexicana/o workers and U.S. capital

### **Eileen Zurbriggen, Professor of Psychology**

Connections between power and sex; sexual aggression and abuse; trauma; sexual decision-making; sexuality and media, the sexualization of girls and women; power in romantic relationships; adolescent sexual development; authoritarianism; feminist political psychology; quantitative methods in social psychology

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## FEMINIST STUDIES COURSES

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### LOWER-DIVISION COURSES

#### **1. Feminist Studies: An Introduction. W**

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. (Formerly Introduction to Feminisms.) (General Education Code(s): CC, IH.) M. Ochoa

#### **10. Feminisms of/and the Global South. W**

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. (Formerly course 80F.) (General Education Code(s): CC, T5-Humanities and Arts or Social Sciences, E.) A. Arondekar

#### **14. Popular Culture in South Asia. S**

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. (General Education Code(s): IM.) M. Murty

#### **16. Media Histories--News and New Media. \***

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. (General Education Code(s): IM.) M. Murty

#### **20. Feminism and Social Justice. F**

Examines, and critically analyzes, select post-World War II movements for social justice in the United States from feminist

## Feminist Studies

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. (Formerly course 80A.) (General Education Code(s): ER, T5-Humanities and Arts or Social Sciences.) B. Aptheker

### **21. Religion in American Politics and Culture. \***

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. (Formerly course 80T.) (General Education Code(s): IM.) M. Fernando, N. Atanasoski

### **30. Feminism and Science. W**

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. (Formerly course 80K.) Enrollment limited to 80. (General Education Code(s): PE-T, T5-Humanities and Arts or Social Sciences.) K. Barad

### **40. Sexuality and Globalization. \***

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. (Formerly course 80B.) (General Education Code(s): CC, T5-Humanities and Arts or Social Sciences.) F. Schaeffer-Grabel

### **41. Trans Gender Bodies. \***

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. (Formerly course 80M.) M. Ochoa

### **80S. Women in Music. F**

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. (Also offered as Music 80S. Students cannot receive credit for both courses.) Offered in alternate academic years. (General Education Code(s): CC, T4-Humanities and Arts, A.) T. Merchant

## **UPPER-DIVISION COURSES**

### **100. Feminist Theories. S**

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. Enrollment restricted to sophomores, juniors, and seniors. A. Arondekar

### **102. Feminist Critical Race Studies. \***

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(s): one course from feminist studies. Enrollment restricted to juniors and seniors. Enrollment limited to 20. (General Education Code(s): E.) The Staff

### **112. Women and the Law. \***

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. (Also offered as Politics 112. Students cannot receive credit for both courses.) Enrollment restricted to feminist studies, politics, legal studies, and Latin American and Latino studies/politics combined majors during priority enrollment only. G. Dent

### **115. Gender, Sexuality, and Transnational Migration Across the Americas. F**

Examines migration as a mode of inquiry into transnational practices across geographic locales and

## Feminist Studies

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(s): course 1, 100, or 145. Enrollment restricted to sophomores, juniors, and seniors. (General Education Code(s): ER, E.) F. Schaeffer-Grabiel

**120. Transnational Feminisms. \***  
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(s): course 1. Enrollment restricted to sophomores, juniors, and seniors. Enrollment limited to 40. (General Education Code(s): CC, E.) F. Schaeffer-Grabiel

**123. Feminism and Cultural Production. \***  
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(s): course 1. Enrollment restricted to sophomores, juniors, and seniors. May be repeated for credit. (General Education Code(s): A, E.) V. Cooppan, J. Gonzalez

**124. Technology, Science, and Race Across the Americas. F**  
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. Enrollment restricted to sophomore, junior, and senior feminist studies majors during priority enrollment only. Enrollment limited to 25. (General Education Code(s): PE-T, E.) F. Schaeffer-Grabiel

**125. Race, Sex, and Technology. \***  
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. N. Atanasoski, F. Schaeffer-Grabiel

**126. Images, Power, and Politics: Methods in Visual and Textual Analysis. \***  
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. Enrollment restricted to sophomore, junior, and senior feminist studies majors during priority enrollment only. Enrollment limited to 25. (General Education Code(s): IM.) N. Atanasoski

**131. The Politics of Matter and the Matter of Politics. F**  
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(s): course 1. K. Lyons

**132. Gender and Postcoloniality. W**  
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. Enrollment restricted to juniors and seniors. Enrollment limited to 20. (General Education Code(s): E.) A. Arondekar

**133. Science and the Body. S**  
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(s): courses 1 and 100. Enrollment restricted to juniors and seniors. (General Education Code(s): PE-T.) K. Barad

**135. Topics in Science and Sexuality. \***  
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

## Feminist Studies

and geopolitical locations. Prerequisite(s): course 100 or 145. Enrollment restricted to sophomores, juniors, and seniors. Enrollment limited to 25. May be repeated for credit. A. Arondekar

### **139. African American Women's History. S**

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. Enrollment restricted to sophomores, juniors, and seniors. (General Education Code(s): ER, E.) B. Aptheker

### **145. Racial and Gender Formations in the U.S. \***

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. (General Education Code(s): ER, E.) F. Schaeffer-Grabiel

### **148. Gender and Global Development. \***

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.) (Also

offered as Anthropology 148. Students cannot receive credit for both courses.) M. Moodie

### **150. Mediating Desire. \***

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. (Formerly Community Studies 152) Enrollment restricted to sophomore, junior, and senior feminist studies majors or by permission of instructor. (General Education Code(s): ER, E.) M. Ochoa

### **168. Topics in Feminist Philosophy. \***

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. (Also offered as Philosophy 147. Students cannot receive credit for both courses.) Prerequisite(s): Philosophy 100A or 100B or 100C. J. Hoy

### **175. Gender and Sexualities in Latina/o America. \***

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. (Formerly, Gender and Sexuality in Latin America.) Enrollment

restricted to sophomore, junior, and senior feminist studies majors or by permission of instructor. (General Education Code(s): CC, E.) M. Ochoa

### **189. Advanced Topics in Feminist Theory. \***

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(s): course 100. Enrollment restricted to juniors, seniors, and graduate students. Enrollment limited to 20. May be repeated for credit. The Staff

### **193. Field Study. F,W,S**

Individual field study in the vicinity of the campus under the direct supervision of a faculty sponsor. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **193F. Field Study (2 credits). F,W,S**

Individual field study in the vicinity of the campus under the direct supervision of a faculty sponsor. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **194. Senior Seminar.**

Discussion classes providing a broad overview of some general "area of concentration." Discussion of assigned readings, focus on oral presentations, and a final 20- to 25-page paper. Satisfies the senior comprehensive requirement in feminist studies. Enrollment limited to 20. The Staff

**194A. Feminist Jurisprudence. \***

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. Instructor permission required to enroll. Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements; course 112 or Politics 112. Enrollment restricted to senior feminist studies majors. Enrollment limited to 20. G. Dent

**194D. Feminist Science Studies. \***

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(s): satisfaction of Entry Level Writing and Composition requirements; and courses 1 and 100. Enrollment restricted to senior feminist studies majors. Enrollment limited to 20. K. Barad

**194F. Chicana/Latina Cultural Production. \***

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(s): satisfaction of Entry Level Writing and Composition requirements; course 100. Enrollment restricted to senior feminist study majors. Enrollment limited to 20. (General Education Code(s): E.) F. Schaeffer-Grabel

**194G. Images of Africa. \***

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(s): satisfaction of Entry Level Writing and Composition requirements; course 100; enrollment restricted to seniors. Enrollment by permission of instructor. Enrollment limited to 20. G. Dent

**194H. Michel Foucault: An Introduction. \***

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(s): courses 1 and 100; and satisfaction of Entry Level Writing and Composition requirements. Enrollment restricted to juniors, seniors, and graduate feminist studies majors. Enrollment limited to 20. A. Arondekar

**194I. Feminist Oral History and Memoir. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements; course 100. Enrollment restricted to senior feminist studies majors. Enrollment limited to 20. (General Education Code(s): W.) B. Aptheker

**194K. Black Diaspora. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements; course 100. Enrollment restricted to senior feminist studies majors. Enrollment limited to 15. G. Dent

**194N. Gender, Class, and Sex in Shanghai. \***

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. (Also offered as History 194A. Students cannot receive credit for both courses.) Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements; and History 40B, 140C, 140D, or 140E, or permission of instructor.

## Feminist Studies

Restricted to junior and senior feminist studies majors. Enrollment limited to 20. (General Education Code(s): W.) E. Honig

### **1940. The Politics of Gender and Human Rights. W**

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(s): satisfaction of Entry Level Writing and Composition requirements; courses 1 and 100. Enrollment restricted to senior feminist studies majors. Enrollment limited to 20. N. Atanasoski

### **194Q. Queer Diasporas. \***

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(s): course 100 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 20. M. Ochoa

### **194T. Transgender Studies. \***

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(s): satisfaction of Entry Level Writing and Composition requirements. Enrollment restricted to senior feminist studies majors. Enrollment limited to 20. M. Ochoa

### **195. Senior Thesis or Project. F,W,S**

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. May be repeated for credit. (General Education Code(s): W.) The Staff

### **198. Independent Field Study. F,W,S**

Provides for individual study program off campus for which faculty supervision is not in person. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **198F. Independent Field Study (2 credits). F,W,S**

Provides for individual study program off campus for which faculty supervision is not in person. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

Individual directed study for upper-division undergraduates. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

Individual directed study for upper-division undergraduates. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## GRADUATE COURSES

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### **200. Feminist Theories. F**

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. Enrollment restricted to graduate students. Enrollment limited to 15. F. Schaeffer-Grabel

### **201. Topics in Feminist Methodologies. W**

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. Enrollment restricted to graduate students. Enrollment limited to 15. May be repeated for credit. A. Arondekar

### **202. Disciplining Knowledge/Graduate Research. S**

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(s): course 200 and course 201. Enrollment restricted to graduate students. Enrollment limited to 15. K. Barad

### **203. Feminist Pedagogies. F**

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. Enrollment restricted to graduate students. Enrollment limited to 15. B. Aptheker

**204. Ways of Seeing and Hearing. F**

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. (Also offered as Social Documentation 204. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. M. Ochoa

**207. Topics in Queer/Race Studies. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. A. Arondekar

**211. Sexuality, Race, and Migration in the Americas. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. F. Schaeffer-Grabel

**212. Feminist Theory and the Law. \***

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. (Also offered as History of Consciousness 212. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. Enrollment limited to 15. G. Dent

**214. Topics in Feminist Science Studies. S**

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. Enrollment restricted to graduate students. Enrollment limited to 15. K. Barad

**215. Postcolonial and Postsocialist Transactional Analytics. F**

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.) Enrollment restricted to graduate students. Enrollment limited to 15. N. Atanasoski

**216. Archives/Genders/Histories: An Introduction. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. A. Arondekar

**222. Religion, Feminism, and Sexual Politics. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. N. Atanasoski

**232. Topics in Postcolonial Studies. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. A. Arondekar

**240. Culture and Politics of Human Rights. \***

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. (Also offered as Latin American&Latino Studies 240. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. R. Fregoso

**245. Race and Representation. \***

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. (Also offered as History of Consciousness 245. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. J. Gonzalez

**251. Feminist Theory and Social Psychology. \***

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. (Also offered as Psychology 251. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. The Staff

**260. Black Feminist Reconstruction. \***

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. Enrollment restricted to graduate students Enrollment limited to 15. B. Aptheker

**264. The Idea of Africa. \***

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. (Also offered as History of Consciousness 264. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. Enrollment limited to 15. G. Dent

**268A. Science and Justice: Experiments in Collaboration. \***

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 by permission of instructor. Enrollment restricted to graduate students. (Also offered as Anthropology 267A. Students cannot receive credit for both courses.) Enrollment limited to 15. J. Reardon, K. Barad

**268B. Science and Justice Research Seminar. \***

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): Sociology 268A, Biomolecular Engineering 268A, Feminist Studies 268A, or Anthropology 267A. Enrollment by permission of instructor. Enrollment restricted to graduate students. (Also offered as Anthropology 267B. Students cannot receive credit for both courses.) Enrollment limited to 15. J. Reardon, K. Barad

**297. Independent Study. F,W,S**

Independent study and research under faculty supervision. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**297A. Independent Study. F,W,S**

Independent study and research under faculty supervision. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**297B. Independent Study (10 credits). F,W,S**

Independent study and research under faculty supervision. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**297F. Independent Study (2 credits). F,W,S**

Independent study and research under faculty supervision. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

Feminist Studies

**299. Thesis Research. F,W,S**

Enrollment restricted to students who have advanced to candidacy. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**299A. Thesis Research. F,W,S**

Prerequisite(s): advancement to candidacy. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**299B. Thesis Research (10 credits). F,W,S**

Prerequisite(s): advancement to candidacy. Enrollment restricted to graduate students. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# FILM AND DIGITAL MEDIA

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2015-16 General Catalog

101 Communications Building

(831) 459-3204

[film@ucsc.edu](mailto:film@ucsc.edu)

<http://film.ucsc.edu>

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## PROGRAM DESCRIPTION

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The film and digital media major at UCSC offers an integrated curriculum involving theory, criticism, and cultural analysis, as well as a production program in the aesthetics and techniques of film and digital media. This bachelor of arts degree program provides students with the critical skills, theoretical concepts, and historical knowledge necessary to conduct informed analysis of cinema, television, video art, and new media, along with the up-to-date technical knowledge, practical skills, and artistic contexts needed for the production of film, video, and digital media. The major provides a course of study that develops an understanding of moving image and digital media as essential tools of communication and artistic practice.

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. Students in the production concentration are encouraged to demonstrate technical proficiency and creative vision in film and digital media production while also studying the histories and theories of these media. The integrated critical practice concentration will serve students currently enrolled in the major 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. The UCSC program is interdisciplinary, combining theory and practice in film, video, and digital media with study in other areas of the

arts, humanities, and social sciences that help students understand the role these media play in society.

As the technologies of film and video have merged with digital computer-based moving images and interactive media, and as digital media continues to expand into everyday experience, students in the major are uniquely positioned to excel in these fields. Graduates of the UCSC film and digital media program have enjoyed considerable success both in the professional world and in gaining admission into top graduate schools in the field.

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; 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. Admission to advanced production courses is generally restricted to third- and fourth-year students and is based on the submission of a portfolio of work produced in the introductory production class (FILM 170B for film production pathway, FILM 170A for digital media pathway) and other production workshops.

Upper-division digital media and production studio courses require coursework to be completed on

## Film and Digital Media

computers. Instruction in and software for production courses utilizes the Apple OX 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 at [slugfilm.ucsc.edu](http://slugfilm.ucsc.edu).

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### DECLARATION OF THE FILM AND DIGITAL MEDIA PRE-MAJOR

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Students who have completed one lower-division course (20A, 20B or 20C) with a grade of C or better may declare the film and digital media pre-major. Pre-majors are expected to complete the requirements to declare the major by the end of their second year. Transfer students must declare the pre-major no later than their second quarter in residence.

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### DECLARATION OF THE FILM AND DIGITAL MEDIA MAJOR

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Prior to declaring the film and digital media major, students must pass FILM 20A, and either 20B or 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 need to complete the lower-division courses early in their studies so that the petition to major status is accomplished before the first quarter of the junior year. Acceptance into the film and digital media major does not constitute acceptance into any of the concentrations (production, critical studies, or integrated critical practice). Transfer students should consult the Transfer Student section for instructions about declaring the major.

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### UNDERGRADUATE PROGRAM LEARNING OUTCOMES

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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.

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### REQUIREMENTS OF THE MAJOR

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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; underrepresented ethnicity, gender, or sexual orientation). 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), the production concentration (see Production Concentration below), or the more rigorous integrated critical practice concentration (see Integrated Critical Practice Concentration below) within the major.

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#### LOWER-DIVISION REQUIREMENTS

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20A Introduction to Film Studies

Two additional 20-level courses:

20B Introduction to Television Studies

20C Introduction to Digital Media

20P Introduction to Production Technique (cannot be used toward declaring the major)

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### GENERAL FILM AND DIGITAL MEDIA MAJOR

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

120 Introduction to Film Theory and Criticism

One course from each of the following four groups:

## Film and Digital Media

- 130 Silent Cinema
- 132A International Cinema to 1960
- 132B International Cinema, 1960 to Present
- 134A American Film, 1930–60
- 134B American Film, 1960–Present
- 136A Experimental Film and Video
- 136B History of Television
- 136C Visual Culture and Technology: History of New Media
- 136D Documentary Film and Video
- 194A Film Theory Seminar
- 194B Electronic Media Theory Seminar
- 194C New Media Theory Seminar
- 194D Film History Seminar
- 194E International Cinemas
- 194F Film and the Other Arts: Music and Dance
- 194G New(s) Media
- 194S Senior Seminar: Special Topics

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

- up to five additional upper-division history/critical studies courses in film and digital media
- up to two upper-division courses in film and digital media production (150, 151, 170A, 170B, one from the 171 series, 172, 173, 175, 176, 177, or one from the 178 series)
- 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

### FILM AND DIGITAL MEDIA MAJOR PLANNERS

The following are two recommended academic plans for students to complete during their first two years as preparation for the film and digital media major. Plan One is a guideline for students who are committed to the major early in their academic career; Plan Two is for students who are considering the major.

Students who are interested in the production concentration, the critical studies concentration, or the integrated critical practice concentration should consider Plan One to be better prepared for application to production studio classes or either the critical studies concentration or the integrated critical practice concentration 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.

<b>Plan One</b>			
<b>Year</b>	<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
1st (frsh)	FILM 20A	low-div FILM req	low-div FILM req
	college core	gen ed	gen ed
	gen ed	(declare pre-major)	(declare major)
2nd (soph)	FILM critical studies core	FILM 120	FILM critical studies core
	FILM elective	FILM elective	FILM elective
	gen ed	gen ed	gen ed

<b>Plan Two</b>			
<b>Year</b>	<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
1st (frsh)	FILM 80A or 80M	low-div FILM req	low-div FILM req
	college core	gen ed	gen ed
	gen ed		(declare pre- major)
2nd (soph)	FILM 20A	FILM 120	FILM critical studies core
	gen ed	FILM elective	FILM elective
	(declare major)	gen ed	gen ed

### CRITICAL STUDIES CONCENTRATION

The critical studies concentration provides a more rigorous pathway through the film and digital media 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 FILM 120 and at least three other upper-division critical studies classes. Applicants must already be declared film and digital media majors in good standing.

Students will be asked to submit the following application materials:

- a completed application form
- a one-page statement of purpose
- a sample essay

## Film and Digital Media

- a FDM faculty statement of support (submitted directly to the department)
- copies of all narrative evaluations provided by instructors of film and digital media courses

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.

### Requirements for the Critical Studies Concentration

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The critical studies concentration curriculum adds the following requirements to those already established for the film and digital media major. Students are required to take two upper-division electives, rather than the five electives currently required for the film and digital media major. Students complete their senior comprehensive requirement by taking FILM 194A, Film Theory Seminar; FILM 199, Tutorial; and either FILM 192, Student-Directed Seminar or FILM 195, Senior Thesis.

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

120 Introduction to Film Theory and Criticism

One course from each of the following five groups:

130 Silent Cinema

132A International Cinema to 1960

132B International Cinema, 1960 to Present

134A American Film, 1930–60

134B American Film, 1960–Present

136A Experimental Film and Video

136B History of Television

136C Visual Culture and Technology: History of New Media

136D Documentary Film and Video

165A Film, Video and Gender

165B Race on Screen

165C Lesbian, Gay and Queer Film and Video

165D Asian Americans in Media

187 Advanced Topics in Television Studies

189 Advanced Topics in Electronic and Digital Media Studies

Three courses to satisfy the senior comprehensive requirement:

194A Film Theory Seminar

199 Tutorial (supervised independent study for thesis or student-directed seminar preparation)

192 Student-Directed Seminar or

195 Senior Thesis

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

- up to two additional upper-division history/critical studies courses in film and digital media
- one upper-division course in film and digital media production (150, 151, 170A, 170B, one from the 171 series, 172, 173, 175, 176, 177, or one from the 178 series)
- one upper-division course offered by other departments; course substitutions must be pre-approved by the Film and Digital Media Department

### PRODUCTION CONCENTRATION

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Admission to the production concentration is selective, based on promise and accomplishment shown in the student's work. After completing FILM 170B (prerequisite for most film/video production courses) students may apply to the production concentration. Students who complete FILM 170A (prerequisite for most digital media production courses) with a B or better are also eligible to pursue the production concentration though they will aim to fulfill the requirements with digital media production courses and other production courses that do not require the FILM 170B prerequisite.

FILM 170B students apply by submitting works created in 170B to a portfolio review conducted at the end of each quarter. These student works are reviewed by a committee of film and digital media production faculty. Instructions for the portfolio review are available at the Film and Digital Media Department office. Students should note that production courses are in high demand and that faculty/student ratios and equipment resources limit the number of applicants accepted into the production concentration. Students may reapply a second time if not accepted.

FILM 170A students who complete the course with a B or better apply by submitting a statement of intent to pursue the digital media pathway in production. Students are required to meet with the undergraduate adviser to discuss their digital media plan prior to submitting their statement of intent.

If a student accepted into the production concentration is unable to meet all the requirements for the concentration, they will be advised to complete the graduation requirements for the general major. Application materials and instructions for all

## Film and Digital Media

production courses are available each quarter online at [https://slugfilm.ucsc.edu/secure/production\\_applications](https://slugfilm.ucsc.edu/secure/production_applications).

### Requirements for the Production Concentration

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

- 120 Introduction to Film Theory and Criticism
- 170A Fundamentals of Digital Media Production (prerequisite for most digital media production courses) or
- 170B Fundamentals of Film and Video Production (prerequisite for most film/video production courses)

Two upper-division production courses from the following:

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

Two critical studies courses taken from two of the three following groups:

- 130 Silent Cinema
- 132A International Cinema to 1960
- 132B International Cinema, 1960 to Present
- 134A American Film, 1930–60
- 134B American Film, 1960–Present
- 136A Experimental Film and Video
- 136B History of Television
- 136C Visual Culture and Technology: History of New Media
- 136D Documentary Film and Video

One course from the following:

- 194A Film Theory Seminar
- 194B Electronic Media Theory Seminar
- 194C New Media Seminar
- 194D Film History Seminar

- 194E International Cinemas
- 194F Film and the Other Arts: Music and Dance
- 194G New(s) Media
- 194S Senior Seminar: Special Topics
- 196A Senior Project in Film and Video Production
- 196B Senior Project in Screenwriting
- 196C Senior Documentary Workshop
- 197 Senior Digital Media Workshop

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

- up to two upper-division courses in film and digital media production (150, 151, one from the 171 series, 172, 173, 175, 176, 177, or one from the 178 series)
- at least two upper-division film and digital media history/critical studies courses
- up to two upper-division critical studies or production elective courses from another department or another institution; course substitutions must be pre-approved by the Film and Digital Media Department.

### INTEGRATED CRITICAL PRACTICE CONCENTRATION

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The integrated critical practice concentration provides a more rigorous pathway through the film and digital media 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 FILM 120 and at least three other upper-division critical studies classes. Students not already admitted to the production concentration should apply simultaneously to the production concentration. Acceptance into the production concentration is a necessary pre-condition for acceptance into the integrated critical practice concentration. Applicants must already be declared film and digital media majors in good 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 FDM faculty statement of support (submitted directly to the department)
- copies of all narrative evaluations provided by instructors of film and digital media courses

Application materials and instructions are available at the Film and Digital Media Department Office. Student

## Film and Digital Media

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 reapply a second time if not accepted, but not later than the first quarter of their senior year.

### Requirements for the Integrated Critical Practice Concentration

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The integrated critical practice concentration curriculum adds the following requirements to those already established for the film and digital media major. Students are required to take both 20A and 20P for their required lower-division courses, in addition to selecting a third lower-division class from either 20B or 20C. The minimum grade requirement for lower-division courses will apply (see Lower-Division Requirements). Students are required to take 170B as part of their core curriculum, and to complete six elective classes, rather than five. For the senior exit requirement students are required to complete one course (195, 196A, 196B, 196C, or 197) which, combined with an independent study (FILM 199, Tutorial) taken either consecutively or simultaneously, will integrate critical studies and production work.

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

120 Introduction to Film Theory and Criticism

One course from each of the following four groups:

130 Silent Cinema

132A International Cinema to 1960

132B International Cinema, 1960 to Present

134A American Film, 1930–60

134B American Film, 1960–Present

136A Experimental Film and Video

136B History of Television

136C Visual Culture and Technology: History of New Media

136D Documentary Film and Video

170A Fundamentals of Digital Media Production

170B Fundamentals of Film/Video Production

Two courses to satisfy the senior comprehensive requirement:

199 Tutorial, and one of the following:

195 Senior Thesis

196A Senior Project in Film and Video Production

196B Senior Project in Screenwriting

196C Senior Documentary Workshop

197 Senior Project in Digital Media

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

- two upper-division history/critical studies course in film and digital media
- three upper-division courses in film and digital media production (150, 151, 170A, or 170B, one of the 171 series, 172, 173, 175, 176, 177, one of the 178 series)
- one senior seminar chosen from the 194 series
- graduate seminars, taken with permission of the faculty adviser, may substitute for one of the electives
- a maximum of two electives may be taken in another department or another institution if pre-approved by the Film and Digital Media Department

Courses from the above upper-division core curriculum in excess of requirements may NOT count as electives.

### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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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 adviser.

The DC requirement is met by passing one of the following courses, and the comprehensive requirement (see below):

130 Silent Cinema

132A International Cinema to 1960

132B International Cinema, 1960 to Present

134A American Film, 1930-1960

134B American Film, 1960-Present

### COMPREHENSIVE REQUIREMENT

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All seniors in the general film and digital media major select a senior seminar.

- Senior seminar: The senior seminars (courses in the 194 series) are restricted to majors in their senior year and are writing intensive. Students in the general major are required to complete one senior seminar. Students in the production concentration may complete the senior seminar to satisfy the senior exit requirement or as an elective.

All seniors in the production concentration may select either a senior seminar or a senior project.

## Film and Digital Media

- Senior seminar: The senior seminars (courses in the 194 series) are restricted to majors in their senior year and are writing intensive. Students in the general major are required to complete one senior seminar. Students in the production concentration may complete the senior seminar to satisfy the senior exit requirement or as an elective.
- Senior project: A limited number of students in the production concentration may participate in the senior project (FILM 196A, 196B, 196C, or 197) class. Admission is by application, with review of previous works and evaluation of the proposed final project by film and digital media production faculty.

Seniors in the critical studies concentration must complete the following to satisfy the campus exit requirement: FILM 194A, FILM 199, and either FILM 192 or 195.

Seniors in the integrated critical practice concentration must complete one course (195, 196A, 196B, 196C, or 197) combined with an independent study course (199).

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### TRANSFER STUDENTS

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All transfer students must enroll in at least one lower-division course (20A, 20B, or 20C) during their first quarter in residence. Transfer students are strongly encouraged to enroll in 20A during the Summer Session preceding their first quarter in residence. After completing one lower-division course (20A, 20B, or 20C) with a grade of C or better, transfer students may declare the film and digital media pre-major.

All transfer students must earn a C or higher in two 20-level courses, FILM 20A and either 20B or 20C (at least one must be taken at UCSC) to declare the major. Three lower-division courses, nine upper-division courses, and satisfaction of the senior exit requirement are required for completion of the general major. With some lower-division preparation, transfer students should be able to complete the upper-division coursework and the major within two years. As preparation, prospective transfer students are encouraged to complete FILM 20A through UCSC Summer Session prior to their transfer. Transfer students must petition the department to have equivalent lower-division courses taken at their current institution count toward their UCSC major requirements provided they have earned a C or higher in each course.

Students who have not completed a lower-division major requirement prior to transfer to UCSC, students who are interested in graduating with a double major, and students who must finish general education

requirements may need additional time to complete their studies.

Transfer students are strongly advised to attend a UCSC Summer Orientation session for transfer students. Transfer students must consult with a film and digital media academic adviser prior to enrolling in classes to determine their status and to begin the declaration of major process as soon as possible.

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### HONORS

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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.

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### MINOR

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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 20B or 20C, and six upper-division courses including four from the core curriculum of the general major and two electives. There is no production component in the minor, nor is there a comprehensive requirement.

#### DECLARING THE FILM AND DIGITAL MEDIA MINOR

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Students who pass FILM 20A, 20B or 20C are eligible to declare the film and digital media minor.

#### Lower-Division Requirements

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20A Introduction to Film Studies

and one of the following two courses:

20B Introduction to Television Studies

20C Introduction to Digital Media

#### Upper-Division Requirements

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

120 Introduction to Film Theory and Criticism

One course from each of the following three groups:

130 Silent Cinema

132A International Cinema to 1960

132B International Cinema, 1960 to Present

134A American Film, 1930–60

134B American Film, 1960–Present

136A Experimental Film and Video

136B History of Television

136C Visual Culture and Technology: History of New

## Film and Digital Media

### Media

#### 136D Documentary Film and Video

And two upper-division elective courses to be chosen from the following: any two additional upper-division film and digital media history/critical studies courses other than production studio courses (150, 151, 170A through 178B) 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.

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### FILM AND DIGITAL MEDIA PH.D.

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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. Focusing on a diverse range of cultural production that includes cinema, television, video art, and Internet-based media, Ph.D. 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 context

#### REQUIREMENTS

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##### Coursework

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- A minimum of 108 units of study in coursework at UCSC. 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; such a waiver is subject to the approval of 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 (200A-B-C), 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.
- Students are not permitted to enroll in 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 295, 297 and 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 adviser.
- Students must obtain permission from the Director of Graduate Studies, their faculty adviser to take advanced undergraduate courses.
- Students are expected to complete at least one year of supervised teaching as part of the degree requirements.

#### Foreign Language Requirement

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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.

## Film and Digital Media

- 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.

### Timeline: Course Sequence, Examinations, and Dissertation

During the first year of study in FILM 200A-B-C 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 210–289. Students will also be encouraged to take electives from other graduate programs on campus.

At the end of the second year, undergo a second year review which functions as the master's examination. Students will submit four to five coursework projects for the exam. One of these must be the final project from 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 adviser 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 adviser, 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 exam 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 exam (QE).

The third year will be spent developing three qualifying exam topics that will lead to the dissertation in close consultation with the student's faculty adviser. (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 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 exam committee. The QE committee will be comprised of four faculty members, at least one of whom must be from another discipline at UCSC 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 adviser 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 exam 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 exam before their fourth year.) The QE will consist of a written examination and an oral examination. A student who fails the Ph.D. Qualifying Exam will be permitted to retake it one time. During the qualifying exam quarter, students may enroll in up to two 299 (Thesis Research) classes with members of their committee.

No later than two academic quarters after successfully passing the qualifying examination, students submit a Dissertation Prospectus. The candidate's qualifying exam committee must approve this prospectus. After the dissertation prospectus has been approved, the student will participate in a dissertation colloquium open to all film and digital media faculty and graduate students.

Students will advance to candidacy once they have successfully:

## Film and Digital Media

- Completed all required coursework with satisfactory grade
- Satisfied the language requirement
- Passed the Ph.D. qualifying exam
- Submitted a dissertation prospectus approved by their dissertation committee
- Participated in a dissertation colloquium.
- Organize an approved dissertation committee, through the dissertation nomination form.

Elective (from Film and Digital Media or another department)

Foreign language/other elective (at least 2 credits)

Year 2: at least four film and digital media electives; two other electives from Film and Digital Media or another department

### COMPLETION OF THE DEGREE

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

**Dissertation:** 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, at least two must be from the film and digital media faculty. If the dissertation director does not hold a Ph.D. degree, then the majority of the remaining committee members must hold Ph.D.s. When the student has submitted the dissertation and the committee has approved it, the student is ready for the oral defense.

**Oral Defense:** Once the dissertation is approved, the student will present an oral summary before their dissertation committee and invited members of the academic community. The student will then answer questions posed by the faculty.

#### **Sample Student Program for Each Year (Years 1-4)**

Year 1: three core film and digital media courses; three electives, at least two of which are film and digital media courses

#### **Fall**

FILM 200A, Introduction to Graduate Study  
Elective (from Film and Digital Media or another department)  
Foreign language/other elective (at least 2 credits)

#### **Winter**

FILM 200B, Theory and Praxis of Film and Digital Media, Part 1  
Elective (from Film and Digital Media or another department)  
Foreign language/other elective (at least 2 credits)

#### **Spring**

FILM 200C, Theory and Praxis of Film and Digital Media, Part 2

## Film and Digital Media

### **Fall**

Film and digital media elective

Film and Digital media elective

Foreign language/other elective (at least 2 credits)

### **Winter**

Film and digital media elective

Elective (from Film and Digital Media or another department)

Foreign language/other elective (at least 2 credits)

Student suggests M.A. examination committee; prepares for examination.

### **Spring**

Film and digital media elective

Elective (from Film and Digital Media or another department)

Foreign language/other elective (at least 2 credits)

Student takes M.A. examination. If successful, advances to third year.

Year 3: three required film and digital media courses, three electives from Film and Digital Media or another department

### **Fall**

FILM 295, Directed Reading

Elective (from Film and Digital Media or another department)

Foreign language/other elective (at least 2 credits)

### **Winter**

FILM 295, Directed Reading

Elective (from Film and Digital Media or another department)

Foreign language/colloquium study/other elective (at least 2 credits)

Student develops three topic areas for Ph.D. qualifying exam

### **Spring**

FILM 295, Directed Reading

Elective (from Film and Digital Media or another department)

Foreign language/other elective (at least 2 credits)

Student assembles Ph.D. dissertation committee, nominates Ph.D. qualifying examination committee.

### **Year 4**

Student takes Ph.D. qualifying examination, registering for FILM 299, Thesis Research. If successful, advances to candidacy and continues research and writing of dissertation.

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## DESIGNATED EMPHASIS

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

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

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## SOCIAL DOCUMENTATION M.A.

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(See [Social Documentation](#))

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## FILM AND DIGITAL MEDIA FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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#### **Sharon Daniel**

New media documentary and database documentary; social, economic, environmental and criminal justice; participatory culture, community-based public art in information and communications environments; social and political aspects of information design; net art, social-practice art

#### **Eli E. Hollander, Professor Emeritus**

#### **Charles L. Lord, Professor Emeritus**

#### **Margaret Morse, Professor Emerita**

#### **B. Ruby Rich**

Documentary film and video, new queer cinema, feminist film history, Latin American and Latina/o cinema and other global/regional cinemas, U.S. independent film and video, the essay film, film festival studies, and the making/marketing of foreign films in the U.S. As editor of *Film Quarterly*, also advising on journal submission and the craft of editing

#### **Warren Sack**

Software design and media theory

#### **Shelley Stamp**

Film history, theory, and criticism; silent cinema; early Hollywood; women's filmmaking; film censorship; histories of moviegoing; feminist approaches to cinema

#### **Gustavo Vazquez**

Film and video production, documentary and experimental cross-cultural experiences in film

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### ASSOCIATE PROFESSOR

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#### **Lawrence Andrews**

Documentary, sound, animation, installation

#### **Irene Gustafson**

Producing across the boundaries between "theory" and "practice," non-fiction media, experimental film/video, production design, gender and queer studies

#### **Jonathan Kahana**

Documentary film and media; film and politics; American film history; essay film; cultural and social theory; media publics; arts of historical re-enactment; war and cultural memory; audio culture; disciplines of listening

#### **L. S. Kim**

Television history and theory, racial discourse, feminist criticism, Asian-American cultural theory and production, industrial practices and social change in both mainstream Hollywood and alternative media

#### **John Jota Leños**

Documentary animation, social documentation, social art practice, community arts, Chicana/o art and culture, new media, critical media studies, cultural studies, documentary photography, installation art, public art and interventionist art practice

#### **Peter Limbrick**

International cinemas, especially Arab and Middle Eastern cinemas and Australasian cinemas; postcolonial theories and settler colonialism; theories of globalization and transnationalism; intersections of race, gender, and sexuality; queer theory; film and video history and historiography

## Film and Digital Media

### **Irene Lusztig**

Film and video production, experimental ethnography and essayistic nonfiction; representations of historical memory; archives, propaganda and training films; feminist film practices; medical film; autobiographical filmmaking; interactive documentary; editing

### **Rick Prelinger**

Critical archival studies; personal and institutional recordkeeping; access to the cultural record; media and social change; ephemeral cinema; amateur and home movies; participatory documentary; digital scholarship; cinema and public history

### **Yiman Wang**

Theory of difference; film history and theory; colonial/semi-colonial/postcolonial/postsocialist modes of media production and exchange; border-crossing film remakes; silent cinema; translation theory and cinema; acting theory/practice and ethnic star studies with focus on Anna May Wong; transnational connections and ramifications of Chinese cinema and documentary; fan culture; East Asian cinemas

### ASSISTANT PROFESSOR

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### **Anna Friz**

Sound studies and production, transmission art, media art installation and performance, media (especially radio) history, methodologies for research creation

### **Jennifer Horne**

Media citizenship; non-theatrical film and film exhibition; archives and technologies of information; film preservation; mass media and humanitarianism; cinema and media history and historiography; institutions, disciplinarity, and the politics of knowledge; feminist theory

### **Soraya Murray**

Contemporary visual culture and representation including: new media art; projected arts; photography; electronic games; theories of art and globalization; representations of migration and otherness

### **Susana Ruiz**

Game design; games as forms of activism and art; animation; participatory culture; social art practice; non-fiction storytelling; theory/practice hybridity; Theatre of the Oppressed; expanded documentary; interaction design; worldbuilding; transmedia production, scholarship and activism

### **Jennifer Maytorena Taylor**

Social documentation, Latino and Latin American communities, public education, popular culture, religion, incarceration and justice, urban and community development, collaborative practices in journalism and production, transmedia



### PROFESSOR

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### **Julianne Burton-Carvajal, Professor Emerita, Literature**

### **Teresa de Lauretis, Professor Emerita, History of Consciousness**

### **Rosa Linda Fregoso, Professor Emerita, Latin American and Latino Studies**

### **Herman S. Gray, Sociology**

Cultural studies, media and television studies, black cultural politics, social theory

### **Donna J. Haraway, Professor Emerita, History of Consciousness and Feminist Studies**

### **David S. Marriott, History of Consciousness**

Poetics, black cultural studies, literary and psychoanalytic theory, visual culture studies, black cultural theory and philosophies of race, caribbean modernism, Fanon studies

### ASSOCIATE PROFESSOR

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### **Neda Atanasoski, Feminist Studies**

New media and film; critical race and ethnic studies; feminist theory; human rights and humanitarianism; war and nationalism; religion and secularism; post-socialist politics and culture in Central and Eastern Europe

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## FILM AND DIGITAL MEDIA COURSES

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### LOWER-DIVISION COURSES

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### **10. Professional Topics in Film, Television, and Digital Media (2 credits). F**

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. Enrollment restricted to film and digital media majors and minors, pre-majors and proposed majors. The Staff

### **20A. Introduction to Film Studies. F**

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. Students are billed

## Film and Digital Media

a course materials fee. If space allows, restrictions may be lifted after priority enrollment. Enrollment restricted to first-year, sophomore, and junior proposed and pre-film and digital media majors and film and digital media minors. The Staff

### **20B. Introduction to Television Studies. S**

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. Students are billed a course materials fee. If space allows, restrictions may be lifted after priority enrollment. Enrollment restricted to first-year, sophomore, and junior declared, proposed, and pre-film and digital media majors and film and digital media minors. The Staff

### **20C. Introduction to Digital Media. W**

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. Students are billed a course materials fee. If space allows, restrictions may be lifted after priority enrollment. Enrollment restricted to first-year, sophomore,

and junior declared, proposed, and pre-film and digital media majors and film and digital media minors. W. Sack

### **20P. Introduction to Production Technique. S**

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. Students are billed a course materials fee. Prerequisite(s): Course 20A or 20B or 20C or 80A or 80M. Enrollment restricted to pre-majors, proposed majors, majors, minors, frosh, sophomores, juniors, and students not currently declared in the production concentration. (General Education Code(s): PR-C.) The Staff

**42. Student-Directed Seminar. \*** Seminars on selected topics taught by upper-division students under faculty supervision (see course 192). Students submit petition to sponsoring agency. The Staff

**80A. The Film Experience. \*** 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. (General Education Code(s): IM.) The Staff

**80M. Understanding Media. F** 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. (General Education Code(s): IM.) R. Prelinger

### **80S. Special Topics in Film and Digital Media. F,W,S**

Study of selected aspects of film, television, and/or digital media. Includes weekly screenings and historical/theoretical readings. May be repeated for credit. (General Education Code(s): IM, T5-Humanities and Arts or Social Sciences, A.) The Staff, A. Friz, S. Ruiz

**80T. Technothrillers. \*** 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. Students are billed a course materials fee. (Formerly course 80A.) (General Education Code(s): PE-T, T5-Humanities and Arts or Social Sciences, A.) The Staff

### **80V. Video Games as Visual Culture. W**

Through the aesthetics and theory of electronic games, course introduces the histories, ideas, and debates that inform game studies. Topics include: games and cinema; race, class, and representation; narratology/ludology debates; interactivity; serious games; and alternative games. (General Education Code(s): PE-T.) S. Murray

**80X. Sex in the Cinema. \*** 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

## Film and Digital Media

attention to intersections of U.S. political movements with filmmaking and reception. (General Education Code(s): IM, T5-Humanities and Arts or Social Sciences, A.) The Staff

### UPPER-DIVISION COURSES

#### **120. Introduction to Film Theory and Criticism. W**

An introduction to classical and contemporary film theory and those theoretical paradigms and methods that have illuminated the media: formalism, realism, structuralism, semiotics, psychoanalysis, Marxism, feminism, and issues of identity and difference. Students are billed a course materials fee.

Prerequisite(s): course 20A.

Enrollment is restricted to film and digital media majors, pre-majors, proposed majors, and minors during priority enrollment; may be opened if space allows. J. Horne

#### **130. Silent Cinema. S**

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. Students are billed a course materials fee. Usually offered in alternate academic years. Prerequisite(s): course 20A, satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to Film and Digital Media majors. (General Education Code(s): IM.) J. Horne

#### **132A. International Cinema to 1960. \***

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. Students are billed a course materials fee. Usually offered alternate academic years. Prerequisite(s): course 20A, satisfaction of the Entry Level Writing and Composition requirements. (General Education Code(s): CC, A.) P. Limbrick

#### **132B. International Cinema, 1960 to Present. W**

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. Students are billed a course materials fee. Usually offered in alternate academic years.

Prerequisite(s): course 20A, satisfaction of the Entry Level Writing and Composition requirements. (General Education Code(s): CC, A.) The Staff

#### **134A. American Film, 1930-1960. F**

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. Students are billed a course materials fee.

Prerequisite(s): course 20A or 20B, satisfaction of the Entry Level Writing and Composition requirements. Offered in alternate academic years. (General Education Code(s): IM.) S. Stamp

#### **134B. American Film, 1960-Present. \***

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. Students are billed a course materials fee.

Prerequisite(s): course 20A or 20B, satisfaction of the Entry Level

Writing and Composition requirements. Offered in alternate academic years. (General Education Code(s): IM.) S. Stamp

#### **136A. Experimental Film and Video. \***

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. Students are billed a course materials fee.

Prerequisite(s): course 20A . (General Education Code(s): IM, A.) The Staff

#### **136B. History of Television. \***

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 course 136A. Students are billed a course materials fee.

Prerequisite(s): course 20B. (General Education Code(s): IM, A.) R. Prelinger

#### **136C. Visual Culture and Technology: History of New Media. S**

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. Students are billed a course materials fee.

Prerequisite(s): course 20C. (General Education Code(s): PE-T.) S. Murray

## Film and Digital Media

### **136D. Documentary Film and Video. F**

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. (Formerly course 161.) Prerequisite(s): course 20A or 20B. Offered in alternate academic years. (General Education Code(s): IM.) J. Kahana

### **142. Beyond Cybernetics: Advanced Topics in New Media Technologies. \***

Analysis of the effects of communication and information technologies on culture and cultural production through the study of systems and networks. Assignments may include papers, Internet presentations, development/participation in virtual communities, interactive multimedia. Emphasis on advanced critical and experimental approaches. Students are billed a course materials fee. Prerequisite(s): course 20C. Enrollment restricted to film and digital media majors. Enrollment limited to 40. L. Andrews, S. Daniel

### **150. Screenwriting. F**

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 process begins prior to the start of the quarter; application materials available during the last three weeks of preceding quarter.

May be repeated for credit. (General Education Code(s): PR-C, W.) The Staff

### **151. Film Directing. S**

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): courses 20A, 20P, and/or 170B are recommended. Admission by application process begins prior to the start of the quarter; application materials available during the last three weeks of preceding quarter. Enrollment limited to 25. (General Education Code(s): PR-E, A.) The Staff

### **152. Script Analysis. \***

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(s): course 120. Enrollment restricted to film and digital media majors and film and digital media pre-majors. Enrollment limited to 25. The Staff

### **160. Film Genres. W**

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. Students are billed a course materials fee. Prerequisite(s): course 130, 132A, 132B, 132C, 134A or 134B. May be repeated for credit. (General Education Code(s): IM, A.) The Staff

### **161. Topics in Documentary.**

Study of topics in documentary film and video. The Staff

### **161B. Documentary Animation. \***

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(s): course 20A. Enrollment restricted to juniors and seniors. J. Leanos

### **162. Film Authors. F**

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. Students are billed a course materials fee. Prerequisite(s): course 130, 132A, 132B, 132C, 134A, or 134B.. May be repeated for credit. (General Education Code(s): IM.) The Staff

### **165A. Film, Video, and Gender. W**

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. Students are billed a course materials fee. Usually offered in alternate academic years. Prerequisite(s): course 20A or 20B. (General Education Code(s): A.) The Staff

### **165B. Race on Screen. F**

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

## Film and Digital Media

debates about race produced within and across film and digital media. Students are billed a course materials fee. Usually offered in alternate academic years.

Prerequisite(s): course 20A or 20B. (General Education Code(s): ER, E.) Y. Wang

### **165C. Lesbian, Gay, and Queer Film and Video. \***

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. Students are billed a materials fee. Enrollment restricted to juniors, sophomores, and seniors. (General Education Code(s): IM.) The Staff

### **165D. Asian Americans and Media. S**

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. Students are billed a course materials fee.

Prerequisite(s): course 20A.

Enrollment restricted to sophomores, juniors, and seniors. Enrollment limited to 60. (General Education Code(s): ER, E.) L. Kim

### **165E. Chicana/o Cinema, Video. \***

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. Students are billed a course materials fee.

Prerequisite(s): course 20A.

Enrollment restricted to sophomores, juniors, and seniors. Enrollment limited to 60. (General Education Code(s): CC, E.) The Staff

### **165G. Gender and Global Cinema. \***

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. Students are billed a course materials fee. (Formerly course 132C.)

Prerequisite(s): course 20A. (General Education Code(s): CC, E.) Y. Wang

### **168. National Cinema and Culture. F,S**

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. Students are billed a course materials fee.

Prerequisite(s): course 130, 132A, 132B, or 132C. May be repeated for credit. (General Education Code(s): CC.) Y. Wang, The Staff

### **170A. Fundamentals of Digital Media Production. F,S**

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. Students are billed a course materials fee.

Prerequisite(s): course 20C or Computer Science 101 or Computer Science 109. Enrollment limited to 20. (General Education Code(s): PR-C, A.) The Staff

### **170B. Fundamentals of Film and Video Production. F,W,S**

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): course 20A or 20B and one other film/video and digital media critical studies or history course required. Completion of additional upper-division film and digital media critical studies or history courses improves students' ability to be admitted to this course. Admission by application process begins prior to the start of the quarter; application materials available during the last three weeks of preceding quarter. Enrollment limited to 24. (General Education Code(s): PR-C, A.) The Staff, J. Taylor, L. Andrews

### **171. Special Topics Workshops.**

Study of selected aspects of film, video, and/or digital media production. The Staff

### **171A. Sound. F**

The cinematic equation equals images plus sound. What are sound-specific properties? What is the relationship between sound and image? Examines these and other questions through the creation of audio and audiovisual pieces. Students are billed a course materials fee. Prerequisite(s): priority given to students who have been accepted into the production concentration. Admission by application process begins prior to the start of the quarter; application

## Film and Digital Media

materials available during the last three weeks of preceding quarter. Students who are not in the production concentration and who have completed course 170A or 170B may apply by submitting an application and sample of production work at first class meeting; these applications will be considered on a space-available basis. Enrollment limited to 20. A. Friz

### **171C. Special Topics Workshop: Found Footage. F**

Students will consider the practice of "recycling" images perhaps not intended by the original "owner" or "creator." In addition to assigned readings and technical workshops, students produce three video projects and give a presentation on a specific issue or artist/group. Prerequisite(s): course 170A or 170B; priority given to students who have been accepted into the production concentration. Admission by application process begins prior to the start of the quarter; application materials available during the last three weeks of preceding quarter. Students who are not in the production concentration and who have completed course 170A or 170B may apply by submitting an application and sample of production work at first class meeting; these applications will be considered on a space-available basis. Enrollment limited to 20. (General Education Code(s): PR-C.) R. Prelinger

### **171D. Social Information Spaces. \***

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(s): course 170A. Enrollment limited to 20. The Staff

### **171F. Special Topics Workshop: Autobiographical Film. W**

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. Admission by application process begins prior to the start of the quarter; application materials available during the last three weeks of preceding quarter. Students who are not in the production concentration and who have completed course 170A or 170B may apply by submitting an application and sample of production work at first class meeting; these applications will be considered on a space-available basis. Students are billed a course materials fee. Enrollment limited to 20. I. Luszti

### **171G. Documentary Animation Workshop. \***

A project-based production seminar in documentary animation: students learn diverse animation styles and techniques, and apply them to a documentary-animation class project. Courses 161B and 170A are strongly recommended as preparation (or equivalent background). Enrollment by interview only: an online application process is available in the preceding quarter. Enrollment limited to 20. J. Leanos

### **172. Narrative Video Workshop. F,W**

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): priority given to students who have been accepted into the production concentration. Admission by application process begins prior to the start of the quarter; application materials available during the last three weeks of preceding quarter. Students who are not in the production concentration and who have completed course 170A or 170B may apply by submitting an application and sample of production work at first class meeting; these applications will be considered on a space-available basis. Enrollment limited to 20. L. Andrews, (F) The Staff

### **173. Narrative Digital Media Workshop. \***

Analysis of cinematic codes and narrative structure through digital video, Internet and interactive multimedia projects. Required readings address contemporary research in narratology and hypermedia, exploring the potential of digital technology to reconfigure the role of both author and audience. Students billed a materials course fee. Prerequisite(s): course 170A. Enrollment limited to 20. S. Daniel

### **175. Documentary Video Workshop. W**

Workshop in documentary video production, development of critical standards, ethical issues, and

## Film and Digital Media

technical methods. Each student is responsible for the completion of short documentaries from assignments. Students are billed a course materials fee.

Prerequisite(s): priority given to students who have been accepted into the production concentration. Admission by application process begins prior to the start of the quarter; application materials available during the last three weeks of preceding quarter. Students who are not in the production concentration and who have completed course 170A or 170B may apply by submitting an application and sample of production work at first class meeting; applications will be considered on a space-available basis. Enrollment limited to 20. J. Taylor

### **176. Experimental Video Workshop. S**

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. Students must bear the cost of all materials. Prerequisite(s): course 170B; priority given to students who have been accepted into the production concentration. Admission by application process begins prior to the start of the quarter; application materials available during the last three weeks of preceding quarter. Students who are not in the production concentration and who have completed course 170B may apply by submitting an application and sample of production work at first class meeting; these applications will be considered on a space-available basis. Enrollment

limited to 20. (General Education Code(s): A.) G. Vazquez

### **177. Digital Media Workshop: Computer as Medium. W**

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. Students are billed a course materials fee. Prerequisite(s): course 170A. Enrollment limited to 20. S. Daniel

### **178A. Personal Computers in Film and Video. \***

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. Prerequisite(s): course 170A or 170B; priority given to students who have been accepted into the production concentration. Admission by application process begins prior to the start of the quarter; application materials available during the last three weeks of preceding quarter. Students who are not in the production concentration and who have completed course 170B may apply by submitting an application and sample of production work at first class meeting; these applications will be considered on a space-available basis. Students are billed a course materials fee. Enrollment limited to 20. S. Ruiz

### **178B. Advanced Personal Computers in Film and Video. \***

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): course 170A; priority given to students who have been accepted into the production concentration. Admission by application process begins prior to the start of the quarter; application materials available during the last three weeks of preceding quarter. Students who are not in the production concentration and who have completed course 170A may apply by submitting an application and sample of production work at first class meeting; these applications will be considered on a space-available basis. Enrollment limited to 20. The Staff

### **180. Writing About Film, Television, and Digital Media. \***

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(s): course 20A, 20B, or 20C. Enrollment restricted to sophomore and junior film and digital media majors. Enrollment limited to 20. L. Kim

### **185. Special Topics in Film and Video.**

Study of selected aspects of film and/or video history, theory, or criticism. Students are billed a course materials fee. The Staff

### **185D. Sound and Image in Theory and Criticism. S**

Explores theories and critiques of sound in culture and analyzes sound in relation to media images

## Film and Digital Media

in film, video, and other media. Voice, noise, and music are addressed. Students are billed a course materials fee.

Prerequisite(s): course 120.

(General Education Code(s): A.) J. Kahana

### **185R. The Film Remake. \***

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. Students are billed a course materials fee. Prerequisite(s): course 120, 130, 132A, 132B, 132C, 134A or 134B. The Staff

### **185S. Advanced Topics in Film Studies. \***

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. Students are billed a course materials fee. Prerequisite(s): courses 120, 130, 132A, 132B, 132C, 134A, or 134B. May be repeated for credit. J. Kahana

### **185X. EyeCandy Seminar. W**

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. Students are billed a

course materials fee. May be repeated for credit. (General Education Code(s): PR-E.) R. Prelinger

### **187. Advanced Topics in Television Studies. \***

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. Students are billed a course materials fee. Prerequisite(s): course 20B. Enrollment restricted to junior and senior film and digital media majors and minors. May be repeated for credit. L. Kim

### **189. Advanced Topics in Digital and Electronic Media Studies. S**

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. Students are billed a course materials fee. Prerequisite(s): course 20C. Enrollment restricted to junior and senior film and digital media majors and minors during priority enrollment; may be opened if space allows. May be repeated for credit. The Staff

### **192. Directed Student Teaching. F,W,S**

Teaching a lower-division course under faculty supervision (see course 42). Proposal supported by a faculty sponsor and department. The Staff

### **194A. Film Theory Seminar. F**

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. Students are billed a course materials fee. Prerequisite(s): course 120. Enrollment restricted to senior film and digital media majors. Enrollment limited to 20. The Staff

### **194B. Electronic Media Theory Seminar. \***

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. Students are billed a course materials fee.

Prerequisite(s): courses 20B and 120. Enrollment restricted to senior film and digital media majors. Enrollment limited to 20. L. Kim

### **194C. New Media Theory Seminar. \***

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. Students are billed a course materials fee. Prerequisite(s): courses 20C and 120. Enrollment restricted to senior film and digital media majors. Enrollment limited to 20. S. Daniel

### **194D. Film History Seminar. S**

In-depth study of film history investigating developments in cinematic style, technological innovation, and industrial practice against the broad canvas of cultural

## Film and Digital Media

history. Students will acquire the basic tools necessary to conduct informed film historical research. Students are billed a course materials fee. Prerequisite(s): course 120 and either 130 or 134A or 134B. Enrollment restricted to senior film and digital media majors. Enrollment limited to 20. J. Horne

### **194E. International Cinemas. S**

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. Students are billed a course materials fee. Prerequisite(s): course 120 and either 132A, 132B, or 132C. Enrollment restricted to senior film and digital media majors. Enrollment limited to 20. The Staff

### **194F. Film and the Other Arts. \***

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? Students are billed a course materials fee. Prerequisite(s): course 120. Enrollment restricted to senior film and digital media majors. Enrollment limited to 20. L. Kim

### **194G. New(s) Media. \***

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. Students are billed a course materials fee. Prerequisite(s): courses 20C and 120. Enrollment restricted to senior film and digital media majors. Enrollment limited to 20. W. Sack

### **194S. Special Topics Seminar. W,S**

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. Students are billed a course materials fee. Prerequisite(s): course 120. Enrollment restricted to senior film and digital media majors. Enrollment limited to 20. May be repeated for credit. J. Kahana, The Staff

### **195. Senior Thesis/Project. F,W,S**

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. The Staff

### **196A. Senior Project in Narrative Production. W,S**

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 process begins prior to the start of the quarter; application materials available during the last three weeks of preceding quarter. Students may apply a maximum of two times. Enrollment limited to 20. G. Vazquez, The Staff

### **196B. Senior Project in Screenwriting. W**

Students write a full-length (75–100 page) 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; course 150 or another screenwriting course. Interview only: petition required; special application should be submitted to adviser one quarter in advance; see department office for more information. Enrollment restricted to senior film and digital media majors. Enrollment limited to 16. (General Education Code(s): W.) The Staff

### **196C. Senior Documentary Workshop. S**

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. Admission by application during the preceding quarter. Enrollment restricted to senior film and digital media majors. Students are billed a course materials fee. Enrollment limited to 20. I. Lusztig

### **197. Senior Digital Media Workshop. \***

Independent projects using the computer as a medium as well as a tool. Students will 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. Students are billed a course materials fee. Admission by application during previous quarter. See department office for more information. Enrollment limited to 20. W. Sack

## Film and Digital Media

### **198. Independent Field Study. F,W,S**

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. May be repeated for credit. The Staff

### **198F. Independent Field Study (2 credits). F,W,S**

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. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

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. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

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. May be repeated for credit. The Staff

## **GRADUATE COURSES**

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### **200A. Introduction to Graduate Study. F**

Introduces graduate study in the critical practice of film and digital media. Conducted as a pro-seminar, with faculty presentations and discussion. Enrollment restricted to graduate students. Enrollment limited to 15. J. Horne

### **200B. Theory and Praxis of Film and Digital Media 1. W**

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. Enrollment restricted to graduate students. Enrollment limited to 15. Y. Wang

### **200C. Theory and Praxis of Film and Digital Media 2. S**

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. Students are billed a course materials fee. Enrollment restricted to graduate students. Enrollment limited to 15. I. Gustafson

### **204. Grant Writing (2 credits). W**

Devoted entirely to writing grant proposals. Students work on grants for educational support, their doctoral dissertation grants, or both. (Also offered as History of Art&Visual Culture 204. Students cannot receive credit for both courses.) Enrollment restricted to visual studies and film and digital

media graduate students.

Enrollment limited to 15. May be repeated for credit. The Staff

### **222. Critical Methodologies in Film and Television. \***

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. Enrollment restricted to graduate students. Enrollment limited to 14. The Staff

### **223. The Film/Video Essay. S**

Focuses on "essayistic" approaches to scholarship and production, emphasizing relationships between theory and praxis that this mode of production requires. Enrollment restricted to graduate students. Enrollment limited to 15. I. Gustafson

### **224. Mediating Difference. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. Y. Wang

### **225. Software Studies. \***

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. Enrollment restricted to graduate students. W. Sack

**226. Queer Theory and Global Film and Media. \***

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. Enrollment restricted to graduate students. P. Limbrick

**227. Representing Memory. F**

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. Enrollment restricted to graduate students Enrollment limited to 15. I. Lusztig

**228. Moving Image Archives and the Frontiers of Information. W**

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. Enrollment restricted to graduate students. Enrollment limited to 15. R. Prelinger

**229. Topics in Documentary Studies. S**

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. Enrollment restricted to graduate students. Enrollment limited to 15. J. Kahana

**230. Expanded Documentary. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. S. Daniel

**231. Topics in Postcolonial Theories, Film, and Media. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. P. Limbrick

**232. Audiovisual Ethnography. \***

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. Enrollment restricted to graduate students in film, anthropology, or social documentation. Enrollment limited to 10. I. Lusztig

**233. Studies and Practice for Social Documentation, Filmmaking, and New Media. W,S**

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. (Also offered as Social Documentation 293. Students cannot receive credit for both courses.) Enrollment restricted to graduate students in film and digital media. Graduate students from other programs may enroll by permission of the instructor. Enrollment limited to 15. J. Leanos, L. Andrews

**234. Toward an Ethics of New Media. F**

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. Enrollment restricted to graduate students. Enrollment limited to 15. S. Murray

**235. Feminist Media Histories. W**

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. Enrollment restricted to graduate students. Enrollment limited to 15. S. Stamp

**236. Making...in the Anthropocene. S**

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. Enrollment is restricted to graduate students. Enrollment limited to 10. C. Lord

**283. New Media Art and Digital Culture. \***

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. Students are billed a course materials fee. Enrollment restricted

to graduate students. Enrollment limited to 15. The Staff

**284. Film, Culture, and Modernity. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. S. Stamp

**295. Directed Reading. F,W,S**

Directed reading that does not involve a term paper. Students submit petition to course-sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**297. Independent Study. F,W,S**

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. May be repeated for credit. The Staff

**297F. Independent Study (2 credits). F,W,S**

Students submit petition to course-sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**299. Thesis Research. F,W,S**

Students submit petition to course sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# FRENCH

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2015-16 General Catalog

Department of Languages and Applied Linguistics

218 Cowell College

(831) 459-2054

<http://language.ucsc.edu>

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## PROGRAM DESCRIPTION

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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 language studies, a major in literature with an emphasis in French literature, or a major in global economics.

Lower-division courses 1-6 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.

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### CAMPUS LANGUAGE LABORATORIES AND PLACEMENT EXAMS

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Information about these topics can be found under [Department of Languages and Applied Linguistics](#).

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### STUDY ABROAD

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The Office of International Education (OIE) 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 their web site, <http://oie.ucsc.edu>.

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## FRENCH FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**Carla Freccero (Literature, History of Consciousness, Feminist Studies)**

Renaissance studies; French and Italian language and literature; early modern studies; postcolonial theories and literature; contemporary feminist theories and politics; queer theory; U.S. popular culture; posthumanism; animal studies

**Pascale Gaitet, Emerita (Literature)**

**Sharon Kinoshita (Literature)**

Mediterranean studies; medieval francophone and Mediterranean literature; literature, translation, and empire; postcolonial and globalization theory; Marco Polo; world literature and cultural studies

**Richard Terdiman, Emeritus**

ASSOCIATE PROFESSOR

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**Bryan Donaldson (French)**

Word order variation in second-language French, medieval French and medieval Occitan through the lens of information structure, discourse analysis, and sociolinguistics

LECTURER

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**Greta Hutchison**

Foreign language pedagogy, second language acquisition, 20th-century French history and civilization, medieval French literature, 19th-century literature and art

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## FRENCH COURSES

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### LOWER-DIVISION COURSES

#### 1. First-Year French.

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. (Formerly Instruction in the French Language.) The Staff

#### 2. First-Year French.

Further development of cultural competence and basic French language skills, both written and spoken. Students learn past tenses in this course. (Formerly Instruction in the French Language.) Prerequisite(s): course 1 or placement by interview. The Staff

#### 3. First-Year French.

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. (Formerly Instruction in the French Language.) Prerequisite(s): course 2 or placement by interview. The Staff

#### 4. Second-Year French.

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. (Formerly Intermediate French.) Prerequisite(s): course 3 or placement by interview. (General Education Code(s): CC, IH.) The Staff

#### 5. Second-Year French.

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. (Formerly Intermediate French.) Prerequisite(s): course 4 or placement by interview. (General Education Code(s): CC, IH.) The Staff

#### 6. Second-Year French.

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. (Formerly Intermediate French.) Prerequisite(s): course 5 or placement by interview. (General Education Code(s): CC, IH.) The Staff

#### 94. Group Tutorial. F,W,S

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. May be repeated for credit. The Staff

#### 99. Tutorial. F,W,S

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

#### 99F. Tutorial (2 credits). F,W,S

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### UPPER-DIVISION COURSES

#### 108. French Cinema.\*

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.

(Formerly course 80.) Enrollment limited to 40. May be repeated for credit. (General Education Code(s): IM.) The Staff

#### 111. Stylistics.\*

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(s): course 6. Students interested in this course who have not taken the prerequisite should meet with the instructor prior to the first class meeting. May be repeated for credit. The Staff

#### 114. French Phonetics.\*

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(s): course 6. Enrollment limited to 20. The Staff

#### 120. French Linguistics. W

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(s): course 6 or equivalent proficiency in French or by consent of the instructor. B. Donaldson, The Staff

#### 125A. French Civilization: 19th Century.\*

Survey of the important historical events, social changes, and artistic movements contributing to the development of French culture during the 19th century. Prerequisite(s): course 6. The Staff

French

**125B. French Civilization: 20th Century. F**

A survey of the important historical events, social changes, and artistic movements contributing to the development of French culture during the 20th century.

Prerequisite(s): course 6. The Staff

**136. La Francophonie. S**

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(s): course 6. May be repeated for credit. A. Elsey, (F) The Staff

**194. Group Tutorial. F,W,S**

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. May be repeated for credit. The Staff

**199. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# GERMAN

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2015-16 General Catalog

Department of Languages and Applied Linguistics

218 Cowell College

(831) 459-2054

<http://language.ucsc.edu>

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## PROGRAM DESCRIPTION

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Students interested in acquiring proficiency in German can enroll in language courses from beginning to advanced levels. In addition, students may select from among the following programs: a major or minor in language studies, a major in German studies, a major in literature with an emphasis in German literature, or a major in global economics.

The sequence of lower-division courses 1–6 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 1A and 1B, which offer accelerated German language instruction. Courses 1A and 1B are taught sequentially, winter and spring quarters. Instruction takes place almost exclusively in German.

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### CAMPUS LANGUAGE LABORATORIES AND PLACEMENT EXAMS

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Information about these topics can be found under [Department of Languages and Applied Linguistics](#).

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### STUDY ABROAD

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The Office of International (OIE) offers study abroad opportunities in Berlin, Potsdam, and Göttingen. Students may spend fall or spring semesters or a full academic year in Berlin (Berlin European Studies (BEST) or regular course of study), a spring semester in Potsdam (beginning German language program or intermediate German language and culture program),

or a semester or year in Göttingen (graduate study). Language requirements for admission to these programs range from little or no German required (BEST program in Berlin and beginning German program in Potsdam) to one year of college-level German required (intermediate German language and culture program in Potsdam) to two years of college-level German required (regular course of study in Berlin). The Potsdam program courses may also be used to fulfill the language requirement for the year-long program in Berlin. Selected students may continue directly from the spring semester in Potsdam to the one-year program in Berlin. Academic and professional internship opportunities are also available to all students on study abroad in Germany.

Students may apply to any of these programs at any point in their student career. For the year-long 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 UCSC 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 OIE web site, <http://oie.ucsc.edu>. For information on credit applied to a major, contact the appropriate department.

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## GERMAN FACULTY AND PROFESSIONAL INTERESTS

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### ASSOCIATE PROFESSOR

#### **Zsuzsanna Abrams**

Applied linguistics, language pedagogy, second language acquisition, intercultural communication, discourse analysis, computer-mediate communication

#### **A. Hunter Bivens (Literature)**

Twentieth- and 21st-century German literature and film, Marxism and critical theory, psychoanalysis, lyric poetry, literary realism, the novel

#### **Loisa Nygaard (Literature)**

Eighteenth- and early 19th-century German literature; romanticism; aesthetics and politics of landscape; military theory

### LECTURER

#### **Walter Campbell**

Language teaching, 18th- and 19th-century German literature, history of German

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## GERMAN COURSES

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### LOWER-DIVISION COURSES

#### **1. First-Year German. F**

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 (1-2-3) starts in fall quarter only. (An accelerated sequence, courses 1A-1B, begins in winter quarter.) (Formerly Instruction in the German Language.) The Staff

#### **1A. Accelerated German. W**

Accelerated course covers German 1 and part of German 2. It is designed for motivated beginning students. Students develop skills in speaking, reading, writing, and listening to real-life German. (Formerly Intensive Elementary German.) The Staff

#### **1B. Accelerated German. S**

Accelerated course part 2 covers part of German 2 and all of German 3. In this course, students who have successfully completed German 1A (or its equivalent) continue to develop competence in speaking, reading, writing, and understanding real-life German. (Formerly Intensive Elementary German.) Prerequisite(s): course 1A or 2 or placement by examination. For

students completing course 2, course 3 is preferable. The Staff

#### **2. First-Year German. W**

German 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. (Formerly Instruction in the German Language.) Prerequisite(s): course 1 or 1A or placement by examination. The Staff

#### **3. First-Year German. S**

German 3 is designed for students who have successfully completed German 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. (Formerly Instruction in the German Language.) Prerequisite(s): course 2 or placement by examination. The Staff

#### **4. Second-Year German. F**

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. (Formerly Intermediate Studies in German Language.) Prerequisite(s): course 1B or 3 or placement by examination. (General Education Code(s): CC, IH.) The Staff

#### **5. Second-Year German. W**

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. (Formerly Intermediate Studies in German Language.) Prerequisite(s): course 4 or placement by examination. (General Education Code(s): CC, IH.) The Staff

#### **6. Second-Year German. S**

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. (Formerly Intermediate Studies in German Language.) Prerequisite(s): course 5 or placement by examination. (General Education Code(s): CC, IH.) The Staff

## German

### **94. Group Tutorial. F,W,S**

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. May be repeated for credit. The Staff

### **99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **99F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## UPPER-DIVISION COURSES

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### **119. German Media. S**

This third-year language and culture course is designed for students who are comfortable speaking and writing German at the German 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(s): course 5 or placement by examination. Enrollment limited to 25. May be repeated for credit. (General Education Code(s): CC.) The Staff, Z. Abrams, W. Campbell

### **194. Group Tutorial. F,W,S**

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. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

Revised: 09/01/15

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# GERMAN STUDIES

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2015-16 General Catalog

Department of History

201 Humanities

(831) 459-2982

<http://germanstudies.ucsc.edu/>

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## PROGRAM DESCRIPTION

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German studies is a transnational and transdisciplinary major that deals with the various German-speaking regions of central Europe. Whether one thinks of philosophy, music, art, education, religion, or political and social history, German culture has exercised a profound and often decisive influence on Europe. Some of the most important ideological debates in Western culture have arisen in the German-speaking area, and changes in German culture and society have sometimes had devastating effects on world history. Events and political developments of recent years—such as the unification of East and West Germany and the emergence of the German-speaking region of Europe as a major player in world affairs—have had important impacts.

A German studies major provides students with an intellectually diverse program covering history, history of art and visual culture, literature, and philosophy—in which students and faculty come together in exciting and demanding pursuits.

The German studies major is administered by the Department of History. For additional information on curriculum and advising, go to <http://germanstudies.ucsc.edu>.

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### PROGRAM LEARNING OUTCOMES

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Students who complete the German studies major should graduate with the following knowledge and skills:

#### LANGUAGE

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Mastery of the German language sufficient to engage in scholarly discussions, to understand lectures in the language, and to read primary and secondary texts in literature, history, philosophy, art, music, and other humanities-related fields.

#### HISTORY AND LITERATURE

---

A knowledge of the history, literature, and culture of Germany and German-speaking Europe.

#### TRANSDISCIPLINARITY AND CROSS-CULTURAL ANALYSIS

---

The skills to think, do research, and write in a cross-disciplinary or transdisciplinary fashion.

The ability to work across multiple cultures and linguistic traditions.

#### CRITICAL READING

---

The ability to read closely and to think rigorously, analytically, and imaginatively about different kinds of texts.

The ability to use primary and secondary sources to understand historical and literary narratives.

The ability to understand and evaluate historical ideas, arguments, and points of view, and place them within the larger cultural context of Europe and the world.

The ability to evaluate competing interpretations and multiple narratives of the past through the use of fictional and non-fictional literature.

#### RESEARCH AND EVIDENCE

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The skills to gather and assess primary historical and literary evidence in order to create and challenge narratives and interpretations of Germany's present and past.

The skills to compile a bibliography and utilize footnotes effectively.

#### COLLABORATION

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The ability to provide constructive and effective critiques of each other's work.

The ability to undertake and complete a shared research project.

#### COMMUNICATION

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The ability to write lucid, concise, and effective prose.

The ability to speak cogently and persuasively in both English and German.

The skills to present clear and compelling arguments, based on critical analysis of diverse historical, literary, and philosophical sources, and effectively communicate

## German Studies

them in written essays, oral presentations, and/or other media.

The skills to develop a research question and complete a well-supported piece of written scholarship about it.

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### SCOPE AND THEMATICS

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Transnational or transcultural circulations of ideas, people, and cultures inside and outside Central Europe. Modern intellectual and cultural traditions in the German-speaking area and their impact on other parts of the world.

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### REQUIREMENTS FOR THE MAJOR

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German language level 5 or the equivalent is a prerequisite for the German studies major and all upper-division courses taught in German. Students are encouraged to take German 1 through German 5 as early as possible in their academic program. The major requires a total of 11 courses, including the comprehensive requirement. No more than two of the 11 required courses may be lower-division. A minimum of 40 upper-division units must be completed within the German studies course requirements. In consultation with a faculty adviser, students will plan a program of study to fulfill the following distribution of courses:

I. Five courses in German literature and history:

- two core courses in German literature
- one core course in German history
- one core course in either German literature or German history depending upon the student's chosen area of emphasis
- one comprehensive exit requirement (see below).

II. Three additional core courses, including EAP courses

III. Three additional core courses or courses from the Germany in a European or World Context list.

**Distribution requirements.** A minimum of five of the 11 required courses must be taught in German or principally through German-language texts. No more than three courses may come from the Germany in a European or World Context list.

**Comprehensive requirement.** All German studies majors must satisfy the comprehensive exit requirement by completing an approved exit seminar in either German literature or German history: History 196G, History 196P, History 196X, or Modern Literary Studies (LTMO) 190Z. The senior seminar is one of the 11 courses required for the major. Please consult the German studies web site for a more detailed description of these courses at <http://germanstudies.ucsc.edu>.

**UC Education Abroad Program.** It is strongly recommended that students spend time in residence in Germany through the University of California Education Abroad Program (EAP) or one of its affiliate programs to further enrich their program of study and ensure a command of the language. Students are allowed to transfer up to five courses taken at German universities toward the requirements for the major. However, the four required core courses in German literature and history and the comprehensive requirement must be taken at UCSC.

**Disciplinary Communication (DC) requirement.** Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in German studies is fulfilled by completing History 196G, History 196P, History 196X, or Modern Literary Studies (LTMO) 190Z. Please refer to updated information at [Disciplinary Communication Chart](#).

**Honors in the German Studies major.** All students who announce candidacy during the academic year are reviewed for honors or highest honors in the major. The German studies faculty advisers determine honors based upon courses applied towards the German 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.

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## GERMAN STUDIES FACULTY AND PROFESSIONAL INTERESTS

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### PROGRAM FACULTY

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**Zsuzsanna Abrams, Associate Professor of Languages and Applied Linguistics**

Applied linguistics, language pedagogy, second language acquisition, intercultural communication, discourse analysis, computer-mediate communication

**Amy Beal, Professor, Music**

American music, 20th-century music, experimental and improvisatory performance practices, postwar and Cold War culture, German new music festivals and radio stations, piano performance, contemporary music ensemble

**A. Hunter Bivens, Associate Professor in Literature**

Twentieth- and 21st-century German literature and film, Marxism and critical theory, psychoanalysis, lyric poetry, literary realism, the novel

**Walter Campbell, Continuing Lecturer in German Language**

Language teaching, 18th- and 19th-century German literature, history of German

**Mark Cioc, Professor of History**

German history, modern European history, environmental history

**Jocelyn Hoy, Continuing Lecturer, Philosophy**

Feminist philosophy, 19th- and 20th-century continental philosophy

**Donna Hunter, Associate Professor of History of Art and Visual Culture**

European painting (especially French) from 1600 to the 1960s; German art and visual culture between the two world wars; art as social practice, portraiture

**Virginia Jansen, Emerita, History of Art and Visual Culture**

**Margaret Morse, Professor, Film and Digital Media**  
Digital and electronic media theory and criticism, media art, media history, technology and culture, film history and theory, German cinema, documentary, science fiction, and silent comedy

**Loisa Nygaard, Associate Professor of Literature**

Eighteenth- and early 19th-century German literature; romanticism; aesthetics and politics of landscape; military theory

### PROGRAM FACULTY ADVISERS

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**Mark Cioc, Professor of History**

**Loisa Nygaard, Associate Professor of German Literature**

**A.Hunter Bivens, Associate Professor of German Literature**

Revised: 09/01/15

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# GREEK

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2015-16 General Catalog

History Department

201 Humanities

(831) 459-2982

<http://history.ucsc.edu/>

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## PROGRAM DESCRIPTION

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The History Department offers instruction in elementary ancient Greek. It consists of a two-course sequence, Greek 1 and Greek 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.

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### CAMPUS LANGUAGE LABORATORIES AND PLACEMENT EXAMS

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No placement exam is required for entry into Greek 1. Contact the History Department for more information about these topics.

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## GREEK FACULTY AND PROFESSIONAL INTERESTS

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### **Karen Bassi (Literature)**

Greek and Latin literatures; gender; literary and cultural theory, pre- and early modern studies, historiography; visual and performance studies

### **Mary-Kay Gamel (Literature), Emerita**

### **Gildas Hamel (History), Emeritus**

### **Charles W. Hedrick Jr. (History)**

Greek and Roman history

### **John P. Lynch (Literature), Emeritus**

### **Jennifer Lynn (History)**

Later Roman Republic and Principate; Homeric epic; Hellenistic and Augustan poetry; the lives of women in the ancient world; the lives of women in the ancient world

### **Daniel Selden (Literature)**

Afroasiatic languages and literatures, Greek and Latin, Hellenistic culture, the classical tradition, history of criticism, literary theory

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## GREEK COURSES

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### LOWER-DIVISION COURSES

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#### **1. Elementary Ancient Greek. F**

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. The Staff

#### **2. Elementary Ancient Greek. W**

Instruction in the grammar of Attic Greek, together with readings from ancient authors, designed to prepare for the study of classical literature. Prerequisite(s): course 1, or permission of instructor The Staff

#### **99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

#### **99F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

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Revised: 09/01/15

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# HEBREW

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2015-16 General Catalog

Department of Languages and Applied Linguistics

218 Cowell College

(831) 459-2054

<http://language.ucsc.edu>

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## PROGRAM DESCRIPTION

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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 Hebrew 80. Hebrew 1, Hebrew 2, and Hebrew 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.

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### CAMPUS LANGUAGE LABORATORIES AND PLACEMENT EXAMS

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Information about these topics can be found under [Department of Languages and Applied Linguistics](#).

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## HEBREW FACULTY AND PROFESSIONAL INTERESTS

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### LECTURER

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#### **Tammi Rossman-Benjamin**

Hebrew language and culture, biblical Hebrew syntax and semantics, the Hebrew Bible, Jewish thought, psycholinguistics, second-language acquisition and bilingualism

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## HEBREW COURSES

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### LOWER-DIVISION COURSES

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#### **1. First-Year Hebrew. F**

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. (Formerly Instruction in the Hebrew Language.) The Staff

#### **2. First-Year Hebrew. W**

Speaking, listening comprehension, reading, and writing fundamentals. The use of Modern Hebrew is encouraged through classroom

practice supplemented by work with computer tutorials. (Formerly Instruction in the Hebrew Language.) Prerequisite(s): course 1 or by consent of instructor. The Staff

#### **3. First-Year Hebrew. S**

Speaking, listening comprehension, reading, and writing fundamentals. The use of Modern Hebrew is encouraged through classroom practice supplemented by work with computer tutorials. (Formerly Instruction in the Hebrew Language.) Prerequisite(s): course 2 or by consent of instructor. The Staff

#### **4. Second-Year Hebrew. F**

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. (Formerly Intermediate Hebrew.) Prerequisite(s): course 1B or 3 or by consent of instructor. (General Education Code(s): IH.) The Staff

#### **5. Second-Year Hebrew. \***

Development of the students' familiarity with the spoken and written language through grammar

## Hebrew

review, discussions, and vocabulary building. Varied readings on literary and cultural topics related to modern Israel. (Formerly Intermediate Hebrew.)

Prerequisite(s): course 4 or by consent of instructor. (General Education Code(s): IH.) The Staff

### **6. Intermediate Hebrew. \***

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(s): course 5. Students interested in this course who have not taken the prerequisite should meet with the instructor prior to the first class meeting. (General Education Code(s): IH.) The Staff

### **80. Introduction to Biblical Hebrew. \***

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 will be applying their emergent skills to translating a variety of biblical texts. (General Education Code(s): T4-Humanities and Arts.) The Staff

### **94. Group Tutorial. F,W,S**

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. May be repeated for credit. The Staff

### **99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# HISTORY

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2015-16 General Catalog

201 Humanities

(831) 459-2982

<http://history.ucsc.edu/>

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## PROGRAM DESCRIPTION

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History is the attempt to understand the meanings of the human life experience, not generally and abstractly, but in terms of specific individuals, events, and circumstances. Consequently, of all academic pursuits, it is the one best equipped to help us locate phenomena in their specific contexts, whether we are concerned with political events, social changes, the production of art, the development of technologies, scientific discoveries, or life stories. In this sense, the study of history can also be an invaluable complement to any other major.

The history program at UCSC is designed to bring about an understanding of the ideas, experiences, and events that have shaped this country and the world at large. The program's main emphases are in social and cultural history, with additional strengths in intellectual and political history.

A degree in history opens up a wide range of career possibilities. Some careers fall within the historical profession, including teaching at the university, college, and high school levels and working in various areas of public and applied history, such as historic preservation, archives, libraries, and museums. For careers in fields as diverse as law, business, government, foreign service, publishing, journalism, and communications, a degree in history lays the foundation in research, analytic, and writing skills upon which later professional training can be built.

Evaluate competing interpretations and multiple narratives of the past.

### **Research and Evidence**

Gather and assess primary historical evidence.

Compile a bibliography.

### **Collaboration**

Provide constructive and effective critiques of each other's work.

Complete a shared research project.

### **Communication**

Present clear and compelling arguments, based on critical analysis of diverse historical sources, and effectively communicate historical interpretations in written essays and/or other media.

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

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## PROGRAM LEARNING OUTCOMES

Students who complete the history major should graduate with the following knowledge and skills:

### **History**

Command of historical events and historiographic debates in a specific region of the world.

### **Critical Reading**

Gather and critically engage primary and secondary sources.

Understand and evaluate historical ideas, arguments, and points of view.

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## REQUIREMENTS FOR THE MAJOR

A minimum of 12 courses is required for the major. No more than four of the minimum 12 courses may be lower division. A minimum of 40 upper-division units must be completed within the history major course requirements. The history major does not require an examination for entrance and does not limit the number of students accepted into the program. It is strongly advised that students complete at least one introductory history course before declaring the major.

## History

At UCSC, the history curriculum offers three broad, geographically defined regions of concentration:

- the Americas and Africa
- Asia and the Islamic World
- Europe

Each history major selects one of the three regions of concentration listed above as their area of emphasis. In consultation with the history undergraduate program coordinator, the student plans a program of study that will also fulfill the following distribution of courses:

### COURSE REQUIREMENTS

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#### **Region of Concentration (5 courses, plus 1 comprehensive requirement)**

I. At least one lower-division survey course within their chosen region of concentration.

- Americas/Africa: History 10A, 10B, 11A, 11B, or 30
- Asia/Islamic World: History 40A, 40B, 41, or 44
- Europe: History 65A, 70A, or 70B

Transfer coursework may or may not apply toward the survey course requirement; consult the history undergraduate program coordinator.

II. Four additional courses in the region of concentration, three of which must be upper-division

III. One comprehensive (exit) requirement: All students must complete either a research/readings seminar (HIS 190, 194, or 196), or a senior thesis (HIS 195A and 195B) in their area of concentration. Detailed information on the comprehensive exit requirement can be found below.

#### **Breadth Requirements (4 courses)**

IV. Two courses from each of the remaining two regions of concentration.

#### **Historical Skills and Methods (1 course)**

V. HIS 100, Historical Skills and Methods

#### **Elective Requirement (1 course)**

VI. One upper-division history elective from any of the three regions of concentration.

Students often choose to satisfy the history major course requirements listed above according to some general theme of special interest to them. Faculty and staff advisers will assist the students who choose this option with their course selection.

**Distribution requirements.** Among the 12 courses required for the major, at least three must meet chronological distribution requirements. One must be set before 600 A.D., and two must be set in periods prior to the year 1800 A.D.

**Interdisciplinary coursework.** The History Department encourages its majors to take upper-division courses in disciplines related to history, including sociology, literature, community studies, American studies, politics, Latin American and Latino studies, and others. Students who wish to substitute one such appropriate upper-division course for the history elective must obtain approval from the History Department. These courses are subject to the limitations described below under the "Transfer credits and substitutions" section.

**Comprehensive requirement.** A comprehensive exit requirement in the student's chosen region of concentration can be fulfilled by completing an exit seminar (one quarter: 190-series, 194-series, or 196-series) or a thesis (two quarters: courses 195A and 195B). Please consult the department web site for a more detailed description of these courses.

**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 exit requirement in their chosen region of concentration. Students may complete an exit seminar (one quarter: 190 series, 194 series, or 196 series) or a thesis (two quarters: courses 195A and 195B). Please consult the department web site for a more detailed description of these courses and refer to updated DC information at [Disciplinary Communication Chart](#).

In addition to all coursework, history majors must complete a senior check and exit survey in the first quarter of their senior year. Students who do not submit their senior check for review may have their graduation date delayed. Please consult the department web site for a more detailed description.

**Honors in the history major.** 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 UCSC; 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

## History

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.

**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.

**UC Education Abroad Program.** All history students are encouraged to consider studying abroad. UCEAP offers students an opportunity to study abroad in 40 countries with more than 300 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 year-long program options. Subject to the limitations described below under "Transfer credits and substitutions," up to three courses in history completed through EAP may be applied toward major requirements. Consult the History Department web site, and speak with the undergraduate program coordinator for further details.

**Transfer credits and substitutions.** A minimum of five regularly scheduled history courses plus the comprehensive requirement must be taken from members of the UCSC history faculty. Subject to the limits indicated in parentheses, courses from the following categories may also be applied to the history major:

- Transfer courses taken at another institution (limit of 3)
- Education Abroad Program (limit of 3)
- UCDC (limit of 2)
- UC in Sacramento (limit of 2)
- Related upper-division courses taken in another UCSC department (limit of 1)
- Independent and field studies (limit of 1)

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## REQUIREMENTS FOR THE MINOR

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Students whose major area of interest is not history may nonetheless find that a minor in history makes an invaluable contribution to their studies. For the minor in history, eight history courses, five of which must be

upper division, are required. There is no senior comprehensive requirement for the minor.

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## GRADUATE PROGRAM

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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.

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## RESEARCH AND TEACHING

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In preparing graduate students for research and teaching at the university level, the department offers training in four geographically and chronologically defined fields: U.S. history, European history since 1500, East Asian history since 1600, and world history since 1500. U.S., European, and East Asian history are defined as primary teaching fields; each graduate student is required to choose one. Students of U.S. history may incorporate Latin American history in their coursework. Every year the faculty in each field offer introductory readings seminars and classes on more specific topics (see below for information about course offerings). Each graduate student also prepares a second teaching field different from the primary field and can choose from among U.S., European, East Asian, or world history. Ph.D. students may also petition the graduate committee to prepare a secondary teaching field in African or Latin American history.

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## RESEARCH CENTERS AND CLUSTERS

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The History Department has created a series of thematic research clusters to coordinate the training of graduate students in historical research. Each research cluster is composed of History Department faculty and graduate students as well as faculty outside the department who share broad scholarly interests. The clusters serve as a way to coordinate the research of faculty and graduate students whose work encompasses different geographic regions and chronological periods. Although the nature and number of the research clusters may change over time, the department currently offers two basic groupings: 1) colonialism; 2) gender and history.

## History

These clusters are complemented by scholarly activities sponsored by various UCSC Centers. Centers that are currently directed by UCSC History faculty are: the Center for Jewish Studies, the Center for the Study of Pacific War Memories, and the Working Group on the Study of Children. For information on current research clusters, please visit the Institute for Humanities Research web site, [ihr.ucsc.edu](http://ihr.ucsc.edu).

The faculty of each cluster provide at least one research seminar every other year in addition to readings courses. All the affiliated graduate students must take at least one research seminar during their first two years; they are encouraged to take more than one. Faculty and graduate students also participate in interdisciplinary forums outside the department.

These include programs sponsored by the Chicano/Latino Research Center, the Center for Cultural Studies, and the UCSC Institute for Humanities Research. Advanced graduate students may also have the opportunity to work in programs sponsored by the University of California Humanities Research Institute at UC Irvine. Finally, multi-campus groups in which students and faculty are involved include the Bay Area Seminar in Early American Studies, the Bay Area Pre- and Early Modern Studies Group at UC Berkeley, and the French Studies Group at Stanford.

### COURSES

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Until they pass the qualifying examination and are formally advanced to candidacy for the Ph.D. degree, students must be in residence at UCSC and are expected to complete a minimum of 12 credits each quarter to maintain normal academic progress. Completion of a minimum of 12 courses of 5 credits each (in addition to History 280A, 280B, and 280C) is required for advancement to candidacy. Courses taken are graduate seminars, independent study courses, and most upper-division undergraduate courses.

Students are required to take the following before advancing to candidacy:

- History 200 (year 1, fall quarter); History 201 (year 2, winter quarter); History 202 (year 1 or 2); History 280A (year 1, fall quarter) 280B (year 1 or 2), 280C (year 1 or 2);
- one research seminar during the first four quarters: History 204A, or 204C, or 204E;
- second teaching field: two courses in American, European, East Asian, or world history;
- outside courses: two quarters of graduate coursework outside the History Department;
- readings courses in the appropriate field: East Asia—History 230A, 230B, 230C (China) or History

242, 243, 244 (Japan); Europe—History 251A, 251B; U.S.—History 210A, 210B.

Graduate students in East Asian history specialize in either modern Chinese or modern Japanese history, but all students in the East Asian program will be prepared to teach both. The core curriculum for East Asian history consists of three China reading seminars (courses 230A, 230B, 230C) and three Japan reading seminars (courses 242, 243, 244) taught in sequence over three years, covering such topics as foundational historiographies, gender, social movements, and transnational circulation of people, commodities, and ideas. Over the course of the three years to the qualifying examination, China students will be expected to take all three China seminars and at least two of the three Japan seminars. Japan students will be expected to take all three Japan seminars and at least two of the three China seminars. Additional coursework in research methods as well as occasional independent studies will also be available, and students are encouraged to take classes that have a wide range of faculty in other departments across the campus.

### FOREIGN LANGUAGE REQUIREMENT

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No prior foreign language preparation is required for admission with a primary teaching field in U.S. history. Two to three years of college work, or its equivalent, in at least one foreign language is required for admission to the European program. Students who choose East Asian history as their primary teaching field will be required to have completed at least three years of college-level Chinese or Japanese prior to admission; more years are recommended. Depending upon the student's intended field of research, Japanese language study may also be required of China specialists as part of the graduate program of study.

Students with a primary teaching field in U.S. history are expected to demonstrate a reading competency in at least one foreign language prior to taking the Ph.D. qualifying examination. Students in all other teaching fields must demonstrate a reading competency in at least two foreign languages prior to taking the Ph.D. qualifying examination; 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 believe that they have already demonstrated competency through previous coursework or through their performance on a standardized test should petition the graduate director.

## History

### M.A. DEGREE

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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 6 courses of 2 credits each, demonstrated competency in one foreign language (for those in primary teaching fields other than U.S. history), removal of all Incomplete notations (I) on record, and approval of a M.A. essay of 25-30 pages.

### The M.A. Essay

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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 course 201, Directed Research Colloquium, the winter quarter of their second year. While taking course 201, students work intensively with a faculty reader in the preparation, crafting, and revising of the essay. The final draft, approved by the reader, must be submitted to the graduate committee by the spring quarter deadline (usually mid-April). The deadline will be noted in the department's call for M.A. essays.

### Qualifying Examination

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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 normally taken by the spring quarter of the third year, but no later than the end of the 11th quarter of residency. 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.

The four examination fields are designed in consultation with the student's QE committee members. Students prepare for the examination through regularly offered courses and independent readings courses sponsored by the examiners. Students are required to take at least two courses in each of the four fields. The fields are as follows:

- **Primary Field of Concentration.** One of three fields: American history; European history 1500 to the present; East Asian history 1600 to the present.
- **Research Field.** Normally a subfield of the primary field with a focus on the student's specific area of research interests. This field is most closely connected to the student's work in a specific research cluster.
- **Second Teaching Field.** Chosen from the above list of primary fields, with the addition of world history, or, where appropriate, a comparative, thematic field such as gender, colonialism, Latin American, or African.
- **Outside Field.** One field outside history, such as anthropology, feminist studies, history of art and visual culture, Latin American and Latino studies, literature, philosophy, politics, sociology, or history of consciousness. Students select a field of topical, thematic, or methodological relevance to their dissertation. The student's faculty adviser must approve the outside field.

The four examination fields must be defined and preliminary reading lists (see below) filed with the department no later than the student's eighth quarter of residency.

A pass or fail will be given after the examination based on the student's knowledge and research preparation as demonstrated by his or her dossier. All areas must receive passing marks from all members of the committee. Immediately following the exam, the QE committee will complete and submit to the History Department the Report on Qualifying Examination form. 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.

### Qualifying Examination Dossier Requirements

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The QE dossier includes four parts, each of which should be prepared in consultation with the student's primary academic adviser and with the advice of the examiners. The examination will focus upon the dossier. All examiners, including the examiner from outside the department, will participate in all segments of the examination.

The dossier includes:

1. An essay (15-20-pages) reviewing the state of the scholarship in the student's primary field of concentration. This essay should reflect the student's general, broad competence in his or her field as well as a mastery of the theoretical issues and historiographic debates in four to five areas that represent their primary area of expertise. The essay may reflect the

## History

thematic focus of a research cluster as well as work completed in an outside field (literature, anthropology, etc.).

2. One syllabus or, at most, two syllabi (the number to be decided in discussion with the student's primary adviser) that demonstrates the student's preparation to teach across the breadth of their primary field at the introductory level. The syllabus 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 syllabus (annotated in the same fashion as described in section number 2 above) in the student's second teaching field, accompanied by a brief (three- to five-page) statement of principal issues. The exact content of these items will be decided in consultation with the examiner in the secondary teaching field.

4. A 10-15 page dissertation prospectus that includes an evaluative survey of the literature relevant to the student's proposed research topic, a detailed discussion of the archival resources, and a consideration of the theoretical issues to be engaged. The prospectus lays out, in reasonable detail, the direction of research the student intends to pursue for the dissertation. The prospectus includes the following information:

- three- to four-page description of the overall argument of the project, including a discussion of the research base and the appropriate methodological/theoretic models;
- a detailed discussion of the archival resources;
- two- to three-page outline, tracking the research and analysis chapter by chapter;
- substantive bibliography with complete citations.

### Note:

- Although no specific segment 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 research prospectus.
- Complete bibliographies must be appended to each piece of the QE dossier.

## Dissertation

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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 (and explicit rejection of) appropriate interpretive models.

## M.A. IN HISTORY (TERMINAL)

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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 four areas of specialization (U.S., Europe, East Asia, world). To complete the degree, each student must pass a total of 12 courses of 5 credits each and six courses of 2 credits each including courses 280A, 280B, and 280C. Students must also write an M.A. paper of 25-30 pages. For students specializing in Europe, U.S., and East Asia, the curriculum will be nearly identical to that taken by Ph.D. students in their first two years, except that there will be no language requirement. Those specializing in world history will take History 202 and two other courses from the world history list instead of the corresponding courses in other fields. Otherwise their curriculum will be the same as that of a typical incoming Ph.D. student.

## Course Requirements

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- History 200 (year 1, fall quarter); History 201 (year 2, winter quarter)
- one research seminar during the first four quarters: History 204A, 204C, or 204E.
- six courses of 2 credits each including History 280 (year 1), 280B (year 1 or 2), 280C (year 1 or 2)
- seven electives of 5 credits each, two of which can be taken outside the History Department. Courses taken are graduate seminars, most upper-division undergraduate courses, and independent study courses.
- two reading seminars in the area of specialization:
  - U.S.: History 210A, 210B
  - Europe: History 251A, 251B
  - World: History 202 and two other courses from the world history list
  - East Asia: History 230A, 230B; 230C, 242

Further details about the graduate program are available from the Department of History web site: <http://history.ucsc.edu>.

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## HISTORY FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**Dilip K. Basu, Emeritus**

**Jonathan F. Beecher, Emeritus**

**David Brundage**

American immigration history, with particular focus on the Irish in America and on transnational immigrant politics; U.S. labor and social history; modern Irish history

**Edmund Burke III, Emeritus**

**Pedro G. Castillo, Emeritus**

**Mark Cioc**

German history, modern European history, environmental history

**Nathaniel Deutsch**

Modern Jewish history; Eastern European Jewish culture; ethnography, Hasidism; history of religions

**Dana Frank**

Late 19th- and 20th-century U.S. social history, including women's, labor, and working-class history, race and ethnicity; modern Honduras; U.S. history in transnational perspective

**Lisbeth Haas**

U.S.-Mexico borderlands and border studies, Chicano and Native American history; visual culture in the colonial Americas; California; historical memory, theory, and historical methodology

**Charles W. Hedrick Jr.**

Greek and Roman history

**Gail B. Hershatter**

Modern Chinese social and cultural history; labor history; gender history; history of sexuality; feminist theory; history, memory, and nostalgia

**Emily Honig**

Gender, sexuality and ethnicity in modern China; comparative labor and urban history

**Peter Kenez, Emeritus**

**Bruce Levine, Emeritus**

**Gary B. Miles, Emeritus**

**Eric Porter**

Black cultural and intellectual history; US cultural history and cultural studies; critical race and ethnic studies; popular music and jazz studies; black radicalism; urban studies

**Buchanan Sharp, Emeritus**

**Tyler Stovall**

Modern France, modern Europe, labor history, urban history, transnational history, colonial and post-colonial history, history of the African diaspora

**David G. Sweet, Emeritus**

**Mark Traugott, Emeritus**

**Marilyn J. Westerkamp**

Colonial and revolutionary America; the Atlantic World; early modern cultural and religious history; U.S. religious history; gender studies; history of the body

### ASSOCIATE PROFESSOR

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**David Henry Anthony III**

African and African American history, art, music, literature, and cinema; eastern and southern Africa; African vernacular expression; Black Atlantic; Indian Ocean world; African and African American linkages; Islamic civilization; African diaspora studies; African Sufism; African religion; missiology, liberation theology; world history

**Noriko Aso**

Japanese social, intellectual, and cultural history, material culture, colonialism, nationalism, gender, race and ethnicity

**Alan S. Christy**

Early modern and modern Japan; history of social sciences, colonialism, nationalism; Okinawa

**Grace Peña Delgado**

Chicano/a History; Mexico-US-Canadian Borderlands; Latino/a Studies; Asian and Asian American Studies; Immigration; Gender and Sexuality; Modern Mexico and Latin America

**Maria Elena Diaz**

Atlantic world, Colonial Latin America and the Caribbean, Cuba; social and cultural, global and local histories; colonialism, slavery and freedom, race/ethnicity, gender and class; legal, political, popular, and religious culture

**Minghui Hu**

Early Modern China (1600–1900)

**Amy Lonetree**

Indigenous history; museum studies; memory and history; Native American cultural production; public history; and Ho-Chunk tribal history

**Catherine A. Jones**

U.S. civil war and Reconstruction; slavery and emancipation; the American South; history of children; history of education; women and gender

## History

### **Matthew D. O'Hara**

Colonial and modern Latin America; Mexico; religion; race, ethnicity, and identity; political culture; history of time

### **Gregory O'Malley**

Slavery and the slave trade; the colonial Americas; the Atlantic World; race, ethnicity, and encounters; Native American history; revolutionary America

### **Cynthia Polecristi**

Medieval, Renaissance, and Modern Italy, Mediterranean urban and cultural history, ritual and popular devotion

### **Alice Yang**

Historical memory, Asian American history, gender history, race and ethnicity, 20th-century U.S., oral history

### **Assistant Professor**

#### **Jennifer Derr**

Colonial and Post-colonial Middle Eastern history; Egypt; agricultural and environmental history; Ottoman history; spatial politics; African history; Islamic history; history of science; history of medicine

#### **Alma Heckman**

Modern Jewish history; North Africa and the Middle East; labor history; transnational Jewish political activism; colonialism; nationalism; syncretism

#### **Marc Matera**

Britain and the British Empire; Modern Europe; world history; Atlantic World; western Africa; African diaspora studies; colonialism; race/ethnicity, gender, and sexuality

#### **Maya Peterson**

Russian and Soviet history; environmental history; comparative empire; colonialism; global exchanges of scientific knowledge and expertise; technology transfer; historical geography, spatial history and mapping, Central Asia; Silk Roads

#### **Juned Shaikh**

Modern South Asian social and cultural history, urban history, labor history, history of caste, Dalit studies, intellectual history, development studies, social theory, and agrarian studies

#### **Elaine Sullivan**

Pharaonic Period Egypt; Greek and Roman Egypt; women and gender; material culture; ritual landscape; 3D modeling; Digital Humanities and the use of emerging technologies in studying the ancient world

## LECTURER

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### **Gildas Hamel, Emeritus**

#### **Matthew Lasar**

U.S. and international political, social, and economic history; broadcasting and telecommunications

#### **Jennifer K. Lynn**

Later Roman Republic and Principate; Homeric epic; Hellenistic and Augustan poetry; the lives of the women in the ancient world

#### **Bruce Thompson**

European intellectual and cultural history, Jewish intellectual and cultural history, French history, British and Irish history, history of cinema, history of espionage and intelligence, urban history, and environmental history



## PROFESSOR

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### **Bettina Aptheker (Feminist Studies)**

Feminist oral history and memoir; feminist pedagogy; African-American feminist history; queer studies; feminist Jewish studies; feminist critical race studies

### **Christopher Connery (Literature)**

World literature and cultural studies, globalism and geographical thought, the 1960s, Marxism, pre-modern and modern Chinese cultural studies, cultural revolution

### **John Dizikes, Emeritus (American Studies)**

### **Barbara L. Epstein, Emerita (History of Consciousness)**

### **Sharon Kinoshita (Literature)**

Mediterranean studies; medieval francophone and Mediterranean literature; literature, translation, and empire; postcolonial and globalization theory; Marco Polo; world literature and cultural studies

### **Paul M. Lubeck, Emeritus (Sociology)**

### **Daniel Selden (Literature)**

Afroasiatic languages and literatures, Greek and Latin, Hellenistic culture, the classical tradition, history of criticism, literary theory

## ASSOCIATE PROFESSOR

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### **Gabriela Arredondo (Latin American and Latino Studies)**

U.S. social and cultural history; Chicana/o history; critical race and ethnicity theories; im/migration history; Latina/os in the U.S.; Chicana feminisms; "borderlands" studies, modern Mexico history

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## HISTORY COURSES

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### LOWER-DIVISION COURSES

#### **2A. The World to 1500. \***

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. (General Education Code(s): CC, IH.) The Staff

#### **2B. The World Since 1500. W**

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. (General Education Code(s): CC, IH.) M. Matera

#### **7. Archives and Public History. \***

Through readings on local history topics and bi-weekly field expeditions, students discover different types of archives and historical repositories, the diversity of sources that they contain, and the varied uses to which they can be put. Course also explores the range of career opportunities open to history majors (sometimes loosely grouped together under the rubric "public history"). Students are billed a materials fee. Enrollment limited to 35. The Staff

#### **9. Introduction to Native American History. S**

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. (Formerly Introduction to Native American Studies.) (General Education Code(s): ER.) A. Lonetree

#### **10A. United States History to 1877. S**

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. Satisfies American History and Institutions Requirement. (General Education Code(s): ER, IH.) M. Westerkamp

#### **10B. United States History, 1877 to 1977. W**

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. Satisfies American History and Institutions Requirement. (General Education Code(s): ER, IH.) M. Lasar

#### **11A. Latin America: Colonial Period. W**

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. (General Education Code(s): CC, IH, E.) M. Diaz

#### **11B. Latin America: National Period. F**

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. (General Education Code(s): CC, IH, E.) M. O'Hara

#### **12. Introduction to Latino American History. S**

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. (General Education Code(s): ER.) G. Delgado

#### **13. Introduction to American Religious Culture. \***

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

## History

utopianism, the rise of evangelicalism, religion and reform, manifest destiny, secularization and modernity, and the intersection of politics and religion. (General Education Code(s): TA, IH.) M. Westerkamp

### **14. Race and Ethnicity in the U.S.** \*

An introductory course on the racial/ethnic history of the U.S. Of central concern are issues of race, ethnicity, oppression, resistance, mass migrations, city life in urban America, and power and protest in modern America. Priority enrollment to freshmen and sophomores. (General Education Code(s): ER, IH, E.) The Staff

### **30. The Making of Modern Africa.** **W**

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. (General Education Code(s): CC, IH, E.) D. Anthony

**40A. Early Modern East Asia. F**  
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. (General Education Code(s): CC, IH, E.) M. Hu

### **40B. The Making of Modern East Asia. W**

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. (Formerly course 40.) (General Education Code(s): CC, IH, E.) The Staff

### **41. The Making of the Modern Middle East. \***

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. (General Education Code(s): CC, IH, E.) J. Derr

### **42. Student-Directed Seminar.** **F,W,S**

Seminars taught by upper-division students under faculty supervision. (See course 192.) The Staff

### **44. Modern South Asia, 1500 to Present. S**

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. J. Shaikh

### **50. Introduction to the History of Ancient Egypt. S**

Introduces the political and social history of ancient Egyptian civilization from the Predynastic through the end of the Pharaonic period. (General Education Code(s): CC.) E. Sullivan

### **61. Classical Mythology. \***

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. C. Hedrick

### **62A. Classical World: Greece. F**

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.). (General Education Code(s): CC, IH.) C. Hedrick

### **62B. Classical World: Rome. \***

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. (General Education Code(s): CC, IH.) C. Hedrick

### **63. Women in the Ancient World.** **W**

Examines the lives of women in the ancient Greco-Roman world. Most readings are from primary texts (i.e., ancient sources), literary, historical, and documentary; material and artistic evidence also is considered. (General Education Code(s): CC.) J. Lynn

### **65A. Medieval Europe: 200-1000.** \*

A survey of Europe from the third through 10th centuries. Emphasizes cultural conflict and assimilation (Roman and Germanic, pagan and Christian, East and West). Topics include the rise of Christianity, Germanic migrations, Byzantium and Islam, the cult of saints and relics, Vikings, and gender roles. (General Education Code(s): CC, IH.) C. Polecristi

### **70A. Modern European History, 1500-1815. F**

Surveys the economic, social, cultural, and political history of Europe since the late 15th century: 1500-1815. Course 70A is not a

## History

prerequisite to course 70B. (Formerly Modern European History, 1500-1789.) (General Education Code(s): CC, IH.) The Staff

### **70B. Modern European History, 1815-present. S**

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. (Formerly Modern European History, 1789-1914.) (General Education Code(s): CC, IH.) B. Thompson

### **74. Introduction to Jewish History and Cultures. \***

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. (General Education Code(s): ER.) N. Deutsch

### **75. Film and the Holocaust. S**

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. (General Education Code(s): ER, E.) M. Cioc

### **80H. Class, Gender, and Community in China, 1700-Present. \***

Examines gender, sexuality, and family across classes in late imperial China, and the transformation of all three by revolution (and vice versa). Concentrates throughout on gender as a category of historical analysis that has remained largely invisible in the construction of conventional Chinese history. (General Education Code(s): CC, T4-Humanities and Arts, E.) G. Hershatter

### **80N. Gender, Labor, and Feminist Productions. F**

Examines how constructions of gender and intersecting constructions of race, class, and sexuality define the power of women differentially in the world of work. Beginning with the history of emancipation, traces the broader constructions of paid and unpaid labor in the 20th-century U.S. Traces the specific histories of transgender women workers, specific regional and industrial histories, and those marked by the meaning given to African, Asian, Euro-, indigenous, and Mexican descent in the construction of gender and work. Uses feminist methodology and contemporaneous visual and written work by women artists and filmmakers. (Formerly "Topics in U.S. Women's History: Women at Work.") (General Education Code(s): CC, T4-Humanities and Arts.) L. Haas

### **80X. Civil Rights Movement: Grassroots Change and American Society. F**

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. (Formerly Community Studies 80B) (General Education Code(s): ER, T3-Social Sciences, E.) D. Brundage

### **80Y. World War II Memories in the U.S. and Japan. \***

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. (General Education Code(s): CC, T4-Humanities and Arts, E.) A. Christy, A. Yang

### **99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

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UPPER-DIVISION COURSES

### **100. Historical Skills and Methods. F,W,S**

Designed to train students in the fundamental skills required for advanced historical research. Students read historical theory and learn the basics of historical analysis, research, and disciplinary writing. Recommended to majors but open to all interested students. (General Education Code(s): TA.) M. O'Hara, M. Peterson, C. Jones

### **100A. Digital History. W**

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. Enrollment restricted to junior and senior history, Jewish studies, German studies, and classical studies majors. Enrollment limited to 20. E. Sullivan

## History

### **101A. The Making of the Modern World, 1400-1750. \***

Focuses on the transformation of many different societies of Asia, Africa, and the Americas from 1400 to 1750 through case histories and the comparative study of European colonial hegemony, labor systems, global economic exchange, missions, and warfare. (General Education Code(s): CC, E.) The Staff

### **101B. The Making of the Modern World, 1750-1950. \***

The history of the world from 1750. Focuses on the liberal project (the industrial and democratic revolutions) and its impact on the world—slavery and abolition, self-strengthening movements, race and class, imperialism, colonialism, and nationalism. (General Education Code(s): CC, E.) The Staff

### **101C. Oceans in World History. \***

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. (General Education Code(s): CC.) M. Matera

### **101D. Topics in the World History of Science. \***

Detailed consideration of some specific topic or period in the history of science and technology with significant global implication. Topic varies from year to year. Examples include: Copernicanism, Darwinism, climate change, and military technology. (Formerly course 142, World History of Science ) May be repeated for credit. (General Education Code(s): SI.) M. Hu

### **104C. Celluloid Natives: American Indian History on Film. \***

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. (Formerly American Studies 123M.) (General Education Code(s): IM, E.) A. Lonetree

### **104D. Museums and the Representation of Native American History, Memory, and Culture. F**

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. (Formerly American Studies 136.) (General Education Code(s): ER, E.) A. Lonetree

### **105. Nations and Nationalism. S**

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. (General Education Code(s): CC.) The Staff

### **106A. Vietnam War Memories. \***

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. (General Education Code(s): CC, E.) A. Yang

### **106B. Asian and Asian American History, 1941-Present. S**

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. (General Education Code(s): ER, E.) A. Yang

### **107. Religion and Modernity. \***

Explores the impact of modernity on a variety of religious traditions. Examines the rise of secularism and the phenomenon of disenchantment; the "invention" of religion; and the emergence of fundamentalism in the modern period. (General Education Code(s): CC.) N. Deutsch

### **108. Social Movements in Historical Perspective. \***

Readings examine 18th- through 20th-century social movements and related phenomena in Europe/America: examples include Tulipomania; revolutionary action in France; U.S. Civil Rights movement; and the environmental and feminist movements. Lectures focus on social science frameworks used to explore the social base, tactics, success or failure, and inter-relationships of social movements as a distinctive mode of social change. The Staff

### **109A. Race, Gender, and Power in the Antebellum South. \***

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. (General Education Code(s): ER, E.) C. Jones

## History

### **110A. Colonial America, 1500-1750. \***

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. Satisfies American History and Institutions Requirement. (General Education Code(s): ER.) M. Westerkamp

### **110B. Revolutionary America, 1740-1815. W**

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. Satisfies American History and Institutions Requirement. G. O'Malley

### **110D. The Civil War Era. F**

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. C. Jones

### **110E. Rise of the Machines: Technology, Inequality, and the United States, 1877 to 1914. S**

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? (Formerly What Is a Nation? The U.S. from 1877 to 1914.) Satisfies

American History and Institutions Requirement. M. Lasar

### **110F. World War USA: The United States from 1914 through 1945. \***

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. (Formerly Crossroads for American Capitalism: The U.S., 1914 to 1945.) M. Lasar

### **110G. Age of Extremes: The United States During the Cold War, 1945 to 1991. F**

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 The U.S. After the Second World War.) M. Lasar

### **110H. Greater Reconstruction: Race, Empire, and Citizenship in the Post-Civil War United States. \***

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. Satisfies American History and Institutions Requirement. (General Education Code(s): ER.) C. Jones

### **111. Popular Conceptions of Race in U.S. History, 1600-Present. \***

Explores how race has been constructed and perceived, examining Americans' use of race to describe themselves and to label others. Particularly concerned with ordinary people and how and why

their ideas of race have changed over time. (General Education Code(s): ER, E.) G. O'Malley

### **112. American Feminist Thought, 1750-1950. \***

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. M. Westerkamp

### **113C. Women and American Religious Culture. \***

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. M. Westerkamp

### **114. Market Revolution in Antebellum U.S.. \***

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). C. Jones

### **115A. U.S. Labor History to 1919. S**

Explores the history of work, working-class people, and the labor

## History

movement in the U.S., with attention to race and gender dynamics as well as to the development of workers' organizations. (Formerly U.S. Labor History, Colonial Period to 1919.) Satisfies American History and Institutions Requirement. (General Education Code(s): ER.) D. Frank

### **115B. U.S. Labor History, 1919 to the Present. \***

Explores the history of work, working-class people, and the labor movement in the U.S. in global perspective with attention to race and gender dynamics and political-economic changes. Satisfies American History and Institutions Requirement. (General Education Code(s): ER.) D. Frank

### **115C. Learning from the U.S. Great Depression. \***

Examines U.S. society, politics, and culture during the 1930s, with emphasis on the relationship between social movements and public policy, and dynamics of race, ethnicity, immigration, and gender, and dynamics between labor, business, and the state. D. Frank

### **116. Slavery Across the Americas. \***

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. Satisfies American History and Institutions Requirement. (General Education Code(s): ER.) G. O'Malley

### **117. Wired Nation: Broadcasting & Telecommunications in the US from the Telegraph to the Internet. \***

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. M. Lasar

### **117A. From the Player Piano to Pandora. \***

Explores the history, culture, and politics of the distribution of recorded and live sound from the 1870s through the present. M. Lasar

### **118. The Global Cold War, 1945-1991. S**

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. M. Lasar

### **120. W.E.B. Du Bois. \***

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. (General Education Code(s): ER.) E. Porter

### **121A. African American History to 1877. F**

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. (General Education Code(s): ER, E.) D. Anthony

### **121B. African American History: 1877 to the Present. W**

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. (General Education Code(s): ER, E.) D. Anthony

### **122A. Jazz and United States Cultural History, 1900-1945. W**

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. (General Education Code(s): IM.) E. Porter

### **122B. Jazz and United States Cultural History, 1945 to the Present. \***

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. (General Education Code(s): IM.) E. Porter

### **123. Immigrants and Immigration in U.S. History. W**

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. (General Education Code(s): ER.) D. Brundage

## History

### **124. American Empire. \***

Examines U.S. expansion and subsequent ascent to global power. In tracing the presence of the U.S. in different areas of the world during the 20th century, course considers the ideas, politics, gender, and social relations that have influenced imperial aspirations. L. Haas

### **125. California History. W**

California had a multi-ethnic indigenous society for centuries. Course traces the persistent multi-ethnic quality of the region as it became part of the Spanish empire, Mexico, and the United States. Considers the many diasporas that have shaped California's steady connection to the world, especially to Mexico and other nations that border the Pacific. (Formerly California History.) (General Education Code(s): ER.) L. Haas

### **126. From Indigenous Colonial Borderlands to the U.S.-Mexico Border. \***

Examines the interactions and integration of indigenous people and settlers in the Southwest U.S. and Northern Mexico from a region defined by its indigenous colonial borderlands to national borders. Explores the connections between the U.S. and Mexico. Within the deeply cross-cultural region studied, also examines the particular histories of states, indigenous peoples, and Mexican-origin groups and regions. (Formerly History of the Southwest: Colonial Period to 1920.) (General Education Code(s): ER, E.) L. Haas

### **128. Chicana/Chicano History. W**

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. Satisfies American History and

Institutions Requirement. (General Education Code(s): ER, E.) G. Delgado

### **130. History of Modern Cuba. F**

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. (General Education Code(s): E.) M. Diaz

### **131. Women in Colonial Latin America. S**

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. (Formerly Women in Latin America.) M. Diaz

### **134A. Colonial Mexico. \***

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. (Formerly History of Mexico, 1500–1850.) (General Education Code(s): ER, E.) M. O'Hara

### **134B. History of Mexico, 1850 to Present. S**

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. (General Education Code(s): CC, E.) M. O'Hara

### **137A. Africa to 1800. \***

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. (General Education Code(s): CC, E.) D. Anthony

### **137B. Africa from 1800 to the Present. \***

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 subsaharan Africa. Some background knowledge of Africa helpful. (General Education Code(s): CC, E.) D. Anthony

### **137C. African Cinema. \***

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

## History

Africa viewed. Prerequisite(s): course 30 or 137A or 137B, or by permission of instructor. (General Education Code(s): CC, E.) D. Anthony

### **140B. History of Qing China, 1644-1911. S**

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. (General Education Code(s): CC.) M. Hu

### **140C. Revolutionary China 1895-1960. F**

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. (General Education Code(s): CC, E.) E. Honig

### **140D. Recent Chinese History. \***

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. (General Education Code(s): CC, E.) G. Hershatter

### **140E. Women in China's Long 20th Century. W**

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? (General Education Code(s): CC.) G. Hershatter

### **141A. Classical Chinese Culture and Literature, 10th Century B.C.E. through Sixth Century C.E. \***

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. Satisfies the Pre- and Early Modern and World Literature concentrations; also satisfies the Global, Poetry, and Pre- and Early Modern distribution requirements. (Also offered as World Lit & Cultural Studies 135. Students cannot receive credit for both courses.) (General Education Code(s): E.) C. Connery

### **141B. Classical Chinese Culture and Literature, Sixth Century through 16th Century. \***

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. Satisfies the Pre- and Early Modern Studies and World Literature concentrations; also satisfies the Global, Poetry, and Pre- and Early Modern distribution requirements. (Also offered as World Lit & Cultural Studies 136. Students cannot receive credit for both courses.) (General Education Code(s): E.) C. Connery

### **145. Gender, Colonialism, and Third-World Feminisms. \***

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. (General Education Code(s): E.) E. Honig

### **146A. Colonial South Asia 1750-1947. F**

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. J. Shaikh

### **147A. History of Premodern India. \***

A study of religions (Vaisnavism, Tantrism, Islam, Sikhism), art, literature, and social movements in their historical contexts from 1000 A.D. to 1800. (General Education Code(s): CC, E.) The Staff

### **147B. Political and Social History of Modern South Asia. \***

Social, political, and religious movements in the colonial and postcolonial contexts of the 19th and 20th centuries in modern and contemporary South Asia. (General Education Code(s): CC, E.) The Staff

### **147C. South Asia in the 20th Century. \***

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. (General Education Code(s): CC.) J. Shaikh

**150A. Ancient Japan. S**

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. (General Education Code(s): CC.) The Staff

**150B. Tokugawa Japan. \***

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. A. Christy

**150C. Modern Japan. W**

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. (General Education Code(s): CC, E.) The Staff

**150D. The Japanese Empire, 1868-1945. \***

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. A. Christy, N. Aso

**152. Trade and Travel on the Silk Roads. F**

Introduction to two millennia of history along the ancient trade routes popularly known as the "Silk Road." These routes carried precious goods between Asia and Europe, while also serving as important conduits for the flow of people and ideas. (General Education Code(s): CC.) M. Peterson

**155. History of Modern Israel. S**

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. (General Education Code(s): CC, E.) B. Thompson

**156. Interrogating Politics in the Post-Colonial Middle East. \***

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. (General Education Code(s): CC.) J. Derr

**157. The Ottoman Empire. \***

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. (General Education Code(s): CC.) J. Derr

**158C. Slavery in the Atlantic World: Historical and Archaeological Perspectives. \***

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. (Also offered as Anthropology 179. Students cannot receive credit for both courses.) (General Education Code(s): PR-E.) G. O'Malley

**159A. Greco-Roman Egypt. \***

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). (General Education Code(s): CC.) E. Sullivan

**159B. Women and Gender in Ancient Egypt. \***

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. (General Education Code(s): CC.) The Staff

**159C. Temple and City: The Egyptian New Kingdom and the City of Thebes. \***

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. E. Sullivan

**160A. Athenian Democracy. W**

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. (General Education Code(s): CC.) C. Hedrick

## History

### **160C. Topics in Greek History. \***

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. May be repeated for credit. (General Education Code(s): CC.) C. Hedrick

### **161B. Topics in Roman History. \***

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. May be repeated for credit. C. Hedrick

### **161C. Age of Augustus. \***

Surveys Rome's transition from Republic to Empire, and the politics, people, and literary and material culture of the principate. J. Lynn

### **163B. Genesis: A History. F**

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. Course 44, Literature 80A, or some basis in Hebrew or Greek is strongly suggested. (General Education Code(s): CC.) N. Deutsch

### **164A. Late-Medieval Italy, c. 1200-1400. \***

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. C. Polecritti

### **164B. Renaissance Italy, c. 1400-1600. \***

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. Course 164A recommended as preparation. C. Polecritti

### **166. Northern Ireland: Communities in Conflict. \***

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. (Formerly Community Studies 136.) (General Education Code(s): CC.) D. Brundage

### **167A. The First World War. \***

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. The Staff

### **167B. The Second World War in Europe. \***

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. (General Education Code(s): CC.) The Staff

### **169. Dutch and Belgian History, 1500 to Present. \***

The political, social, economic, and cultural history of the modern Netherlands and Belgium from 1500 to the present day. The Staff

### **170A. French History: Old Regime and Revolution. W**

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. The Staff

### **170B. French History: The 19th Century. \***

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. The Staff

### **171. Revolutions in France. \***

Examines the political/social upheaval in 1789, 1830, and 1848 in light of the sweeping changes brought to 19th-century France by those other great "revolutions" of the age, the democratic and the industrial. Students' written work focuses on the comparative analysis of revolution. Offered in alternate academic years. The Staff

### **172A. German History. \***

The development of German civilization, including philosophy and literature as well as politics and diplomacy in the nineteenth and twentieth centuries. The Staff

## History

### **172B. German Film, 1919–1945. S**

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. The Staff

### **172D. Hitler and the Third Reich. \***

Focuses on Hitler's political career and analyzes how he harnessed Germany and much of Europe to his vision of a "New Order" organized along a social-Darwinist notion of the "racial community." M. Cioc

### **173A. Medieval Russia. \***

Topics include Russia's relations with Scandinavia, Byzantium, and the Mongols; Orthodoxy; and the roles of women. Materials include chronicles, letters, law codes, household manuals, travelogues, epics, art, architecture, and maps. Also explores the continuing relevance of Russia's medieval past through operas and film. (Formerly course 175A.) (General Education Code(s): CC.) M. Peterson

### **173B. Imperial Russia, 1696-1917. \***

Russian history from Peter the Great through the collapse of the Russian Empire. Explores the relationship between state and subjects (both Russian and non-Russian), alongside the role that geography played in an expanding empire in an increasingly globalizing world. (General Education Code(s): CC.) M. Peterson

### **173C. History of the Soviet Union. \***

Covers Soviet history from the late imperial period through the Soviet collapse. Explores the nature of the Soviet state, relationships between state and society, the role of the Soviet Union in the Cold War, and

experiences of everyday life. (Formerly course 175B, Modern Russian History.) (General Education Code(s): CC.) M. Peterson

### **174. Spies: History and Culture of Espionage. F**

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. (Formerly course 80K.) (General Education Code(s): CC.) The Staff

### **175D. History of Soviet Film. \***

Does not stress questions of aesthetics or technical aspects of film making, but the changing ideology inherent in Soviet films. The goal of examining cinema is to enrich our understanding of Soviet history. Readings include works of famous directors and theorists—Eisenstein, Vertov, Pudovkin, and Kuleshov—in addition to secondary works by Denise Youngblood, Richard Taylor, Josephine Woll, and Anna Lawton. The Staff

### **176. Eastern Europe, 1848-2000. \***

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. (General Education Code(s): CC.) The Staff

### **177. Smoke, Smallpox, and the Sublime: Thinking about the Environment in the 19th Century. \***

Examines ways in which Europeans and others thought about the environment and nature in the 19th century and how their concerns

about issues such as climate change, pollution, and conservation were both similar to and different from environmentalist thinking today. (General Education Code(s): PE-E.) M. Peterson

### **178A. European Intellectual History: The Enlightenment. \***

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. (Formerly European Intellectual History.) N. Deutsch

### **178B. European Intellectual History: The 19th Century. \***

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. (Formerly European Intellectual History.) The Staff

### **178C. European Intellectual History, 1870-1970. \***

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. Offered in alternate academic years. (General Education Code(s): CC.) The Staff

## History

### **178E. Modern Jewish Intellectual History. \***

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. Offered in alternate academic years. (General Education Code(s): ER.) The Staff

### **181. Modern Britain and the British Empire. S**

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. (General Education Code(s): CC.) M. Matera

### **181A. Postcolonial Britain and France. \***

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. (Also offered as Anthropology 1100. Students cannot receive credit for both courses.) (General Education Code(s): CC, E.) The Staff

### **183A. Nineteenth-Century Italy. W**

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. C. Polecritti

### **183B. Fascism and Resistance in Italy. S**

Examines Italian politics, society, and culture (c. 1900-1950), emphasizing the Fascist regime; interdisciplinary focus emphasizing history, literature, and film. Course 183A recommended as preparation. (Formerly course 183.) C. Polecritti

### **185D. Jewish Social Movements. \***

Jewish social movements of the late 19th and 20th centuries, in Europe (Eastern and Western) and the U.S.: the confrontation between Hasidism and Haskahah, tensions between socialism and Zionism, between religiosity and secularism, the mutual influences among these tendencies. (Also offered as History of Consciousness 118. Students cannot receive credit for both courses.) Enrollment restricted to juniors and seniors. Enrollment limited to 20. (General Education Code(s): E.) B. Epstein

### **185H. Women, Gender, and Jewish Modernity (1800-Present). \***

Explores the impact of modernization upon women and the concepts of gender, both feminine and masculine, in Jewish societies across Europe, the Middle East, and India. N. Deutsch

### **185I. Latin American Jewish History in the Modern Period. \***

Explores Jewish immigration settlement and identity negotiation in Latin America from the mid-19th Century to the present. The Staff

### **185J. The Modern Jewish Experience. \***

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. The Staff

### **185K. Jewish Life in Eastern Mediterranean Port Cities. \***

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. The Staff

### **185L. Where Civilizations Met-- Jews, Judaism, and the Iberian Peninsula. W**

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. N. Deutsch

### **190. Advanced Research and Reading Seminars. \***

An opportunity for advanced students to focus on specific research problems resulting in a substantial research paper of 25 pages, or discussion of assigned readings resulting in a series of short papers totaling 25 pages. Courses must be taken in area of concentration in order to count towards the major. The Staff

### **190A. Slavery and Race in Latin America. F**

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(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and

## History

senior history majors. Enrollment limited to 20. (General Education Code(s): W, E.) M. Diaz

### **190B. Race and the Nation in Latin America. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W, E.) M. Diaz

### **190C. 9/11 in Historical Perspective. \***

Explores how scholars and other observers have tried to make sense of the events of and following September 11, 2001, through analysis and other invocations of historical precedent. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; two upper-division history courses. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) E. Porter

### **190D. Asian and Latino Immigration Since 1875. S**

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(s): satisfaction of the Entry Level Writing and Composition requirements and two upper-division history courses. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. G. Delgado

### **190E. Topics in Chicana/o History. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W, E.) The Staff

### **190F. Research Seminar in the Americas. W,S**

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(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) L. Haas, A. Lonetree

### **190G. History and Theory. \***

Each year students study one or more theorists or schools of philosophy and history. Themes vary by year and include: Walter Benjamin, Hayden White, Agnes Heller, the Frankfurt School, and the Subaltern School. Prerequisite(s): two upper-division history courses and satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) L. Haas

### **190H. History of Time. \***

Writing-intensive seminar on the experience, manipulation, and representation of time in history. Students pursue advanced research using primary and secondary sources. Prerequisite(s): two upper-division history courses and satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) M. O'Hara

### **190I. California and the Borderlands. \***

Complete original research in California and borderlands history in this senior research seminar. Focus on selected problems and themes. Assignments and discussions help students frame their research and edit their writing. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) L. Haas

## History

### **190J. Diaspora and Migration in World History. \***

Diaspora studies recently have included a range of movements and people in colonial, post-colonial, and national dilemmas. Diaspora studies share historical themes with migration studies, and include the study of forced exile and situations of genocide and femicide experienced by indigenous and national minorities. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. L. Haas

### **190K. Wired Planet: Readings on the Global History of Broadcasting and Telecommunications. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) M. Lasar

### **190L. Personal Politics in the New South. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements; two upper-division history courses or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W, E.) C. Jones

### **190M. History of Children and Culture of Childhood in the 19th Century. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements and two upper-division history courses. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) C. Jones

### **190N. Topics in African History. S**

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(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W, E.) D. Anthony

### **190O. African American Historiography. \***

Major themes in contemporary African American historiography on a topical basis. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W, E.) D. Anthony

### **190P. Early American Society and Culture. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) M. Westerkamp

### **190Q. The Novel and History. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements, and two upper-division history courses or

## History

permission of instructor.

Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) M. Westerkamp

### **190R. Research in the History of American Religions. \***

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(s): Satisfaction of the Entry Level Writing and Composition requirements and two upper division history courses. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W, E.) M. Westerkamp

### **190S. Women and Social Movements in the U.S. \***

Examines history of women and social movements in the U.S., such as abolitionism, anti-lynching, Chinese and Jewish garment workers, Chicana farm labor activism, the American Indian Movement, the Ku Klux Klan, and the Civil Rights movement. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) D. Frank

### **190T. Latin America in the Cold War. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements, and two upper-division history courses.

Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) M. O'Hara

### **190U. Power, Culture, and the Federal Bureau of Investigation. W**

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. (Formerly Power and Culture in the U.S.)

Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor.

Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) M. Lasar

### **190W. Topics in U.S. Civil War and Reconstruction. \***

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. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and two upper-division history courses or permission of instructor.

Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) C. Jones

### **190X. History of the Atlantic World, 1492-1824. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements, and two upper-division history courses.

Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) G. O'Malley

### **190Y. The Atlantic Slave Trade. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements and two upper-division history courses.

Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) G. O'Malley

### **190Z. The Long Civil Rights Movement. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements and two upper-division history courses or permission of instructor.

Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) D. Brundage

## History

### **192. Directed Student Teaching.**

Teaching of a lower-division seminar under faculty supervision. (See course 42.) Students submit petition to sponsoring agency. The Staff

### **193. Field Study.**

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. May be repeated for credit. The Staff

### **194. Advanced Research and Reading Seminars. \***

An opportunity for advanced students to focus on specific research problems resulting in a substantial research paper of 25 pages, or discussion of assigned readings resulting in a series of short papers totaling 25 pages. Courses must be taken in area of concentration in order to count towards the major. The Staff

#### **194A. Gender, Class, and Sex in Shanghai. \***

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. (Also offered as Feminist Studies 194N. Students cannot receive credit for both courses.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; and

course 140C, or 140D, or 140E, or permission of instructor. Restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) E. Honig

#### **194B. Okinawan History. \***

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. (Formerly course 196X.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements two upper-division history courses, or permission of instructor. Enrollment limited to 20. (General Education Code(s): W.) A. Christy

#### **194E. Women in Japanese History. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) N. Aso

#### **194F. Jewish Shanghai. \***

Explores the migration of the more than 10,000 Jewish refugees who fled Europe during World War II and settled in Shanghai. Examines the different Jewish populations that fled to Shanghai, the "Shanghai ghetto," and the recovery of this piece of history from the 1980s through the present. Prerequisite(s): Satisfaction of the

Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. E. Honig

#### **194G. China Since the Cultural Revolution: Histories of the Present. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W, E.) G. Hershatter

#### **194H. Gender, Family, and State in China: 1600-Present. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W, E.) G. Hershatter

**194J. The Poor and the Everyday in Modern China. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors and minors and East Asian studies minors. Enrollment limited to 20. E. Honig

**194M. Literati, Samurai, and Yangban: Comparative History of State and Elite in East Asia, 1600-1900. \***

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 course 294M. Prerequisite(s): course 40A or 140B, and one additional upper-division history course or permission of instructor, and satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) M. Hu

**194N. Comparative Studies in Modern Asian History. \***

Seminar on cultural and social changes in Asia, mainly in the 19th and 20th centuries. Topics include colonial encounters, cities, narratives of ordinary persons, nationalism and identity, visual cultures, and Orientalism.

Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W, E.) The Staff

**194O. South Asia in the Twentieth Century. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. J. Shaikh

**194P. Urban South Asia. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) J. Shaikh

**194Q. Making Space in the Colonial and Post-Colonial World. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements; two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) J. Derr

**194R. Cairo: The City Victorious, 1750-2000. \***

The modernization of a world city from 1750 to the present. Cairo's social and cultural history (literature, film, music) against the background of its changing political and economic contexts. Topics include: orientalism, nationalism, imperialism, minorities, women, migration, urbanism, popular culture, tourism. Prerequisite(s): Two upper-division history courses; and course 41 or 101A or 101B; and satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) The Staff

**194U. The Cold War and East Asia. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements; two

## History

upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W, E.) N. Aso

### **194W. Social Movements in the Modern Middle East. S**

This writing-intensive seminar explores the social movements sweeping the contemporary Middle East. Students pursue advanced research using primary and secondary sources. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. J. Derr

### **194Y. Memories of WWII in the U.S. and Japan. \***

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(s): two upper-division history courses or permission of instructor; satisfaction of the Entry Level Writing and Composition requirements; course 80Y recommended. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W, E.) A. Yang

### **195A. Thesis Research.**

Prerequisite(s): petition on file with sponsoring agency (students should have completed two upper-division courses, preferably in their area of concentration). The Staff

### **195B. Thesis Writing.**

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). (General Education Code(s): W.) The Staff

### **196. Advanced Research and Reading Seminars.**

An opportunity for advanced students to focus on specific research problems resulting in a substantial research paper of 25 pages, or discussion of assigned readings resulting in a series of short papers totaling 25 pages. Courses must be taken in area of concentration in order to count towards the major. The Staff

### **196A. Global 1930s. \***

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. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and two upper-division history courses. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. M. Matera

### **196C. Modern Italian Culture. \***

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(s): course 164A or 164B or 183A or 183B, or permission of instructor and one upper-division history

course; and satisfaction of the Entry Level Writing Requirement.

Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) C. Polecritti

### **196D. City of Rome. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements; two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history, classical studies, and Italian studies majors. Enrollment limited to 20. (General Education Code(s): W.) C. Polecritti

### **196E. Modern Irish History. F**

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(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) B. Thompson

### **196F. European Environmental History. \***

Examines interactions between human societies and the natural world in Europe. Topics include: impact of European imperialism; changing attitudes toward the natural world; the Industrial Revolution in ecological

## History

perspective; the beginnings of preservationist and conservationist movements; the evolution of 20th-century environmentalism; and the historical context of contemporary environmental problems.

Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor.

Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) The Staff

### **196G. Modern Germany and Europe. S**

A senior reading and research seminar that explores the major historiographic debates in German history during the 19th and 20th centuries. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history, German studies, and Jewish studies majors. Enrollment limited to 20. (General Education Code(s): W.) The Staff

### **196H. Sex and the City--The History of Sexuality in Urban Areas Around the Globe. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements; two upper-division history courses, or by permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) M. Matera

### **196I. The French Revolution. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements; course 70B and one upper-division history course; or course 170A or 171.

Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) The Staff

### **196J. Autobiography and History. \***

Students prepare research papers using a combination of sources, both primary (the autobiographies, diaries, or memoirs of historically relevant figures) and secondary (chronologically and thematically appropriate works of synthesis that help contextualize the lives of their subjects). Seminar format with significant written requirements.

Prerequisite(s): satisfaction of the Entry Level Writing requirement; Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) The Staff

### **196K. Studies in European Intellectual History. \***

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(s): satisfaction of the Entry Level Writing and Composition

requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) The Staff

### **196M. Shtetl: Eastern European Jewish Life. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements, and two upper-division history courses. Enrollment restricted to junior and senior history and Jewish studies majors. Enrollment limited to 20. (General Education Code(s): W.) N. Deutsch

### **196N. Eastern European Jewish Social History. \***

Study of 19th- and 20th-century Eastern European and Russian Jewish social history.

Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor.

Enrollment restricted to junior and senior history, German studies, and Jewish studies majors. Enrollment limited to 20. (General Education Code(s): W, E.) The Staff

### **196O. Russian Revolution, 1917-1932. \***

Study of the major political, social, and intellectual conflicts and transformations of the period. Topics include February and October revolutions, Civil War, NEP,

## History

rise of Stalinism, and collectivization. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) The Staff

### **196P. Hitler and Stalin. W**

A discussion of 20th-century totalitarianism. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history, German studies, and Jewish studies majors. Enrollment limited to 20. (General Education Code(s): W.) P. Kenez

### **196Q. Europe and the World During the Cold War. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements; two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) M. Lasar

### **196R. Social World of Roman Palestine. \***

Inquiry into the structures of Roman Palestine on the basis of parables from the synoptic Gospels, the Dead Sea Scrolls, Josephus, inscriptions, and archaeological discoveries. Physical, social, economic, and ideological conditions are researched in an ethnographic fashion.

Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses. Enrollment restricted to junior and senior history, classical studies, and Jewish studies majors. Enrollment limited to 20. (General Education Code(s): W.) The Staff

### **196S. Special Topics in Ancient History. W**

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(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors and classical studies majors. Enrollment limited to 20. (General Education Code(s): W.) C. Hedrick

### **196T. Paris Peace Conference. F**

The Paris Peace Conference remade Europe and the globe after World War I. By establishing the League of Nations and signing the Versailles Treaty, the Paris diplomats shaped the postwar era and created the conditions for World War II. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Two upper-division history courses or permission of instructor required. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. M. Cioc

### **196U. Topics in Medieval History. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements, course 102A or 103, and one upper-division history course, or by permission. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. May be repeated for credit. (General Education Code(s): W.) The Staff

### **196V. The Soviet Experience. \***

Uses memoirs, diaries, novels, films, oral interviews and histories, and scholarly works to explore everyday life in the Soviet Union, and the extent to which the Soviet Union represented a totalitarian society. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment is restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) M. Peterson

### **196W. Brave New World? Scientific & Technological Visions of Utopia and Dystopia in Russia/Soviet Union. \***

Focuses on the role of scientific and technological developments in creating the kinds of social, economic, and ecological change that inspired utopian thinking--as well as utopia's counterpart, dystopia--in Russia in the late 19th and 20th centuries. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, two upper-division history courses, or permission of instructor. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) M. Peterson

**196X. National Socialism and the Third Reich. \***

A senior reading and research seminar that explores the major historiographic debates in German history during the Nazi period. Students conduct original research on the Third Reich using primary and secondary sources. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and two upper-division history courses, or by instructor permission. Enrollment restricted to junior and senior history, Jewish studies, and German studies majors. Enrollment limited to 20. The Staff

**196Y. Saints and Holiness in Medieval Europe. W**

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(s): two upper-division history courses; satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) C. Polecristi

**196Z. Europe From the Margins: Outside Influences on Modern European Thought and Culture. \***

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(s):

satisfaction of the Entry Level Writing and Composition requirements; two upper-division history courses. Enrollment restricted to junior and senior history majors. Enrollment limited to 20. (General Education Code(s): W.) M. Matera

**198. Independent Field Study.**

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. May be repeated for credit. The Staff

**199. Tutorial.**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199F. Tutorial (2 credits).**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**GRADUATE COURSES**

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**200. Methods and Theories of History. F**

An overview of theories, methods, and philosophies concerning the nature and production of history. Topics vary with instructor. Enrollment restricted to graduate history students and others by permission of instructor. Enrollment limited to 20. N. Deutsch

**201. Directed Research Colloquium. W**

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(s): history graduate research seminar. Enrollment restricted to graduate

history students. Enrollment limited to 15. D. Brundage

**202. Practicing World History. W**

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? Enrollment restricted to graduate students. Enrollment limited to 15. G. O'Malley

**203. Global Decolonization. \***

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. Enrollment is restricted to graduate students. Enrollment limited to 15. M. Matera

**204A. History of Gender Research Seminar. W**

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. Enrollment restricted to graduate students. Enrollment limited to 15. M. Westerkamp

**204B. Approaches to Social and Cultural History. \***

Graduate reading course focusing on both classic and contemporary approaches to social and cultural history. Readings induce: Bakhtin,

## History

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. (Formerly Society and Culture Research Seminar.) Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

### **204C. Colonialism, Nationalism and Race Research Seminar. S**

Research seminar introducing theories and methods of the comparative histories of race, ethnicity, colonialism, and nationalism. Enrollment restricted to graduate students. Enrollment limited to 15. E. Porter

### **204E. Transnationalism, Borderlands, and History. \***

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(s): Enrollment restricted to graduate students. Enrollment limited to 15. G. Delgado

### **205. Diaspora and World History. \***

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. Enrollment restricted to graduate students. Enrollment limited to 10. L. Haas

**206. Empire in World History. \*** 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. Enrollment restricted to graduate students, Enrollment limited to 15. M. Matera

### **210A. Readings in U.S. History. S**

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. Enrollment restricted to graduate students. Enrollment limited to 15. M. Westerkamp

### **210B. Readings in U.S. History. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. D. Frank

### **211A. Research Seminar in Early American History. \***

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. Course A is not a prerequisite to course B. Enrollment restricted to graduate students. Enrollment limited to 20. G. O'Malley, M. Westerkamp

### **211B. Research Seminar in Early American History. \***

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. Course A is not a prerequisite to course B. Enrollment restricted to graduate students. Enrollment limited to 20. G. O'Malley, M. Westerkamp

### **212A. Citizenship in U.S. History. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. C. Jones

### **212B. Citizenship in United States History. \***

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. Enrollment restricted to history graduate students. Enrollment limited to 15. C. Jones

### **214. California History. \***

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. Enrollment

## History

is restricted to graduate students. Enrollment limited to 15. L. Haas

### **215A. Topics in American History: U.S. Labor and Working Class History. \***

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. Enrollment limited to graduate students. Enrollment limited to 15. D. Frank

### **215B. Visions of Progress. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

### **215C. U.S. Immigration and Ethnic History. \***

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. Enrollment restricted to graduate students. Enrollment limited to 10. D. Brundage

### **216. Readings in the History of American Religions. \***

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. Enrollment restricted to graduate students.

Enrollment limited to 15. M. Westerkamp

### **217. Critical Conversations in Native American History. F**

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. (Formerly American Studies 224.) Enrollment restricted to graduate students. Enrollment limited to 10. A. Lonetree

### **220. The Atlantic World, 1500-1800. \***

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. (Formerly Topics in American History: The Atlantic World 1500-1800.) Enrollment restricted to graduate students. Enrollment limited to 15. M. Westerkamp

### **221. Empires and New Nations in the Americas. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. L. Haas

### **225. Spanish Colonialism. \***

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. Enrollment restricted to graduate students. Enrollment limited to 10. M. Diaz

### **227. Gender and Colonialism. \***

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. Enrollment restricted to graduate students. E. Honig

### **230A. Readings in Late Imperial China. \***

Survey of the major works on and historiographical controversies about Qing Dynasty (1644-1911) China. Enrollment restricted to graduate students. Enrollment limited to 20. M. Hu

### **230B. Engendering China. F**

Reading seminar on the history of Chinese gender, focusing on the Qing dynasty (1644-1911) to the present. Topics include marriage and family, sexuality, work, the gendered language of politics, and major reform movements. Enrollment restricted to graduate students. Enrollment limited to 20. E. Honig

**230C. Readings in 20th-Century China. W**

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. Enrollment restricted to graduate students. Enrollment limited to 20. G. Hershatter

**231. Historicizing the People's Republic of China. \***

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. Enrollment is restricted to graduate students. Enrollment limited to 15. E. Honig

**238A. Research Methods: China. \***

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. (Formerly course 228A.) Enrollment restricted to graduate students. Enrollment limited to 20. G. Hershatter

**238B. Research Methods: China. \***

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. (Formerly course 228B.) Enrollment restricted to graduate students. Enrollment limited to 20. G. Hershatter

**242. Readings in Modern Japan. \***

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. (Formerly course 210.) Enrollment restricted to graduate students. Enrollment limited to 15. N. Aso

**243. Transnational Japan. \***

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. Enrollment restricted to graduate students. Enrollment limited to 10. A. Christy

**244. Gender and Japanese History. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. A. Christy

**250A. Readings in European Social and Cultural History. \***

A readings seminar that introduces beginning graduate students to some of the major conceptual and methodological approaches to early modern European social and cultural history, 1400–1789. (Formerly course 205A.) Enrollment restricted to graduate students. Enrollment limited to 20. The Staff

**250B. Readings in European Social and Cultural History. \***

A readings seminar that introduces beginning graduate students to some of the major problems in modern European social and cultural history, 1789 to the present. (Formerly course 205B.) Enrollment restricted to graduate students. Enrollment limited to 20. The Staff

**251A. Readings in Modern European History: Environment and Technology. \***

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. Enrollment is restricted to graduate students. Enrollment limited to 15. M. Peterson

**255. Religion and Modernity. \***

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. Enrollment is restricted to graduate students. Enrollment limited to 15. N. Deutsch

**256. Nationalism, Anti-Semitism, and Jewish Resistance in World War II. \***

Jewish resistance to Nazism during World War II, in Eastern Europe, and its historical context. Includes the pre-war rise in nationalism and anti-Semitism in Poland and Lithuania, Jewish integration in the Soviet Union, and the consequences for wartime resistance. (Also offered as History of Consciousness 243A. Students cannot receive

## History

credit for both courses.) Enrollment restricted to seniors and graduate students. Enrollment limited to 15. B. Epstein

### **257. Shtetl: Eastern European Jewish Life. \***

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 196M. Enrollment restricted to graduate students. Enrollment limited to 20. N. Deutsch

### **260. History and the Spatial Turn: Making Space, Place, and Geography in History. \***

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. Enrollment restricted to graduate students. Enrollment limited to 20. J. Derr

### **265. History of the Body. \***

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. Enrollment is restricted to graduate students. Enrollment limited to 15. M. Westerkamp

### **280A. History Graduate Proseminar: Teaching Pedagogy (2 credits). F**

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. This course is required for first-year students; however, it is open to all other graduate students as needed. Enrollment restricted to graduate students. May be repeated for credit. M. Peterson

### **280B. History Graduate Proseminar: Research Presentations and Grant Writing (2 credits). F**

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. This course is required for first-year students; however, it is open to all other graduate students as needed. Enrollment restricted to graduate students. May be repeated for credit. M. Peterson

### **280C. History Graduate Proseminar: Job Market (2 credits). \***

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. This course is required for first-year students; however, it is open to all other graduate students as needed. Enrollment restricted to graduate students. May be repeated for credit. N. Aso

### **283. Foreign Language Preparation (2 credits). F,W,S**

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. May be repeated for credit. The Staff

### **284. Qualifying Examination Preparation (2 credits). F,W,S**

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. May be repeated for credit. The Staff

### **285. Readings in Research Field (2 credits). F,W,S**

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. Enrollment restricted to graduate students. May be repeated for credit. The Staff

## History

### **286. Research Colloquium on Colonialism, Nationalism, and Race (2 credits). F,W,S**

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. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **287. Research Colloquium on Gender (2 credits). F,W,S**

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. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **288. Teaching Assistant Preparation (2 credits). F,W,S**

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. May be repeated for credit. The Staff

### **289. History Colloquium (2 credits). F,W,S**

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. May be repeated for credit. The Staff

### **294M. Literati, Samurai, and Yangban: A Comparative History of State. \***

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 course 194M. Enrollment restricted to graduate students. Enrollment limited to 20. M. Hu

### **297. Independent Study.**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **299. Thesis Research.**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# HISTORY OF ART AND VISUAL CULTURE

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2015-16 General Catalog

D-201 Porter College

(831) 459-4564

[havc@ucsc.edu](mailto:havc@ucsc.edu)

<http://havc.ucsc.edu>

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## PROGRAM DESCRIPTION

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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, landscaping, the built environment, installation art, textiles, manuscripts, books, photography and film.

HAVC students at UC Santa Cruz (UCSC) 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. Students also have the opportunity to take independent study courses and write senior theses.

The 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 or minor in HAVC devises an individual study plan with a faculty adviser. The lower-division courses, numbered 1–99, 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 courses numbered 100–189 cover a broad range of issues in various aspects of world culture from earliest times to the present. Advanced upper-division courses focus on selected fields, topics,

and methods. The most advanced courses, numbered 190 and 191, are taught in seminar format.

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### PROGRAM LEARNING OUTCOMES

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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.

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### DECLARATION OF THE MAJOR

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To declare the major, students must complete two of the required four lower-division HAVC courses chosen from two different geographical regions:

10s Africa and its Diaspora;

20s Asia and its Diaspora;

## History of Art and Visual Culture

30s-40s Europe and the Americas;

50s Mediterranean;

60s Native Americas;

70s Oceania and its Diaspora

Students considering this major are encouraged to complete these courses early in their studies and consult with the HAVC undergraduate adviser to develop a plan of study. Transfer students should consult the Transfer Student/Transfer Credit section.

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### REQUIREMENTS OF THE MAJOR

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The HAVC major requires four lower-division and nine upper-division courses including the satisfactory completion of the senior comprehensive requirement. Students must take courses in each of the different cultural settings to ensure methodological and disciplinary breadth.

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#### LOWER-DIVISION REQUIREMENTS

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Four courses from four different geographical regions listed above.

HAVC 80 may be used to fulfill the lower-division regional breadth requirement for regions 10 (Africa), 60 (Native Americas), or 70 (Oceania).

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#### UPPER-DIVISION REQUIREMENTS

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Nine courses, as follows:

- 100A recommended during sophomore year. Because 100A is a prerequisite for other courses, if it is not completed by the end of the junior year, students may have difficulty enrolling in required courses and graduation may be delayed.
- 101-191: eight courses required, including a seminar (190s and 191s) to satisfy the senior comprehensive (see [Comprehensive Requirement](#) below).

In completing upper-division coursework, students must complete three upper-division courses (courses 101-191) from three different regions. Two of those regions must be a geographical area not studied at the lower-division level.

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#### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. Students in HAVC meet the DC requirement by completing course 100A.

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#### SENIOR COMPREHENSIVE REQUIREMENT

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All seniors must complete one seminar, 190-191, 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.

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### CONCENTRATION IN RELIGION AND VISUAL CULTURE

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This program is for students who wish to pursue the study of religion in conjunction with studies of visual culture. A student enters the concentration by proposing, in consultation with their faculty adviser, a sequence of upper-division courses to fulfill the religion and visual culture requirements. The declaration of major requirements for the religion and visual culture concentration are the same as those listed in the Declaration of Major section. The faculty adviser for the religion and visual culture concentration is Raoul Birnbaum.

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#### REQUIREMENTS FOR THE RELIGION AND VISUAL CULTURE CONCENTRATION

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Fifteen courses, as follows:

- Four lower-division courses (each from a different geographical area)
- 100A recommended during sophomore year. Because 100A is a prerequisite for other courses, if it is not completed by the end of the junior year, students may have difficulty enrolling in required courses and graduation may be delayed.
- 101-191: five courses that focus on the study of religion
- 190-191: one seminar (190s and 191s) to satisfy the senior comprehensive (see [Comprehensive Requirement](#) above).
- Four relevant upper-division courses in the study of religion from programs on campus such as anthropology, history, literature, and philosophy. (For a complete list of approved courses, please see the departmental web site <http://havc.ucsc.edu/program/religion>.)

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### MINOR REQUIREMENTS

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Nine courses, as follows:

- lower-division: three courses from three different geographical regions;
- upper-division: six courses planned in consultation with a faculty adviser.

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## DEPARTMENT ADVISING

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### UNDERGRADUATE ADVISER

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The undergraduate adviser offers specific information about navigating through the program and the curriculum and assists students with requirements, prerequisites, policies and procedures, learning support, scholarships, and special opportunities for undergraduate research.

### FACULTY ADVISERS

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Faculty are the best resource for learning about the philosophies and foundations of history of art and visual culture. Faculty advisers 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 adviser is assigned to each student by the undergraduate adviser during the declaration of major meeting.

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## LANGUAGES

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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 adviser to discuss an appropriate course of language study.

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## TRANSFER PREPARATION AND TRANSFER CREDIT

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Transfer students are encouraged to fulfill history of art and visual culture requirements prior to transfer. Refer to the ASSIST articulation agreements at [www.assist.org](http://www.assist.org) for approved lower-division courses offered at community colleges. Transfer credit for lower- or upper-division courses from four-year institutions or community colleges not included in the ASSIST system is evaluated on a case-by-case basis; students must submit a Course Transfer/Substitution Petition and course syllabus to the HAVC Department for review. A student may transfer **up to five** art history courses toward the major, only two of which may be upper-division. For the minor, a student may transfer **up to three** lower-division courses. HAVC majors must take a minimum of eight regularly scheduled HAVC courses from members of the HAVC faculty and HAVC minors must take a minimum of six regularly scheduled HAVC courses from members of the HAVC faculty. Transfer students are strongly encouraged to contact the HAVC Department for advisement before enrolling at UCSC.

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## EDUCATION ABROAD PROGRAM (EAP) COURSES

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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 Course Substitution Petition to seek the approval of your adviser and department chair to substitute EAP courses for HAVC major and minor requirements (EAP courses do not automatically satisfy major and minor 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 adviser to plan your EAP courses in advance.

For additional information, see:

<http://ieo.ucsc.edu/programs-abroad/academic-planning/major-minor-credit.html> and <http://ieo.ucsc.edu/programs-abroad/academic-planning/uc-vs-transfer-credit.html>.

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## CAREERS

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The preparation students receive from the baccalaureate of arts degree in HAVC provides skills that can lead to successful careers in education, law, business, and social services, in addition to more disciplinary-specific careers in museum curating, art restoration, studies in architecture, and studies in art history leading to a graduate degree.

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## GRADUATE STUDY

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There are many graduate programs that lead to the master of arts (M.A.) and doctor of philosophy (Ph.D.) degrees in fields such as art history, visual studies, cultural studies, history of religions, theory and criticism of art, etc. Most graduate programs require a reading knowledge of one or two languages other than English (see [Languages](#) above). Students who contemplate graduate study should consult with their faculty advisers as early as possible in their undergraduate careers.

## GRADUATE PROGRAM

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The History of Art and Visual Culture Department offers a course of study leading to the Ph.D. in visual studies. The Ph.D. is designed to steep our graduates in the most theoretically relevant methodologies for understanding the significance of visual artifacts and the social and cultural qualities of human vision (termed *visuality*); provide students with exposure to a range of cultural perspectives and visual artifacts drawn from around the world; and cultivate in our graduates the necessary skills and knowledge to secure and excel in academic and curatorial positions. The program is both interdisciplinary and flexible. Students work closely with their advisers and the director of graduate studies to craft personalized courses of study that advance their intellectual and professional goals.

The program employs a wide range of visual evidence for examination, without being constrained by traditional hierarchies of art. Fine arts, architecture, photography, film, performances, rituals, utilitarian objects, and popular entertainments all are primary material in the investigation of visual culture. Our program at UCSC is particularly adept at illustrating significant differences in how disparate cultural groups interpret their visual worlds, given the breadth of cultural perspectives taught by our faculty. With scholars focusing on cultures in Africa, the Americas, Asia, Europe, the Mediterranean, and the Pacific Islands, visual studies at UCSC offers students an unparalleled opportunity to consider the role of social and cultural forces in guiding how and what their members see.

## GRADUATE PROGRAM REQUIREMENTS

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Students take a minimum of twelve, 5-credit graduate courses during their first two years of study, comprised of four core courses and eight electives.

The four core courses must be taken within the first two years: HAVC 201A and 201B, Introduction to Visual Studies and Critical Studies (fall and winter of the first year); HAVC 202, Introduction to Visual Studies Methods (spring of the first year); and HAVC 204, Grant Writing (second year).

Of the eight elective courses, at least four 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 four visual studies electives, at least two must be from the HAVC courses numbered 212-280 and taught by core faculty, and at least one of the two must be a seminar course on a subject outside the student's disciplinary focus. Only two of the four visual studies electives may be independent study courses. Please

review [the visual studies web site](#) for a list of current electives.

## Field Clusters/Field Specialties

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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 theories of *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, each student will develop a cluster of individualized field courses in consultation with their adviser based on her/his 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 around 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 adviser based on the student's intellectual and professional goals. To count toward the degree, field clusters must receive prior approval from the visual studies graduate committee.

## Language Requirement

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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 adviser 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.

### 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 graduate program committee. 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.

Prior to the end of his/her second year, a student should consult with his/her adviser 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, each student will respond in writing to three general questions, posed by three of their examiners in the pre-arranged topic areas. In part two, each student will gather together with his/her examiners to field questions probing and clarifying the previously submitted written component of the qualifying examination. In order to pass the qualifying examinations, the student must receive the unanimous endorsement of the committee members.

### 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 director, 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 director, 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 QE 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.

### Advancing 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.

### Dissertation and Final Examination

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

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 adviser and the visual studies graduate program committee. The student's dissertation committee, under the supervision of the director of graduate studies, will conduct the examination. In the event that the director of graduate studies serves on the dissertation committee, the chair of History of Art and Visual Culture will oversee the defense. Interested faculty and students in the visual studies program will have the opportunity to observe the defense.

### 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.

### Designated Emphasis

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

- 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.
- 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.
- 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.

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## HISTORY OF ART AND VISUAL CULTURE FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**Harry Berger Jr., Emeritus**

**Martin A. Berger**

Gender, race, and representation in U.S. culture

**Raoul Birnbaum**

Buddhist studies, especially Chinese practices from medieval times to the present; religion and visual culture in China

**Elisabeth Cameron**

Visual cultures of Central Africa, issues of gender, post-colonialism, iconoclasm

**Carolyn Dean**

Cultural histories of the native Americas and colonial Latin America

**T.J. Demos**

Contemporary art and visual culture, investigating in particular the diverse ways that artists and activists have negotiated crises associated with globalization, including the emerging conjunction of post-9/11 political sovereignty and statelessness, the hauntings of the colonial past, and the growing biopolitical conflicts around ecology and climate change

**Jennifer A. González**

Contemporary theories of visual culture, semiotics, critical museum studies, photography, public and activist art in the U.S.

**John Hay, Emeritus**

**Virginia Jansen, Emerita**

**Jasper A. Rose, Emeritus**

**Catherine M. Soussloff, Emerita**

### ASSOCIATE PROFESSOR

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**Maria Evangelatou**

Medieval visual culture with emphasis on Byzantium and its periphery; manuscript illumination, Marian cult and iconography; ancient Greek and Roman visual culture; Islamic visual culture; gender studies

**Donna M. Hunter, Emerita**

**Stacy L. Kamehiro, Patricia and Rowland Rebele Chair in History of Art and Visual Culture**

Visual cultures of Oceania; colonial cultures; visual culture and identity; gender studies; museums and collecting; material culture

**Boreth Ly**

Visual cultures of Southeast Asia and its diaspora: religions and materiality, theory of visual narrative, the politics of cultural translation; (post) colonial and cultural studies; issues of gender, sexuality, race, and trauma

### ASSISTANT PROFESSOR

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**Derek Conrad Murray**

Theory and criticism of contemporary art, cultural theory, identity and representation, art of the African diaspora, popular visual culture, contemporary photography, and the ethics of art history and visual studies

**Albert Narath**

Modern and Contemporary architecture and design; environmental history, theories of technology, historiography of modernism, anthropology and architecture



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PROFESSOR

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**Karen Bassi (Literature)**

Greek and Latin literatures; gender; literary and cultural theory; pre- and early modern studies; tragedy; historiography; visual and performance studies; death studies

**James Clifford (History of Consciousness, Distinguished Professor Emeritus)**

Anthropology, indigeneity, museum studies, exoticism

**Shelly Errington (Anthropology)**

Globalization of folk art, visual and social semiotics, photography, film, the Internet and digital media, Southeast Asia, and Latin America

**Kathy Foley (Theater Arts)**

Southeast Asian drama and dance; puppetry

**Dianne Gifford-Gonzalez (Anthropology)**

Zooarchaeology, African archaeology, pastoralism, colonial New Mexico, interpretive theory, visual anthropology, emergence of pastoralism in East Africa; foodways as cultural practices in colonial encounters

**David Marriott (History of Consciousness)**

Literary theory, psychoanalysis, black cultural theory and philosophies of race, literary and visual cultures of modernism

**Warren Sack (Film and Digital Media)**

Theory and practice of digital media, software design and media theory

**Shelly Stamp (Film and Digital Media)**

Silent cinema, female filmmakers, film censorship, histories of moviegoing, early Hollywood

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ASSOCIATE PROFESSOR

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**Noriko Aso (History)**

Japanese history, cultural studies, gender and history, race and ethnicity, colonialism, nationalism, Korean history, and popular culture

**A. Hunter Bivens (Literature)**

Twentieth- and 21st-century German literature and film; Marxism and critical theory; psychoanalysis; lyric poetry; literary realism; the novel

**Irene Gustafson (Film and Digital Media)**

Producing across the boundaries between "theory" and "practice," non-fiction, gender and queers, production design

**Peter Limbrick (Film and Digital Media)**

Postcolonial and transnational cinemas, race, gender, sexuality, queer theory

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ASSISTANT PROFESSOR

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**Christine Hong (Literature)**

Asian American literature and cultural criticism; African American literature and black freedom studies; Korean diasporic cultural production; Pacific Rim studies; postcolonial theory; critical race theory; human rights discourse; law and literature; narrative theory; film and visual studies

**Soraya Murray (Film and Digital Media)**

New media art, theory, and criticism; visual culture including digital, film, video, and electronic games; theories of technology and globalization; media representations of technological and scientific advancement; representations of otherness, migration, citizenship

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HISTORY OF ART AND VISUAL CULTURE COURSES

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LOWER-DIVISION COURSES

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**7. Climate Justice Now! Arts, Activism, and Environment Today. S**

Interdisciplinary examination of various topics and issues in the arts featuring invited guest speakers. Part of the spring quarter Arts Division Dean's Lecture Series. (Formerly Issues in the Arts.) May be repeated for credit. (General Education Code(s): IM.) E. Cameron

**10. Introduction to African Visual Culture. \***

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. (General Education Code(s): CC.) E. Cameron

**20. Visual Cultures of Asia. F**

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. (Formerly course 10D, Presence and Power in the Visual Cultures of Asia.) (General Education Code(s): CC, IH, A.) B. Ly

**22. Religion and Visual Culture in China. \***

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

## History of Art and Visual Culture

world, and logics of the built environment. (Formerly course 80G.) (General Education Code(s): CC, A, E.) R. Birnbaum

### **24. Southeast Asia Visual Culture.** \*

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. (Formerly course 10C.) (General Education Code(s): CC, IH, A, E.) B. Ly

### **27. Image and Ideology in Indian Art. S**

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. (Formerly course 80N, Indian Art: Image and Ideology.) (General Education Code(s): IM, A, E.) K. Thangavelu

### **30. Introduction to European Visual Culture. \***

An introduction to the European tradition in visual culture, from antiquity to the present, but not in chronological order. All media, including the fine arts, architecture, film, video, and installation and performance work are incorporated. Presents the major visual regimes of representation while it probes the meanings and limits of Europe and the European tradition in the context of the visual. (Formerly course 10G, Europe.) (General Education Code(s): IM, IH, A.) A. Langdale

### **31. The Nude in the Western Tradition. \***

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 course 10F.) (General Education Code(s): IM, IH, A.) D. Hunter

### **40. Museum Cultures: The Politics of Display. W**

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. (Formerly course 80D.) (General Education Code(s): IM, A.) J. Gonzalez, The Staff

### **41. Modern Art in Context. \***

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. (Formerly course 80V.) (General Education Code(s): IM, A.) M. Berger

### **43. History of Modern Architecture. \***

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. (Formerly course 46.) (General Education Code(s): IM, IH, A.) A. Narath

### **44. Design and Environment in the American West. S**

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. (General Education Code(s): PE-E.) A. Narath

### **45. Photography Now. W**

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). (General Education Code(s): IM.) D. Murray, The Staff

### **46. Introduction to U.S. Art and Visual Culture. S**

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. (General Education Code(s): ER.) M. Berger, The Staff

### **47. Introduction to Global Architecture. F**

Introduces the study of architecture and the built environment from a global perspective, focusing on architecture's relation to themes,

## History of Art and Visual Culture

such as ritual, power, the city, technology, and climate. (General Education Code(s): CC, A, E.) A. Narath

### **50. Ancient Mediterranean Visual Cultures. F**

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. (Formerly course 80E.) (General Education Code(s): IM, A.) The Staff

### **51. Greek Eyes: Visual Culture and Power in the Ancient Greek World. W**

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. (Formerly course 80X, Greek Eyes: Visual Culture and Power in the Ancient Greek.) (General Education Code(s): IM, A.) M. Evangelatou

### **58. Gardens of Delight: Fifteen Centuries of Islamic Visual Culture. \***

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. (Formerly

course 180.) (General Education Code(s): CC, A, E.) M. Evangelatou

### **60. Indigenous American Visual Culture. \***

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. (Formerly course 80M.) (General Education Code(s): ER, A, E.) C. Dean

### **70. Visual Cultures of the Pacific Islands. F**

Interdisciplinary course examines visual cultures of Australia, Melanesia, Micronesia, and Polynesia from the archaeological past through contemporary periods. (Formerly course 105P.) (General Education Code(s): CC, A, E.) S. Kamehiro, The Staff

### **80. Colonial Histories and Legacies: Africa, Oceania, and the Indigenous Americas. S**

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. (General Education Code(s): ER, IH, E.) E. Cameron

### **99. Tutorial. F,W,S**

Supervised study for undergraduates. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## UPPER-DIVISION COURSES

### **100A. Approaches to Visual Studies. W**

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. Course 100A is a prerequisite for all History of Art and Visual Culture seminars. (Formerly Methods in History of Art and Visual Culture) Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements. Enrollment restricted to sophomore, junior, and senior History of Art and Visual Culture majors and minors. (General Education Code(s): W,A.) E. Cameron

### **Africa and Its Diaspora**

#### **110. Visual Cultures of West Africa. F**

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): course 10 or 80 recommended. (Formerly course 107B, West Africa.) (General Education Code(s): CC, A, E.) E. Cameron

#### **111. Visual Cultures of Central Africa. \***

Examination of visual cultures of Central Africa within a historical sequence from the Sanga archaeological excavations to contemporary easel painting. (Formerly course 107A, Central Africa) Prerequisite(s): course 80 suggested. Enrollment restricted to sophomores, juniors and seniors (recommended). (General Education Code(s): CC, A, E.) E. Cameron

#### **115. Gender in African Visual Culture. \***

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? (Formerly course 185B, Gender.) (General Education Code(s): A, E.) E. Cameron

**116. African Architecture. \***

Study of the built environment in Africa. Focusing in depth on 10 major architectural forms or sites, this course explores the diversity of architectural types and how gender, politics, religion, and culture shape and are shaped by architectural spaces. (General Education Code(s): PE-E.) E. Cameron

**117. Contemporary Art of Africa. \***

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. (Formerly course 185D.) Enrollment restricted to sophomores, juniors, and seniors. (General Education Code(s): IM, A, E.) The Staff

**118. Art of the Contemporary African Diaspora. W**

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; Creolité and creolization; hybridity; cosmopolitanism; post-black; and globalism in the arts. (Formerly course 189Y.) Recommended: background in art history. Enrollment restricted to sophomores, juniors, and seniors. (General Education Code(s): A.) D. Murray

**Asia and Its Diaspora**

**122. Visual Cultures of China.**

**122A. Sacred Geography of China. \***

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. (Formerly course 154A.) Enrollment restricted to sophomores, juniors, and seniors. (General Education Code(s): CC, A.) R. Birnbaum

**122B. Constructing Lives in China: Biographies and Portraits. S**

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. (Formerly course 155.) (General Education Code(s): CC, A, E.) R. Birnbaum

**122C. Writing in China. \***

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. (Formerly course 159D.) (General Education Code(s): A.) The Staff

**122D. Chinese Landscape Painting. F**

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. (Formerly course 159B.) (General Education Code(s): IM, A.) The Staff

**123. Visual Cultures of South Asia.**

**123A. Modernity and Nationalism in the Arts in India. S**

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 course 189D.) (General Education Code(s): A, E.) K. Thangavelu

**123B. Religions and Visual Culture of South Asia. W**

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. (Formerly course 106A.) Enrollment restricted to sophomores, juniors, and seniors. (General Education Code(s): CC, A, E.) B. Ly

**Visual Cultures of Southeast Asia**

**124A. Arts of Ancient Southeast Asia. \***

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. Enrollment restricted to sophomores, juniors, and seniors. (General Education Code(s): CC.) B. Ly

**124B. History of Photography in Southeast Asia. W**

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. Enrollment restricted to sophomores, juniors and seniors. (General Education Code(s): CC.) B. Ly

**124C. Arts and Politics in Theravada Traditions. F**

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. (Formerly course 163B.) Enrollment restricted to sophomores, juniors, and seniors. (General Education Code(s): CC, A.) B. Ly

**124D. Contemporary Art of Southeast Asia and its Diaspora. \***

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. Enrollment restricted to sophomores, juniors, and seniors. (General Education Code(s): CC.) B. Ly

**Topics in Cross-Regional Studies in Visual Cultures of Asia**

**127A. Buddhist Visual Worlds. W**

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. (Formerly course 114.) Enrollment restricted to sophomore, junior, and senior students. (General Education Code(s): CC, A.) R. Birnbaum

**127B. Buddhist Pure Lands. \***

Conceptions of "pure lands" have engaged the imaginations of Mahayana Buddhists for more than two millennia. Course considers literary and visual representations of pure lands and their inhabitants, as well as related practice traditions. Special emphasis on Chinese traditions. Previous courses in Asian visual cultures and/or Buddhist studies recommended. (Formerly course 154D.) (General Education Code(s): CC, A.) R. Birnbaum

**127C. Ritual in Asian Religious Art. \***

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. (Formerly course 105E.) (General Education Code(s): IM, A, E.) The Staff

**127D. Storytelling in Asian Art. \***

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. (Formerly course 160.) (General Education Code(s): A, E.) The Staff

**127E. Modern/Contemporary Architecture of the Asia Pacific. \***

Examines 20th- and 21st-century architecture in China, Japan, Korea, Australia, New Zealand, Papua New Guinea, Hawaii, Samoa, and the Philippines. Examines how aesthetic, socio-political, economic, and technological networks have contributed to Asia Pacific's dynamic and experimental approaches to contemporary architecture. (General Education Code(s): IM.) The Staff

**Europe and the Americas**

**133A. Themes in the Study of Medieval Visual Culture. \***

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. (Formerly course 129.) (General Education Code(s): IM, A.) The Staff

**135. History of Art and Visual Culture in Europe.**

**135B. German Art, 1905–1945. \***

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. (Formerly course 136.) (General Education Code(s): IM, A.) D. Hunter

**135D. French Painting, 1780–1855. \***

The art of David, Gros, Ingres, Gericault, Delacroix, the Barbizon

## History of Art and Visual Culture

School, and Courbet studied in relation to the changing status of the art and the political events from 1789 to 1848. (General Education Code(s): IM, A.) D. Hunter

### **135E. Jewish Identity and Visual Representation. \***

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. (Formerly course 172.) Enrollment restricted to juniors and seniors. (General Education Code(s): IM, A, E.) The Staff

### **135H. Topics in European and Euro-American Visual Culture. \***

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). May be repeated for credit. (General Education Code(s): IM.) D. Hunter

### **135P. Paris, "Capital of the 19th Century". \***

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. (General Education Code(s): IM.) The Staff

### **Renaissance**

### **137A. Northern Renaissance Art. \***

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. (Formerly course 105R.) (General Education Code(s): A.) The Staff

### **137B. Italian Renaissance: Art and Architecture. W**

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. (Formerly "Italian Renaissance: Representation and Institutions.") (General Education Code(s): IM, A.) A. Langdale

### **137C. High Renaissance. \***

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. (Formerly course 168.) (General Education Code(s): IM, A.) The Staff

### **137D. Art of the Venetian Renaissance. \***

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. (Formerly course 189V.) (General Education Code(s): IM, A.) A. Langdale

### **137E. Renaissance Prints. W**

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. (General Education Code(s): IM, A.) A. Langdale

### **History of Art and Visual Culture in the U.S.**

### **140A. America in Art. \***

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. (Formerly course 126.) (General Education Code(s): IM, A.) M. Berger

### **140B. Victorian America. \***

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. (Formerly course 178A.) (General Education Code(s): ER, A.) M. Berger, The Staff

### **140C. Race and American Visual Arts. \***

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. (General Education Code(s): ER, A, E.) M. Berger

**140D. Chicano/Chicana Art: 1970-Present. F**

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. (Formerly course 182.) (General Education Code(s): ER, A, E.) J. Gonzalez, The Staff

**140E. Art and Science in America: "Contact" to circa 1900. \***

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. (General Education Code(s): PE-T.) The Staff

**140P. Pop Culture as High Art. \*** 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. (Formerly Pop and Popular Culture.) (General Education Code(s): IM.) The Staff

**Modern Art and Visual Culture in Europe and the Americas**

**141A. Modern Art: Realism to Cubism. F**

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. (General Education Code(s): IM, A.) D. Hunter, The Staff

**141B. Modern Art: Cubism to Pop. W**

From Paris to New York, cubism to conceptual art, an introduction to visual arts and theories of representation produced in the U.S. and Western Europe between 1910 and the 1960s, with attention to the social and political role of the art market, criticism, and censorship. Students cannot receive credit for this course and Digital Arts New Media 241B. (General Education Code(s): IM, A.) J. Gonzalez, The Staff

**141C. Modern Art: Pop to Present. S**

Surveys major 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. (General Education Code(s): IM.) D. Murray, The Staff

**141E. Histories of Photography. \***

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. (Formerly course 149A.) (General Education Code(s): IM, A.) J. Gonzalez, The Staff

**141F. The Camera and the Body. \***

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. (Formerly course 180.) (General Education Code(s): IM, A.) J. Gonzalez

**141H. Media History and Theory. \***

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. (Formerly course 131.) (General Education Code(s): IM, A.) The Staff

**141I. Environments, Installations, and Sites. \***

A study of conceptual and formal issues that have informed the production of temporary, site-specific art works since 1960. Works that seek to transform the role of the audience, to escape or remake museum and gallery spaces, to introduce environmental concerns, or to situate art in "the land" or in "the street" serve as a focus. (Formerly course 181.) Enrollment limited to 35. (General Education Code(s): IM, A.) J. Gonzalez

**141J. Critical Issues in Contemporary Art and Visual Culture. F**

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. (General Education Code(s): IM.) D. Murray

**141K. Activist Art Since 1960: Art, Technology, Activism. F**

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. (Formerly course 141C.) (General Education Code(s): IM, A, E.) T. Demos

**142. Contemporary Art and Ecology. \***

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. (General Education Code(s): PE-E.) T. Demos

**Architecture**

**143A. Contemporary Architecture and Critical Debates. \***

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. (Formerly course 124.) (General Education Code(s): IM, A.) The Staff

**143B. History of Urban Design. \***

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. Enrollment restricted

to juniors and seniors. (General Education Code(s): IM.) The Staff

**143C. Latin American Modern Architecture. \***

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. (General Education Code(s): CC, A, E.) The Staff

**143D. Architecture and the City in Modern and Contemporary Visual Culture. \***

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. Enrollment restricted to juniors and seniors. (General Education Code(s): IM.) The Staff

**143E. History of Design: The Objects of Technology, 1850-The Present. \***

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. (General Education Code(s): PE-T.) A. Narath

**143F. Constructing Memory and Place in Postwar Architecture. \***

How have architects engaged memory and place in architectural projects and built landscapes since World War II? Examines memorializing, memory, and erasure of place in reconstruction of cities, creation of memorials, and

design of buildings. (Formerly course 174C.) Enrollment restricted to sophomores, juniors, and seniors. Enrollment limited to 35. (General Education Code(s): A.) The Staff

**143G. After Utopia: Architecture and the City, 1968-Present. W**

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. (General Education Code(s): PE-E.)

A. Narath

**The Mediterranean**

**151. Greek Myths Antiquity to the Present. S**

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. Course 51 recommended as preparation.. (Formerly course 106I, Myth in Greek and Roman Art.) (General Education Code(s): IM, A.) M. Evangelatou

**152. Roman Eyes: Visual Culture and Power in the Ancient Roman World. \***

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.

## History of Art and Visual Culture

(Formerly Images in the Roman World.) (General Education Code(s): IM, A.) The Staff

### **154. Byzantine Visual Culture: Politics and Religion in the Empire of Constantinople, 330-1453 A. C. \***

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. (Formerly course 104A, Byzantine Visual Culture: Politics and Religion in New Rome, 300-1453 A. D.) (General Education Code(s): IM, A.) M. Evangelatou, The Staff

### **155. Constructing Cleopatra: Power, Sexuality, and Femininity Across the Ages. \***

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. (General Education Code(s): IM.) M. Evangelatou

### **Native Americas**

#### **160. Topics in Pre-Hispanic Visual Culture.**

##### **160A. Pre-Hispanic Visual Culture: Mexico. S**

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. (General Education Code(s): CC, A.) C. Dean, The Staff

##### **160B. Pre-Hispanic Visual Culture: The Andes. \***

The art of selected pre-hispanic cultures of Colombia, Ecuador, Peru, and Bolivia including the Nazca, Moche, Chimu, and Inca. (Formerly Pre-Hispanic Andes.) (General Education Code(s): IM, A.) C. Dean

##### **Advanced Studies in Pre-Hispanic Visual Culture**

##### **162A. The Maya. \***

The art and architecture of the Maya of southern Mesoamerica from the first century C.E. to ca. 1500. Courses 80, 60, or 160A recommended as preparation. (Formerly course 150A) (General Education Code(s): CC, A.) C. Dean, The Staff

##### **162B. The Inka. F**

The visual culture of the Inka of the Andean region of western South America including textiles, metalwork, and the built environment. Courses 80 (formerly 10E) or 60 (formerly 80M) recommended as preparation. (General Education Code(s): CC.) C. Dean

##### **163. The Native in Colonial Spanish America. S**

Indigenous contributions to colonial Spanish American visual culture including architecture, manuscripts, sculpture, painting, textiles, featherwork, and metallurgy. Focus on colonial Mexico, the Andes, and California. (Formerly course 151A.) (General Education Code(s): ER.) C. Dean, The Staff

##### **Oceania and its Diaspora**

##### **170. Art of the Body in Oceania. S**

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. (General Education Code(s): ER, A, E.) S. Kamehiro

##### **172. Textile Traditions of Oceania. \***

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. (Formerly course 187A.) (General Education Code(s): CC, A, E.) S. Kamehiro

##### **179. Topics in Oceanic Visual Culture. F**

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. May be repeated for credit. (General Education Code(s): CC.) S. Kamehiro, The Staff

##### **Cross-Regional Studies**

##### **180A. Global Contemporary Art. \***

Examines selected and changing topics in the study of contemporary art in a globalized world but outside of Europe and Euro-America where contemporary arts forms move across discrete geographical areas along newly developing networks. The specific topic varies with each offering to keep up with recent

directions in scholarship. May be repeated for credit. (General Education Code(s): CC.) The Staff

### **185. Critical Issues and Professional Practices in Visual Studies. S**

Introduces the practices and production of art historical/visual cultural knowledge. Topics include: interdisciplinarity, pedagogy, museums, art criticism, digital humanities, cultural property, preservation, conservation, art/cultural organizations, art markets, archives, and the role of the humanities in contemporary life. Enrollment is restricted to history of art and visual cultural majors. S. Kamehiro

### **Seminars in the History of Art and Visual Culture**

#### **190A. African Art and Visual Culture. \***

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(s): course 10 or 80. May be repeated for credit. (General Education Code(s): A, E.) E. Cameron

#### **190B. Play and Ritual in Visual Cultures. \***

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. (Formerly course 191F.) (General Education Code(s): A, E.) E. Cameron

#### **190C. The Mediterranean from the Rise of Christianity to the Rise of Islam. \***

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. (Formerly course 153.) (General Education Code(s): IM, A.) M. Evangelatou

#### **190D. The World of the Lotus Sutra. S**

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(s): course 127A or by permission of instructor. (General Education Code(s): A.) R. Birnbaum

#### **190E. Huayan Visions. \***

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. (Formerly course 190I.) Prerequisite(s): course 127A or by permission of instructor. (General Education Code(s): A.) R. Birnbaum

#### **190F. Chan Texts and Images. \***

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. (Formerly course 191H.) Prerequisite(s): course 127A or by permission of instructor. (General Education Code(s): A.) R. Birnbaum

#### **190G. Buddhist Wisdom Traditions. \***

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. (Formerly course 191Z.) Prerequisite(s): course 127A or by permission of instructor. (General Education Code(s): A.) R. Birnbaum

#### **190J. Visual Cultures of the Vietnam-American War. \***

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. (Formerly course 191A.) (General Education Code(s): ER, A, E.) B. Ly

#### **190K. Thematic Approach to Visual Cultures of Southeast Asia. \***

Undergraduate seminar that takes topical and thematic approach to looking at ancient or modern and contemporary arts of Southeast Asia (e.g., textile, water in arts and architecture, comparative modernity, race, gender, and sexuality). The specific topic and theme varies from year to year. Enrollment limited to 18. B. Ly

#### **190M. Representations of Women in Indian Art. \***

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. (General Education Code(s): A, E.) K. Thangavelu

**190N. Topics in Mediterranean Visual Culture. W**

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. May be repeated for credit. (General Education Code(s): CC.) M. Evangelatou, The Staff

**190O. Berlin: History and the Built Environment. \***

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. (General Education Code(s): A.) The Staff

**190P. Death and Patriotism: The Case of the French Revolution. \***

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. (General Education Code(s): A.) D. Hunter

**190Q. Portraiture: Europe and America, 1400–1990. F**

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. (General Education Code(s): A.) D. Hunter, The Staff

**190S. New Directions in Contemporary Art. \***

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. (Formerly Critical Issues in Contemporary Art and Visual Culture.) D. Murray

**190T. Topics in Pre- and Post-Columbian Visual Culture. \***

Seminar on changing topics related to the current scholarship on pre-Hispanic and colonial Spanish American visual culture. May be repeated for credit. The Staff

**190U. Word and Image in Illuminated Byzantine Manuscripts. \***

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. (Formerly course 190R.) (General Education Code(s): A.) M. Evangelatou

**190V. Cult of Mary in Byzantium. \***

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. (Formerly course 191X.) (General Education Code(s): A.) M. Evangelatou

**190W. Art and Culture Contact in Oceania. \***

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. (General Education Code(s): A, E.) S. Kamehiro

**190X. Art and Identity in Oceania. \***

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. (General Education Code(s): ER, A, E.) S. Kamehiro, The Staff

**191. Seminars in the History of Art and Visual Culture.**

**191A. Iconoclasm. \***

What happens when, to control an object, it is destroyed? Examines destruction of art as a way of ending

## History of Art and Visual Culture

the object's life cycle, as a device of social tension/change, and as a colonial and post-colonial mechanism of religious/political control. (General Education Code(s): A, E.) E. Cameron

### **191B. The Virgin of Guadalupe: Images and Symbolism in Spain, Mexico, and the U.S. \***

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. (Formerly course 190B.) (General Education Code(s): A, E.) C. Dean, The Staff

### **191C. Subalternatives: Representing Others. \***

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. (Formerly course 190C.) (General Education Code(s): ER, A, E.) C. Dean

### **191D. Semiotics and Visual Culture. \***

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. (Formerly course 190S.) (General Education Code(s): A.) J. Gonzalez

### **191E. Feminist Theory and Art Production. \***

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. (Formerly course 190T.) Enrollment limited to 18. (General Education Code(s): A.) J. Gonzalez

### **191F. Image and Gender. \***

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. (Formerly course 190Y.) (General Education Code(s): A.) M. Berger, The Staff

### **191G. Art, Cinema, and the Postmodern. \***

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. D. Murray

### **191I. Topics in Architecture and Urban History. \***

Focuses on selected topics in the history of art and visual culture. Topics vary depending on

instructor. May be repeated for credit. The Staff

### **191M. Museum Exhibitions. \***

Students create and install and 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. Prerequisite(s): courses 100A and 141M. Enrollment restricted to History of Art and Visual Culture majors and minors. Enrollment by instructor permission. Prerequisite(s): course 141M or by permission of the instructor. E. Cameron

### **191N. Topics in Renaissance Art and Visual Culture. \***

Seminar on changing topics related to the current scholarship on the art and visual culture of the Renaissance. May be repeated for credit. The Staff

### **191O. Topics in Oceanic Visual Culture. \***

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. May be repeated for credit. (General Education Code(s): CC.) S. Kamehiro

### **191P. Topics in Contemporary Art. \***

Addresses changing topics in contemporary art. The specific topic varies with each offering to keep up with new directions in scholarship. May be repeated for credit. (General Education Code(s): IM.) The Staff

**191R. Art of the Book in Western Europe 500-1600. \***

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. E. Remak-Honnef

**191S. Topics in American Art and Visual Culture. \***

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. May be repeated for credit. (General Education Code(s): IM.) The Staff

**193F. History of Art and Visual Culture Service Learning (2 credits). F,W,S**

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. May be repeated for credit. (General Education Code(s): PR-S.) The Staff

**195. Senior Thesis. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**198. Independent Field Study. F,W,S**

Independent field study away from the campus. Students submit petition to sponsoring agency. The Staff

**198F. Independent Field Study (2 credits). F,W,S**

Independent field study away from the campus. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199. Tutorial. F,W,S**

Individual study in areas approved by sponsoring instructors. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S**

Individual study in areas approved by sponsoring instructors. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**GRADUATE COURSES**

**201A. Introduction to Visual Studies and Critical Theory. F**

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. (Formerly course 201, Introduction to Visual Studies.) Enrollment restricted to graduate students. A. Narath

**201B. Introduction to Visual Studies and Critical Theory. W**

Introduces the visual studies discipline and primary texts that have made significant contributions to it. Explores theoretical discourses that have proven influential and productive for practitioners of visual studies, in a range of thematic foci and cultural contexts. Features intensive readings and student-led discussions. Students continue to work on the research topic they selected in course 201A. (Formerly course 202, Theories of the Visual Critical Theory.) Enrollment restricted to graduate students. M. Evangelatou

**202. Introduction to Visual Studies Methods. S**

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. Enrollment is restricted to graduate students. J. Gonzalez

**204. Grant Writing (2 credits). W**

Devoted entirely to writing grant proposals. Students work on grants for educational support, their doctoral dissertation grants, or both. (Also offered as Film and Digital Media 204. Students cannot receive credit for both courses.) Enrollment restricted to visual studies and film and digital media graduate students. Enrollment limited to 15. May be repeated for credit. The Staff

**212. Yoruba Visualities and Aesthetics. \***

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. Enrollment restricted to graduate students. E. Cameron

**213. Theories and Visual Cultures of Iconoclasm. \***

Examines theories that attempt to explain iconoclasm, the willful destruction of religious or political objects, by applying the theory to various case studies. The universal aspect of iconoclasm and the differences in understanding and practice are explored. Enrollment restricted to graduate students. E. Cameron

**220. Topics in Asian Visual Studies. W**

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. Enrollment restricted to graduate students. May be repeated for credit. B. Ly

**222. The Image of Arhat in China. \***

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. Enrollment restricted to graduate students. R. Birnbaum

**224. Engaged Buddhism and Visual Culture. \***

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. Enrollment restricted to graduate students. B. Ly

**232. The Monument Since 1750 in Relation to Nationhood and the Experience of War. \***

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. Enrollment restricted to graduate students. D. Hunter

**233. Topics in Contemporary Art and Visual Culture. S**

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. Enrollment restricted to graduate students. May be repeated for credit. D. Murray

**235. Photography and History. \***

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. Enrollment restricted to graduate students. The Staff

**240. Seeing Race. \***

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. Enrollment restricted to graduate students. M. Berger

**241. Decolonizing Contemporary Art and Ecology. F**

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. Enrollment is restricted to graduate students. T. Demos

**243. Alternative Architecture. \***

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.) Enrollment restricted to graduate students. The Staff

**245. Race and Representation. \***

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. (Also offered as Feminist Studies 245. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. J. Gonzalez

**250. The Cult of Mary in Byzantium: Visualities of Political, Religions, and Gender Constructs. \***

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. (Formerly The Cult of Mary in Byzantium.) Enrollment restricted to graduate students. M. Evangelatou

**260. Visual Literacy in Spanish America, 1500-1800. \***

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. Enrollment restricted to graduate students. C. Dean

**270. Colonial Cultures of Collecting and Display. \***

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.

Enrollment restricted to graduate students. S. Kamehiro

**280. Visual Studies Issues. \***

Examines selected and changing issues in visual studies. The specific issue varies with each offering to keep pace with recent directions in scholarship. Enrollment restricted to graduate students. May be repeated for credit. C. Dean

**294. Teaching-Related Independent Study. F,W,S**

Directed graduate research and writing coordinated with the teaching of undergraduates. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**295. Directed Reading. F,W,S**

Directed reading that does not involve a term paper. Students submit petition to course-sponsoring agency. Enrollment

restricted to graduate students. May be repeated for credit. The Staff

**297. Independent Study. F,W,S**

Independent study or research for graduate students. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**297F. Independent Study (2 credits). F,W,S**

Students submit petition to course-sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**299. Thesis Research. F,W,S**

Students submit petition to course sponsoring agency. Enrollment restricted to graduate students. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# HISTORY OF CONSCIOUSNESS

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2015-16 General Catalog

415 Humanities 1

(831) 459-2757

<http://histcon.ucsc.edu/>

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## PROGRAM DESCRIPTION

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History of consciousness is an interdisciplinary graduate program (including a selection of undergraduate courses) 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.

Over more than 30 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.

History of consciousness 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 has strong cooperative relations with associated faculty from other campus programs who offer seminars and participate in advising, qualifying examinations, and dissertation committees. The formal list of associated 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 Institute for Humanities Research, Critical Race and Ethnic Studies, the Science and Justice Working Group, and the Chicano/Latino Research Center, also provide venues for collaborative work.

History of consciousness has developed a new vision for its graduate program involving the creation of projects (called concentrations) as part of a two-year admissions cycle.

The department admits outstanding students regardless, and students may change the foci of their study as their intellectual interests develop. Students already enrolled in other UCSC departments and all students in history of consciousness are eligible to take the graduate courses offered within a specific concentration. A given concentration topic will be in effect for two admissions cycles; after that, the focus of the concentration changes. Students may choose to participate in the concentration at any time during their first two years of coursework; colloquia and other research projects may continue to be offered in a given concentration for up to two years beyond the concentration admissions cycle.

This approach seeks to foster the 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 project concentration approach to graduate education formalizes that goal through an expanded inclusion of faculty and students from other UCSC departments engaged as a consortium in related endeavors. Each sequential concentration invites the participation of faculty from other departments.

Current concentration requirements do not differ from the regular program requirements, except in course

content. Concentration descriptions and guidelines may be obtained at the department office or on the web site.

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## REQUIREMENTS FOR THE DOCTORAL PROGRAM

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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 of the first year;
- A minimum of five history of consciousness graduate seminars during the first two years;
- A writing-intensive “B” seminar, either 203B, Approaches, or a “B” seminar following another seminar the student has taken (to be taken in the first year). “B” courses normally do not count toward the five seminars selected to fulfill the basic department requirement (exceptions may be granted);
- HISC 291, a two-credit advising course, each quarter;
- Three quarters of supervised teaching experience;
- 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);
- A qualifying examination (with written and oral components);
- A dissertation (written in conjunction with HISC 299, Thesis Research).

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 299) plus the 2-credit HISC 291 in order to qualify for full-time enrollment. With the exception of 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.

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.

The qualifying examination includes a written and oral component. The written component consists of a qualifying essay (normally 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.

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 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 web sites for information).

More 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 (<http://graddiv.ucsc.edu>) and on the department web site: <http://histcon.ucsc.edu>.

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## APPLICATIONS

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The deadline for applications to the History of Consciousness program is December 10 of each year. Admissions information and application materials are available online at [graddiv.ucsc.edu](http://graddiv.ucsc.edu). 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 required as is a writing sample 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.

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### DESIGNATED EMPHASIS

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To receive a designated emphasis in history of consciousness, 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 History of Consciousness Department office.

**The following are required for the emphasis:**

1. The student must have a faculty graduate adviser from core or affiliate faculty in history of consciousness, who serves both on the qualifying

examination committee and the dissertation reading committee.

2. The student must take four graduate courses in history of consciousness. With the approval of the history of consciousness adviser, one of the four required graduate courses may be an independent study.

**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 adviser'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.

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## HISTORY OF CONSCIOUSNESS FACULTY AND PROFESSIONAL INTERESTS

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**Gopal Balakrishnan, Associate Professor of History of Consciousness**

Classics of political thought from Plato to Rousseau, early modern and modern European intellectual history, historical sociology, the history and future of capitalism, nationalism

**Barbara L. Epstein, Professor Emerita of History of Consciousness**

Social movements and theories of social movements, 20th-century U.S. politics and culture, Marxism and related theories of social change; modern Jewish history

**Carla Freccero, Professor of Literature**

Renaissance studies; French and Italian language and literature; early modern studies, postcolonial theories and literature; contemporary feminist theories and politics; queer theory; U.S. popular culture; posthumanism; animal studies

**David S. Marriott, Professor of History of Consciousness**

Poetics, black cultural studies, literary and psychoanalytic theory, visual culture studies, black cultural theory and philosophies of race, caribbean modernism, Fanon studies

**Robert L. Meister, Professor of Politics and History of Consciousness**

Critical human rights theory; moral philosophy; political jurisprudence; political theology; political

economy; psychoanalysis; Marxian theory; financialization; 21st-century capitalism; institutional analysis; historical justice; and antidiscrimination law

**Eric Porter, Professor of History, and History of Consciousness**

Black cultural and intellectual history; U.S. cultural history and cultural studies; critical race and ethnic studies; jazz and popular music studies; urban studies

**Victor Burgin, Professor Emeritus of History of Consciousness**

**James T. Clifford, Professor Emeritus of History of Consciousness**

**Angela Y. Davis, Professor Emerita of History of Consciousness and Feminist Studies**

**Teresa de Lauretis, Professor Emerita of History of Consciousness, Literature, and Film and Digital Media**

**Donna J. Haraway, Professor Emerita of History of Consciousness and Feminist Studies**

**Hayden White, Professor Emeritus of History of Consciousness**

**AFFILIATED FACULTY**

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**Martin Berger, Professor of History of Art and Visual Culture**

Gender, race, and representation in U.S. culture

**Christopher Connery, Professor of Literature**

World literature and cultural studies, globalism and geographical thought, the 1960s, Marxism, pre-modern and modern Chinese cultural studies, cultural revolution

**Nathaniel Deutsch, Professor of Literature and History**

Modern Jewish history; Eastern European Jewish culture; ethnography, Hasidism; history of religions

**Jennifer A. González, Professor of History of Art and Visual Culture**

Contemporary theories of visual culture, semiotics, critical museum studies, photography, public and activist art in the U.S.

**Deborah Gould, Associate Professor of Sociology,**

Political emotion; social movements and contentious politics; classic and contemporary social theory; sexualities; lesbian/gay/queer studies; feminist and queer theory

**Megan Thomas, Associate Professor of Politics**

Political theory, especially of the 19th century; nationalist thought; Orientalism; comparative colonialism; Southeast Asia

**Tyrus Miller, Professor of Literature**

Modernist, avant-garde, and postmodernist literature; the interrelations of the arts in the 20th century; aesthetics theory; communist and post-communist society, intellectual history, and culture, especially in East-Central and Southern Europe; cinema and film theory; the Frankfurt School; György Lukács; contemporary poetry and language arts

**Jennifer Reardon, Professor of Sociology**

Issues of social identity as influenced by the new sciences of genetics and genomics; intersection of the sociology of science and knowledge and the sociology of race, gender, and class

**Vanita Seth, Associate Professor of Politics**

Early modern and modern political theory, feminist theory, cultural history, race politics, postcolonial theory

**ASSOCIATED FACULTY**

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**Anjali Arondekar, Associate Professor of Feminist Studies**

South Asian studies, colonial historiography; feminist theories; queer theory; critical race studies; 19th-century interdisciplinary studies

**Karen Barad, Professor of Feminist Studies**

Feminist science studies, materialism, deconstruction, poststructuralism, posthumanism, multi-species studies, science and justice, physics, 20th-century continental philosophy, epistemology, ontology, ethics,

philosophy of physics, feminist, queer, and trans theories

**A. Hunter Bivens, Associate Professor of Literature**

Twentieth- and 21st-century German literature and film; Marxism and critical theory; psychoanalysis; lyric poetry; literary realism; the novel

**Vilashini Cooppan, Associate Professor of Literature**

Postcolonial studies, comparative and world literature, literatures of slavery and diaspora, globalization studies, cultural theory of race and ethnicity

**Gina Dent, Associate Professor of Feminist Studies, History of Consciousness, and Legal Studies**

Africana literary and cultural studies, legal theory, popular culture

**Mayanthi Fernando, Associate Professor of Anthropology**

Anthropology of religion, secularism, Islam, multiculturalism/pluralism; colonial and post-colonial France, Europe

**Rosa-Linda Fregoso, Professor Emerita of Latin American and Latino Studies**

**Susan Gillman, Professor of Literature**

Transnational American studies; literatures of the 19th-century Americas; critical race studies; translation theory; comparative history of slavery and emancipation; world literature and cultural studies

**Wlad Godzich, Professor of Literature**

Theory of literature; philosophy and literature; emergent literature; translation theory; globalization and culture; European integration; knowledge society; literatures of Africa, the Caribbean, Europe (Central, Eastern, and Western), Brazil, Canada; detective and crime fiction; science fiction; medicine and literature

**Herman S. Gray, Professor of Sociology**

Cultural studies, media and television studies, black cultural politics, social theory

**Jody Greene, Professor of Literature and Feminist Studies**

Seventeenth- and 18th-century British literature and culture; pre- and early modern studies; critical theory, especially Derrida; poststructuralism and ethics; gender studies; history of authorship; history of the book; human property

**Susan Harding, Professor Emerita of Anthropology**

**Gail Hershatter, Professor of History**

Modern Chinese social and cultural history; labor history; gender history; history of sexuality; feminist theory; history, memory, and nostalgia

**David C. Hoy, Emeritus Professor of Philosophy**

**Kimberly Jannarone, Professor of Theater Arts**

Directing, dramaturgy, dramatic theory and criticism, theater history, acting

**Sharon Kinoshita, Professor of Literature**

Mediterranean studies; medieval francophone and Mediterranean literature; literature, translation, and empire; postcolonial and globalization theory; Marco Polo; world literature and cultural studies

**Kimberly Lau, Professor of Literature; Provost, Oakes College**

Feminism, discourse, and power; feminist theory; discourse, analysis, and ethnographic methods; folklore and narrative; globalization

**Dean Mathiowetz, Associate Professor of Politics**

Political theory, philosophy of language, classical and critical political economy

**Helene Moglen, Professor Emerita of Literature and Feminist Studies**

**Triloki Nath Pandey, Professor of Anthropology**

Native peoples of North America, cultures of India, political anthropology, anthropological theories and comparisons; native North America; tribal India; Nepal

**Ravi Rajan, Associate Professor of Environmental Studies**

Environmental history and political ecology, risk and disaster studies, science and technology studies, North-South environmental conflicts, environmental social theory, environmental ethics

**B. Ruby Rich, Professor of Community Studies**

Documentary film and video, post-9/11 culture, new queer cinema, feminist film history, Latin American and Latin/a cinema, U.S. independent film and video, the essay film, the politics of film festival proliferation and the marketing of foreign films in the U.S.

**Warren Sack, Professor of Film and Digital Media**

Software design and media theory

**Daniel Selden, Professor of Literature**

Afroasiatic languages and literatures, Greek and Latin, Hellenistic culture, the classical tradition, history of criticism, literary theory

**Richard Terdiman, Professor Emeritus of Literature**

**Anna Tsing, Professor of Anthropology**

Culture and politics; feminist theory; globalization; multi-species anthropology; social landscapes and tropical forest ethnocologies; multi-sited ethnography; Indonesia, Southeast Asia, and the U.S.

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## HISTORY OF CONSCIOUSNESS COURSES

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### LOWER-DIVISION COURSES

**12. Historical Introduction to Philosophy. F**

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. (General Education Code(s): TA, IH.) J. Neu

**80U. Modernity and Its Discontents.\***

Offers an introduction to the idea of modernity from Kant to Freud, Nietzsche to Fanon. (General Education Code(s): T4-Humanities and Arts.) D. Marriott

**85. Politics and Religion. W**

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. (Formerly course 114.) R. Meister

### UPPER-DIVISION COURSES

**102. Philosophy and Poetics.\***

Introduction to the relationship between philosophy and poetics in some major 19th- and 20th-century poets and thinkers. Enrollment restricted to juniors and seniors. Enrollment limited to 30. D. Marriott

**111. States, War, Capitalism.\***

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. Enrollment restricted to juniors and seniors. Enrollment limited to 35. G. Balakrishnan

**112. Foundations in Critical Theory. F**

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. Enrollment limited to 150. (General Education Code(s): TA.) G. Balakrishnan

**115. Comedy and the Question of the Comic. \***

Introduces the concept of the comic; how the concept of the comic has been theorized at times, from antiquity to the 20th century; forms the comic has taken and how it structures our experiences; and theories of the comic. (General Education Code(s): TA.) M. Holohan

**118. Jewish Social Movements. \***

Jewish social movements of the late 19th and 20th centuries, in Europe (Eastern and Western) and the U.S.: the confrontation between Hasidism and Haskahah, tensions between socialism and Zionism, between religiosity and secularism, the mutual influences among these tendencies. (Also offered as History 185D. Students cannot receive credit for both courses.) Enrollment restricted to juniors and seniors. Enrollment limited to 20. (General Education Code(s): E.) The Staff

**119. Politics of Recognition. \***

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. R. Meister

**125. Queerness and Race. \***

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. Enrollment limited to 25. The Staff

**136. On Insults. \***

What is the role of insult in social and legal life (from play to jokes to ritual to war and from blasphemy to defamation to hate speech)? Emphasizes philosophical, anthropological, psychoanalytic, and legal approaches to the issues. J. Neu

**139A. Market Crises and the Future of Capitalism. W**

Examines the development and role of late 20th- and early 21st-century financial technologies in modern market crises. Enrollment limited to 40. The Staff

**139B. Materialism and Financial Markets. S**

Continuation of course 139A. Examines the development and role of late 20th- and early 21st-century financial technologies in modern market crises. Enrollment limited to 40. The Staff

**146. Philosophy of Law. \***

Exploration of selected problems in jurisprudence: "legal reasoning" and social policy, rules and individual cases, the mental element in the law, punishment and responsibility, causation and fault, liberty and paternalism, etc. (Formerly Philosophy 146.) (Also offered as Legal Studies 146. Students cannot receive credit for both courses.) J. Neu

**163. Freud. \***

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. (Formerly Psychology 163 and Philosophy 139.) Offered in alternate academic years. J. Neu

**180. The Emotions. W**

Analysis of particular emotions (e.g., jealousy, boredom, regret) and exploration of general theoretical issues (e.g., expression, control) with emphasis on moral psychology. Admission by interview with instructor. Enrollment restricted to sophomores, juniors, and seniors. Enrollment limited to 23. J. Neu

**190A. Jewish Socialism in Eastern Europe, 1880-1953. \***

Looks at the ongoing debate in Jewish resistance during the Second World War and ends by addressing the status of Jews and Jewish movements in the Soviet Union and Poland after the war. (Also offered as Jewish Studies 190A. Students cannot receive credit for both courses.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 25. B. Epstein

**199. Tutorial. F,W,S**

A program of individual study arranged between an undergraduate student and a faculty member. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

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**GRADUATE COURSES**

**203A. Approaches to History of Consciousness. F**

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

## History of Consciousness

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. (Formerly course 203.) E. Porter

### **203B. Approaches to History of Consciousness. S**

Writing-intensive course based on readings in course 203A. Prerequisite(s): course 203A. Enrollment restricted to graduate students. Enrollment limited to 9. G. Balakrishnan

### **210A. Cultural and Historical Studies of Race and Ethnicity. \***

Explores the historical construction of racial and ethnic categories in the Americas, especially the U.S., in interaction with gender, sexuality, class, and nationality. Intended to introduce current work by UCSC faculty and Bay Area scholars and to stimulate graduate student research projects, the course is organized by intensive reading around key questions, followed by presentations by invited scholars. Emphasizes research resources and methodologies. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

### **210B. Cultural and Historical Studies of Race and Ethnicity. \***

Writing intensive course based on readings in course 210A. Prerequisite(s): course 210A. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

### **211A. French Hegel. \***

Introduces the "return to Hegel" in the work of some major 20th-century French thinkers. Enrollment restricted to graduate students. Enrollment limited to 15. D. Marriott

### **212. Feminist Theory and the Law. \***

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. (Also offered as Feminist Studies 212. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. Enrollment limited to 15. G. Dent

### **216. Critical Race/Ethnic Studies. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. E. Porter

### **222B. Theories of Late Capitalism. \***

Writing intensive course based on readings in course 222A. (Formerly Theories of Late Capitalism, Nationalism, and the Politics of Identity.) Prerequisite(s): course 222A. Enrollment restricted to graduate students. Enrollment limited to 15. B. Epstein

### **230A. Poetry, Language, Thought. \***

Introduces the relation between philosophy and poetics in some major 20th-century poets and thinkers. Enrollment restricted to

graduate students. Enrollment limited to 15. D. Marriott

### **230B. Poetry, Language, Thought. \***

Writing-intensive course based on readings in course 230A. Prerequisite(s): course 230A, or permission of instructor. Enrollment limited to 15. D. Marriott

### **236. On Insults. \***

What is the role of insult in social and legal life (from play to jokes to ritual to war and from blasphemy to defamation to hate speech)? Emphasizes philosophical, anthropological, psychoanalytic, and legal approaches to the issues. Enrollment restricted to graduate students and by permission of instructor. (Formerly Philosophy 290Y.) (Also offered as Anthropology 236. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. J. Neu

### **237A. Historical Materialism. F**

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. Enrollment restricted to graduate students. Enrollment limited to 15. May be repeated for credit. G. Balakrishnan

### **237B. Historical Materialism. \***

Writing-intensive seminar based on course 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. Enrollment restricted to graduate students. Enrollment limited to 10. May be repeated for credit. G. Balakrishnan

**240. Basic Principles of University-Level Pedagogy (1 credit). \***

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. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**242A. Violence and Phenomenology:**

**Fanon/Hegel/Sartre. F**

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. Enrollment restricted to graduate students. Enrollment limited to 15. D. Marriott

**242B. Violence and Phenomenology:**

**Fanon/Hegel/Sartre. W**

Writing intensive course based on readings in course 242A. Prerequisite: course 242A. Enrollment restricted to graduate students. Enrollment limited to 15. D. Marriott

**243A. Nationalism, Anti-Semitism, and Jewish Resistance in World War II. \***

Jewish resistance to Nazism during World War II, in Eastern Europe, and its historical context. Includes the pre-war rise in nationalism and anti-Semitism in Poland and Lithuania, Jewish integration in the Soviet Union, and the consequences for wartime resistance. (Also offered as History 256. Students cannot receive credit for both

courses.) Enrollment restricted to seniors and graduate students. Enrollment limited to 15. B. Epstein

**245. Race and Representation. \***

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. (Also offered as Feminist Studies 245. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. J. Gonzalez

**246. Black Radicalism. \***

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. Enrollment is restricted to graduate students. E. Porter

**252. Poststructuralism. \***

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. (Also offered as Philosophy 252. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. May be repeated for credit. The Staff

**256A. Theories of the Visual. \***

Study of psychoanalytic theories of the visual including the emergence of psychoanalysis and cinema as parallel discourses and the mobilization of key psychoanalytic concepts—scopophilia, voyeurism, fetishism—in Freudian and Lacanian understandings of the gaze so central to film and

photographic theory. Enrollment restricted to graduate students. Enrollment limited to 15. D. Marriott

**256B. Theories of the Visual. \***

Writing intensive course based on readings in course 256A. Prerequisite: course 256A. Enrollment restricted to graduate students. Enrollment limited to 15. D. Marriott

**261. Modern Intellectual History. W**

Survey of 19th- and 20th-century intellectual history that focuses on a cross-section of major works from Hegel to Levi-Strauss. Enrollment restricted to graduate students. Enrollment limited to 15. G. Balakrishnan

**262. Critical Theory After Habermas. \***

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(s): Enrollment restricted to graduate students. T. Miller

**264. The Idea of Africa. \***

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. (Also offered as Feminist Studies 264. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. Enrollment limited to 15. G. Dent

## History of Consciousness

### **268A. Rethinking Capitalism. \***

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). (Also offered as Anthropology 268A. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. Enrollment limited to 15. R. Meister

### **268B. Rethinking Capitalism. \***

Course 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? (Also offered as Anthropology 268B. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. Enrollment limited to 15. R. Meister

### **275. Sovereignties. F**

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. Enrollment is restricted to graduate students. D. Marriott

### **280. The Emotions. \***

Analysis of particular emotions (e.g., jealousy, boredom, regret) and exploration of general theoretical issues (e.g., expression, control) emphasizing philosophical and psychoanalytical approaches to understanding moral psychology. Enrollment is restricted to graduate students. J. Neu

### **291. Advising (2 credits). F,W,S**

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. May be repeated for credit. The Staff

### **292. Practicum in Composition. \***

A practicum in the genres of scholarly writing, for graduate students working on the composition of their qualifying essay or doctoral dissertation. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

### **293. Field Study. F,W,S**

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. May be repeated for credit. The Staff

### **294. Teaching-Related Independent Study. F,W,S**

Directed graduate research and writing coordinated with the teaching of undergraduates.

Students submit petition to sponsoring agency. The Staff

### **295. Directed Reading. F,W,S**

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. May be repeated for credit. The Staff

### **296. Special Student Seminar. F,W,S**

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. May be repeated for credit. The Staff

### **297. Independent Study. F,W,S**

Independent study and research under faculty supervision. Students submit petition to sponsoring agency. The Staff

### **298. Doctoral Colloquium. S**

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. May be repeated for credit. The Staff

### **299. Thesis Research. F,W,S**

Prerequisite(s): advancement to candidacy. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# HUMANITIES

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2015-16 General Catalog

503 Humanities I

(831) 459-2696

<http://humanities.ucsc.edu/>

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## PROGRAM DESCRIPTION

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The Humanities Division offers a broad range of courses and programs that investigate and interpret the human experience. For current information, see <http://humanities.ucsc.edu>.

The following undergraduate majors (and in most cases minors) are offered: classical studies, critical race and ethnic studies, feminist studies, German studies, history, Italian studies, Jewish studies, language studies, linguistics, literature, philosophy, and Spanish studies. In addition, there is a minor in East Asian studies.

At the graduate level, the Ph.D. (and in most cases, the M.A.) are offered by programs in feminist studies,

history, history of consciousness, linguistics, literature, and philosophy.

The Writing Program offers courses and assessments related to university and campus writing requirements and collaborates with the undergraduate colleges in delivering the college core courses.

The Institute for Humanities Research is a laboratory for theorizing and implementing new visions of the humanities via faculty research projects, graduate and undergraduate education, and public programs. For more information, see <http://ihr.ucsc.edu>.

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## FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**Jerome Neu, Emeritus**

**Forrest G. Robinson, Emeritus**

Revised: 09/01/15

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# ITALIAN

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2015-16 General Catalog

Department of Languages and Applied Linguistics

218 Cowell College

(831) 459-2054

<http://language.ucsc.edu>

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## PROGRAM DESCRIPTION

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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 or minor in Italian studies, a major or minor in language studies, a major in literature with an emphasis in Italian literature, a major in global economics

The sequence of lower-division courses 1-6 is aimed at enabling students to gain proficiency in aural comprehension, speaking, reading, and writing. Courses 1A and 1B offer lower-division intensive Italian language instruction equivalent to levels 1, 2, 3. The 1, 2, 3 sequence starts once a year in the fall quarter, while the 1A-1B sequence starts once a year in the

winter quarter. Classes are taught in Italian from the beginning level.

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### CAMPUS LANGUAGE LABORATORIES AND PLACEMENT EXAMS

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Information about these topics can be found under [Department of Languages and Applied Linguistics](#).

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### STUDY ABROAD

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The Office of International Education (OIE) sponsors programs of study in Italy. For a list of current programs and requirements, visit their web site, <http://oie.ucsc.edu>.

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## ITALIAN FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**Margaret Brose, Emerita**

**Deanna Shemek (Literature)**

Renaissance Italian literature and culture; early modern feminism; humanism; letter-writing and epistolary culture; early modern literacy and media; Renaissance theater; the northern court circles; digital humanities

### LECTURER

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**Giulia Centineo**

Italian culture and civilization; history of Italian language; Italian linguistics, syntax, and semantics; language pedagogy, Italian cinema, dubbing, Italian migrations

**Maria (Tonia) Prencipe**

Technology and foreign language pedagogy; modern Italian culture, history, literature, and cinema; creative writing; promotion of Italian language and culture of K-12

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## ITALIAN COURSES

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### LOWER-DIVISION COURSES

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#### 1. First-Year Italian. F

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.

Enrollment is restricted to first-year and sophomore students during priority enrollment. The Staff

#### 1A. Accelerated Italian. W

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. Enrollment is restricted to first-year and sophomore students during priority enrollment. The Staff

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## Italian

### **1B. Accelerated Italian. S**

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. (Formerly Intensive Elementary Italian.) Prerequisite(s): course 1A or 2 or placement by examination. For students completing course 2, course 3 is preferable. The Staff

### **2. First-Year Italian. W**

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. (Formerly Instruction in the Italian Language.) Prerequisite(s): course 1 or placement by examination. The Staff

### **3. First-Year Italian. S**

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). (Formerly Instruction in the Italian Language.) Prerequisite(s): course 2 or placement by examination. The Staff

### **4. Second-Year Italian. F**

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. (Formerly Intermediate Italian.) Prerequisite(s): course 1B or 3 or placement by examination. (General Education Code(s): CC, IH.) The Staff

### **5. Second-Year Italian. W**

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. (Formerly Intermediate Italian.) Prerequisite(s): course 4 or placement by examination. (General Education Code(s): CC, IH.) The Staff

### **6. Second-Year Italian. S**

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. (Formerly Intermediate-Advanced Italian.) Prerequisite(s): course 5 or placement by examination. (General Education Code(s): CC, IH.) The Staff

### **94. Group Tutorial. F,W,S**

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. May be repeated for credit. The Staff

### **99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **99F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## UPPER-DIVISION COURSES

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### **100. Advanced Italian**

#### **Composition and Conversation.**

#### **F**

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(s): course 6 or by permission of the instructor. M. Prencipe, The Staff

#### **106. Italian Culture Through Film. S**

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

## Italian

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 Languages 80D. Prerequisite(s):

course 6. May be repeated for credit. (General Education Code(s): CC.) G. Centineo, The Staff

### **194. Group Tutorial. F,W,S**

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. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

Revised: 09/01/15

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# ITALIAN STUDIES

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2015-16 General Catalog  
Department of Literature  
303 Humanities 1  
(831) 459-4778

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## PROGRAM DESCRIPTION

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Students interested in an interdisciplinary approach to Italian culture through the combined study of language, literature, history, art history, and other subjects may pursue a major or minor in Italian studies. The guidelines for the completion of the major may be obtained from Professor Deanna Shemek of the Literature Department or Professor Cynthia Polecristi of the History Department. There are several options for study in Italy through the UC Education Abroad Program (EAP), either for a year (Bologna, Milan, Padova), for an intensive semester (Bologna, Florence, Milan, Padova, Rome), or for the summer (Florence). Students may also divide their time between Italy and Spain for one semester or one quarter. The Italian studies program is administered by the Literature Department.

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### REQUIREMENTS OF THE MAJOR

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Each student must complete the lower-division language sequence (Italian 1–6, or equivalent). In addition, students are required to take 10 five-credit courses (one of which may be lower division), including a core unit of five courses which must be taken at UCSC: two Italian literature courses, Italian 106 (Italian Culture Through Film), one course in Italian history, and one course in Italian art history. A course featuring the work of Dante is recommended. A minimum of five courses must be taught substantially in Italian. Five may be approved elective courses, which may feature Italy in a European or global context. Up to five elective courses may be approved from UC EAP's yearlong study abroad in Italy. All students in the major must satisfy the Italian Studies senior exit requirement by writing a senior essay focused on Italian literature, history, or visual culture. This essay may be produced within an approved seminar, or (with faculty permission) by enrolling in a one-credit Italian Literature 191 course taken in conjunction with another upper-division course in Italian literature, history, or history of art and visual culture. This combination must be approved by a faculty adviser in Italian Studies.

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### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) Requirement. Italian studies majors satisfy the DC Requirement through satisfactory completion of the senior essay, as described above. Please refer to updated information at <http://registrar.ucsc.edu/catalog/programs-courses//disciplinary-communicationchart.html>.

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### MINOR REQUIREMENTS

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Each student must complete the lower-division language sequence (Italian 1–6, or equivalent). Students must also complete five upper-division courses in Italian studies: two Italian literature courses, Italian 106 (Italian Culture Through Film), one course in Italian history, and 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 UCSC; three must be taught substantially in Italian. A maximum of two courses may be transferred from EAP.

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### HONORS

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Honors in the Italian studies major are awarded to graduating seniors who have earned a 3.70 to 3.89 grade point average in their upper-division Italian studies courses. Highest honors in the Italian studies major are awarded to graduating seniors who have earned a 3.90 or higher grade point average in their upper-division Italian Studies courses. Honors are not awarded in the minor.

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### PROGRAM LEARNING OUTCOMES

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Following is a summary of the program learning outcomes for the Italian studies B.A.:

Students who complete the major should be able to demonstrate:

**A. Oral and written communication:** listening, speaking, and writing competency in Italian sufficient

## Italian Studies

to engage in meaningful conversation at the Intermediate-high to Advanced-mid level, according to the [American Council on the Teaching of Foreign Languages \(ACTFL\)](#).

**B. Textual comprehension and analysis:** ability to understand and appreciate Italian texts in a variety of registers and different areas of knowledge at the Advanced level as described by ACTFL (<http://actflproficiencyguidelines2012.org/reading>).

**C. Critical analysis:** ability to comment with critical insight on a range of topics in Italian history and contemporary culture.

**D. Cultural competency:** ability to demonstrate knowledge of historical and contemporary aspects of Italian culture with reference to study in several disciplines.

**E. Global engagement:** ability to recognize and reflect in an informed way on cultural differences as well as shared values between Italian culture and their own native cultures.

**F. Knowledge building:** ability to conduct research in both Italian and English on topics pertinent to Italian history and culture.

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### 2015-16 TENTATIVE ITALIAN STUDIES CURRICULUM

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#### FALL 2015

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ITAL 1, First-Year Italian (Centineo)

ITAL 4, Second-Year Italian (Prencipe)

**ITAL 100, Advanced Italian Composition and Conversation (in Italian)** (Prencipe)

**LTIT 161, Italian Short Fiction (in Italian)** (Shemek)

LTPR 183, Dante's "Divine Comedy" (Coggeshall)

WINTER 2016

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HAVC 137B, Italian Renaissance: Art and Architecture (Langdale)

HAVC 137E, Renaissance Prints (Langdale)

HIS 183A, Nineteenth-Century Italy (Polecritti)

HIS 196Y, Saints and Holiness in Medieval Europe (Polecritti)

ITAL 1A, Accelerated Italian (Prencipe)

ITAL 2, First-Year Italian (Centineo)

ITAL 5, Second-Year Italian (Prencipe)

**LTIT 165, Topics in Italian Literature and Culture: Literature and Migration (in Italian)** (Shemek)

SPRING 2016

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HAVC 151, Greek Myths Antiquity to the Present (Evangelatou)

HIS 183B, Fascism and Resistance in Italy (Polecritti)

ITAL 1B, Accelerated Italian (Prencipe)

ITAL 3, First-Year Italian (Centineo)

ITAL 6, Second-Year Italian (Prencipe)

**ITAL 106, Italian Culture Through Film (in Italian)** (Centineo)

LAAD 80, Italian Culture Through Cinema (Centineo)

**LTIT 170A, Modern Italian Poetry (in Italian)** (Coggeshall)

**Please note:** Courses in **bold** require completion of Italian 6 or equivalent proficiency.

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## ITALIAN STUDIES FACULTY

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### CORE PROGRAM FACULTY

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**Giulia Centineo**, Lecturer in Italian

**Cynthia Polecristi**, Associate Professor of History

**Maria (Tonia) Prencipe**, Lecturer in Italian

**Deanna Shemek**, Professor of Literature

### AFFILIATED FACULTY

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**Maria Evangelatou**, Associate Professor of History of Art and Visual Culture

**Carla Freccero**, Professor of Literature and Feminist Studies

**Charles W. Hedrick Jr.**, Professor of History

**Donna Hunter**, Professor of History of Art and Visual Culture

**Allan Langdale**, Lecturer of History of Art and Visual Culture

**Tyrus Miller**, Professor of Literature

**Eleonora Pasotti**, Associate Professor of Politics

**Daniel Selden**, Professor of Literature and Classics

**Nina Treadwell**, Associate Professor of Music

**James Wilson**, Lecturer with Security of Employment in Writing

### EMERITI FACULTY

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**Murray Baumgarten**, Emeritus, Literature

**Margaret R. Brose**, Emerita, Literature

**Mary-Kay Gamel**, Emerita, Literature

**Virginia Jansen**, Emerita, History of Art and Visual Culture

Revised: 09/01/15

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# JAPANESE

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2015-16 General Catalog

Department of Languages and Applied Linguistics

218 Cowell College

(831) 459-2054

<http://language.ucsc.edu>

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## PROGRAM DESCRIPTION

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Students interested in acquiring proficiency in Japanese can enroll in language courses from beginning to advanced levels. Instruction takes place mostly in Japanese from the second half of the first quarter. 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.

Students may use Japanese courses for the following majors and minors: a major in language studies; a major in linguistics; an East Asian minor or (individual major); a major in global economics; or a major in literature.

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### CAMPUS LANGUAGE LABORATORIES AND PLACEMENT EXAMS

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Information about these topics can be found under [Department of Languages and Applied Linguistics](#).

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### STUDY ABROAD

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The Office of International Education (OIE) has information on study in Japan. There are study abroad centers in Yokohama, Tsuru, Kyoto, Tokyo, Sendai, Tsukuba, and Tohoku. Courses taken abroad can, with approval of an adviser, be applied to major requirements. For a list of current programs and requirements, visit their web site, <http://oie.ucsc.edu>. For information on credit applied to a major, contact the appropriate department.

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## JAPANESE FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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#### **Shigeko Okamoto**

Sociolinguistics, discourse analysis, pragmatics, language and gender, foreign language pedagogy, Japanese linguistics

### ASSOCIATE PROFESSOR

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#### **Noriko Aso**

Japanese social, intellectual, and cultural history, material culture, colonialism, nationalism, gender, race and ethnicity

#### **Alan S. Christy**

Early modern and modern Japan; history of social sciences, colonialism, nationalism; Okinawa

### LECTURER

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#### **Mariko Bohn**

Sociolinguistics, language and gender, bilingualism, modern Japanese literature, language pedagogy

#### **Sakae Fujita**

Foreign language education, drama in education

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## JAPANESE COURSES

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### LOWER-DIVISION COURSES

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#### **1. First-Year Japanese. F**

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). (Formerly Instruction in the

Japanese Language.) The Staff

#### **2. First-Year Japanese. W**

Students carry out beginning-level tasks that involve listening, speaking, reading, and/or writing, and learn how to read and write 70 additional kanji. (Formerly Instruction in the Japanese

Language.) Prerequisite(s): course 1 or by consent of instructor. The Staff

#### **3. First-Year Japanese. S**

Students carry out beginning-level tasks that involve listening, speaking, reading, and/or writing, and learn how to read and write 70

## Japanese

additional kanji. (Formerly Instruction in the Japanese Language.) Prerequisite(s): course 2 or by consent of instructor. The Staff

### **4. Second-Year Japanese. F**

Students carry out intermediate-level tasks that involve listening, speaking, reading, and/or writing, and learn how to read and write 70 additional kanji. (Formerly Intermediate Japanese.) Prerequisite(s): course 3 or by consent of instructor. (General Education Code(s): IH.) The Staff

### **5. Second-Year Japanese. W**

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(s): course 4 or by consent of instructor. (General Education Code(s): CC, IH.) The Staff

### **6. Second-Year Japanese. S**

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. (Formerly Intermediate Japanese.) Prerequisite(s): course 5 or by consent of instructor. (General Education Code(s): CC, IH.) The Staff

### **94. Group Tutorial. F,W,S**

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. May be repeated for credit. The Staff

### **99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **99F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## **UPPER-DIVISION COURSES**

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### **103. Advanced Japanese. F**

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(s): course 6 or by consent of instructor. The Staff

### **104. Advanced Japanese. W**

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(s): course 103 or by consent of instructor. The Staff

### **105. Advanced Japanese. \***

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(s): course 104 or by consent of instructor. (General Education Code(s): TA.) The Staff

### **109. Japanese Language, Culture, and Society. S**

Studies the social and cultural aspects of the Japanese language. Topics include language planning; writing-system reform; standard Japanese; regional variation; honorifics; gender norms and practices; age variation; communication styles; loanwords and English; and minority languages and their speakers. Readings are in Japanese. Prerequisite(s): Japanese 104 or by consent of instructor. Enrollment limited to 25. S. Okamoto, The Staff

### **194. Group Tutorial. F,W,S**

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. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# JEWISH STUDIES

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2015-16 General Catalog

Department of History

201 Humanities

(831) 459-2982

<http://jewishstudies.ucsc.edu>

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## PROGRAM DESCRIPTION

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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 gain knowledge and skills in a variety of contexts in various aspects of Jewish culture, 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 UCSC 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 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 Shanghai, Tianjin, Harbin, India, Latin America, Egypt, Iran, and of course throughout Europe, Great Britain, and North America.

Jewish studies is administered by the Department of History. For additional information on curriculum and advising, go to <http://jewishstudies.ucsc.edu>.

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### PROGRAM LEARNING OUTCOMES

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#### JEWISH HISTORY AND CULTURE

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Identify and interpret major events, figures, and topics in Jewish history and culture.

#### HOLOCAUST

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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 modern or biblical Hebrew 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 your interpretations in written essays and/or other media.

#### SCOPE

---

Classical Period.

Modern Period.

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## REQUIREMENTS FOR THE MAJOR

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In consultation with a faculty adviser, students will plan a program of study to fulfill the following distribution of courses:

#### LANGUAGE

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- Three quarters of lower-division instruction in a Jewish language in any combination of the student's choosing: elementary Hebrew (Hebrew 1, Hebrew 2, Hebrew 3); Hebrew 80, Introduction to Biblical Hebrew; elementary Yiddish (Yiddish 1, Yiddish 2); or equivalent. Students with prior knowledge of Hebrew or Yiddish are advised to complete a language placement exam to determine if they have satisfied any of the elementary language course requirements. Instructions for the placement exam

can be found on the Languages and Applied Linguistics web site: <http://language.ucsc.edu>.

## COURSE REQUIREMENTS

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The major requires a minimum of 11 courses, including the comprehensive requirement. A minimum of 40 upper-division credits must be completed within the Jewish studies major course requirements.

- History 74, An Introduction to Jewish History and Culture, or Literature 61J, An Introduction to Jewish Literature and Culture
- Literature 80L, The Holocaust: The Destruction of European Jewry, History 75, Film and the Holocaust, or History 76, Hitler and the Holocaust
- two upper-division history core courses
- two upper-division literature core courses
- four additional core or elective courses, three of which must be upper-division
- one comprehensive exit requirement (see below)
- among the 11 courses required for the major, one course must satisfy the Disciplinary Communications (DC) Requirement (see below)

**Distribution Requirements.** Among the 11 courses required for the major, at least three must meet the following chronological distribution requirements:

- one course must satisfy the classical chronological distribution requirement
- one course must satisfy the modern chronological distribution requirement
- one course must satisfy the Holocaust chronological distribution requirement, which is accomplished by completing Literature 80L, The Holocaust: The Destruction of European Jewry History 75, Film and the Holocaust, or History 76, Hitler and the Holocaust.

Please consult the Jewish studies web site for a more detailed description of these courses.

**Comprehensive Requirement.** Students may satisfy the Jewish studies comprehensive exit requirement by completing an approved exit seminar (one quarter: History 196G, 196M, 196N, 196P, 196R, History of Consciousness 190A/Jewish Studies 190A, Modern Literary Studies 190Y or Pre- and Early Modern Literature 190Y) or a senior thesis (Jewish Studies 195A and 195B). Please consult the Jewish studies web site for a more detailed description of these courses.

**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 (one quarter: History 196G, 196M, 196N, 196P, 196R, History of Consciousness 190A/Jewish Studies 190A, Modern Literary Studies 190Y, or Pre- and Early Modern Literature 190Y), or a thesis (two quarters: Jewish Studies 195A and 195B).

**Honors in the Jewish Studies Major.** All students who announce candidacy during the academic year are reviewed for honors or highest honors in the major. The Jewish studies faculty advisers 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.

**UC Education Abroad Program.** 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 below under "Transfer Credits and Substitutions," up to three courses from EAP may be applied toward the Jewish studies major requirements.

**Transfer Credits and Substitutions.** Jewish studies majors must take a minimum of five regularly scheduled Jewish studies courses plus the comprehensive/DC requirement from members of the UCSC Jewish studies faculty. Subject to the limits indicated, courses from the following categories may be applied to the Jewish studies major:

- Courses taken at another institution (limit of 3)
- Education Abroad Program (limit of 3)
- Related courses not currently on the pre-approved Jewish studies course list (limit of 2)
- Independent and field studies (limit of 1)

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## REQUIREMENTS FOR THE MINOR

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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 regular 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 Studies

Jewish topics, but without such plans, a minor in Jewish studies offers intellectual enrichment and a focus within the student's chosen field.

The minor requires a minimum of eight courses. A minimum of 25 upper-division credits 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:

- one of the following courses:
  - History 74, An Introduction to Jewish History and Culture; Literature 61J, An Introduction to Jewish Literature and

Culture; Literature 80L, The Holocaust: The Destruction of European Jewry; History 75, Film and the Holocaust; or History 76, Hitler and Holocaust

- three upper-division core courses from the Jewish studies curriculum;
- four additional core or elective courses from the Jewish studies curriculum, two of which must be upper-division.

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## JEWISH STUDIES PRINCIPAL FACULTY

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### **Bettina Aptheker, Professor of Feminist Studies**

Feminist oral history and memoir; feminist pedagogy; African-American feminist history; queer studies; feminist Jewish studies; feminist critical race studies

### **Murray Baumgarten, Emeritus of English and Comparative Literature**

**Dorian Bell, Assistant Professor of Literature**  
Nineteenth- and 20th-century French literature and intellectual history; histories of empire and anti-Semitism; literature and science; film studies; digital humanities

### **Margaret Brose, Emerita Professor of Literature**

### **Mark Cioc, Professor of History**

German history, modern European history; environmental history

### **Nathaniel Deutsch, Professor of History, , Neufeld-Levin Co-Chair**

Modern Jewish history; Eastern European Jewish culture; ethnography, Hasidism; history of religions

### **Barbara Epstein, Professor Emerita of History of Consciousness**

### **Gildas Hamel, Lecturer Emeritus in History and Classical Languages**

**Alma Heckman, Assistant Professor of History**  
Modern Jewish history; North Africa and the Middle East; labor history; transnational Jewish political activism; colonialism; nationalism; syncretism

### **Peter Kenez, Professor Emeritus of History, Neufeld-Levin Co-Chair**

### **Tammi Rossman-Benjamin, Continuing Lecturer in Hebrew**

Hebrew language and culture; biblical Hebrew syntax and semantics; the Hebrew Bible; Jewish thought; psycholinguistics; second language acquisition and bilingualism

### **Dan Selden, Professor of Literature**

Research on Classical and Hellenistic Judaism and medieval Jewish mysticism

### **Bruce Thompson, Continuing Lecturer in History**

European intellectual and cultural history, French history, Jewish intellectual and cultural history, British and Irish history, history of cinema, history of espionage, environmental history

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## JEWISH STUDIES FACULTY ADVISERS

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### **Nathaniel Deutsch, Professor of History**



### **Raoul Birnbaum, Professor of History of Art and Visual Culture**

Buddhist studies, especially Chinese practices from medieval times to the present; religion and visual culture in China

### **A. Hunter Bivens, Associate Professor of Literature**

Twentieth- and 21st-century German literature and

**Bruce Thompson, Continuing Lecturer in History**  
film; Marxism and critical theory; psychoanalysis; lyric poetry; literary realism; the novel

### **Ryan Coonerty, Lecturer in Politics**

American political history, law and international relations

### **Robert Goff, Associate Professor Emeritus of Philosophy**

### **Margo Hendricks, Professor Emerita of Literature**

**Loisa Nygaard, Associate Professor of Literature**

Eighteenth- and early 19th-century German literature; Goethe; Romantic fiction; landscape and landscape aesthetics; xenophobia in Germany

**Paul Roth, Professor of Philosophy**

Philosophy of social science, Quine, philosophy of history, philosophy and sociology of science, epistemology, history of analytic philosophy

**Avi Tchamni, Lecturer in Music**

Composition, Jewish music, computer and electronic music, Middle Eastern music, theory, algorithmic music and generative musical syntax, orchestration, ethnomusicology

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## JEWISH STUDIES COURSES

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### LOWER-DIVISION COURSES

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**99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### UPPER-DIVISION COURSES

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**190A. Jewish Socialism in Eastern Europe, 1880-1953. \***

Looks at the ongoing debate in Jewish resistance during the Second World War and ends by addressing the status of Jews and Jewish movements in the Soviet Union and Poland after the war. (Also offered as History of Consciousness 190A. Students cannot receive credit for both courses.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 25. The Staff

**195A. Thesis Research. S**

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. The Staff

**195B. Thesis Writing. S**

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. The Staff

**199. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# KRESGE COLLEGE

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2015-16 General Catalog

College Office  
(831) 459-2071

<http://kresge.ucsc.edu/>

For college description and list of faculty, see [Colleges](#).

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## KRESGE COLLEGE COURSES

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### LOWER-DIVISION COURSES

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#### **12A. Service Learning (3 credits). F**

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. Enrollment restricted to college members. Enrollment limited to 25. May be repeated for credit. (General Education Code(s): PR-S.) F. Williams

#### **12B. Service Learning (2 credits). S**

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. Enrollment restricted to college members. Enrollment limited to 25. May be repeated for credit. (General Education Code(s): PR-S.) F. Williams

#### **12C. Service Learning: Introduction to National Service/Introduction to Grant Writing (3 credits). \***

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. (Also offered as Porter College 13C. Students cannot receive credit for both courses.) Enrollment restricted to college members. (General Education Code(s): PR-S.) F. Williams

#### **15A. The Writer as Witness (3 credits). \***

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. Enrollment restricted to college members. Enrollment limited to 20. W. Cooper

#### **15B. The Writer as Witness (2 credits). \***

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. Enrollment restricted to college members. Enrollment limited to 20. W. Cooper

#### **16. The Rise of Capitalism and Its Consequences. \***

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? Enrollment restricted to Kresge, Cowell, or Crown honors students. (General Education Code(s): TA.) D. Gould

#### **24. Imagining Utopias (3 credits). \***

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. Enrollment restricted to college members. Enrollment limited to 20. W. Cooper

#### **25. Successful Transfer to the Research University (2 credits). F**

Provides first-quarter, community college transfers with an understanding of the workings of a research university with emphasis on advanced academic expectations. Encourages development of educational plans reflecting

effective academic strategies, short- and long-term goals, research and/or internship experiences, and graduate programs. Enrollment restricted to first-quarter transfer students. Enrollment limited to 25. The Staff

**26. Navigating the Research University (2 credits). F**

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 Porter 26 or Stevenson 26. Enrollment is restricted to first-year Kresge and Porter College members. The Staff

**42. Student-Directed Seminar (no credit). F,W,S**

Seminar taught by upper-division Kresge students under Kresge faculty supervision. (See course 192.) Students submit petition to sponsoring agency. The Staff

**60C. Prison Narratives (3 credits). S**

Seeks to ask hard questions about the role of the prison, its increasing use in our nation, and the use of torture by the U.S. government in Guantanamo, Abu Ghraib, and other prisons. Readings include J. James's *Imprisoned Intellectuals*, Alexander Berkman's *Prison Memoirs of an Anarchist*, and other writings by American prisoners. Eve Ensler's *What I Want My Words to Do to You* is shown. Course is primarily reading and discussion; students are asked to keep a reading journal and to write a critical/creative essay at the end of the quarter. (Formerly Language of the Prison House.) Prerequisite(s): satisfaction of the Entry Level Writing and

Composition requirements. Enrollment restricted to college members. Enrollment limited to 20. W. Cooper

**60F. Writer's Read (2 credits). \***

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. Enrollment restricted to Kresge and Porter college members. Enrollment limited to 35. May be repeated for credit. M. Perks

**60K. The Art of Comedy: Literature and Performance (3 credits). \***

Students analyze comedic writing and practice writing comedy. Students develop pieces to be delivered in a performance at the end of the quarter. Enrollment restricted to college members. Enrollment limited to 22. E. McKenzie

**62. Transformative Action. \***

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. Enrollment limited to 75. (General Education Code(s): PR-S.) C. King

**62A. Transformative Action (2 credits). \***

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. The Staff

**62B. Transformative Action Seminar (2 credits). \***

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. C. King

**63. Kresge Garden Cooperative (2 credits). S**

Offers hands-on gardening skills within a student-run space. Focuses on developing a strong cooperative garden on campus, with special attention to the documentation of this process. Enrollment by instructor approval through application (available in the Kresge College office). Enrollment limited to college members. Enrollment limited to 24. May be repeated for credit. D. Shaw

**64. Tools for World Changers (2 credits). W**

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. D. Shaw

**65. Power and Representation Lab. \***

Enrollment limited to 20. The Staff

**65A. Power and Representation: Food and Community (2 credits). F**

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. (Formerly Power and Representations: Food Systems.) Concurrent enrollment in course 80A, 80B, or 80C is required. Enrollment limited to 20. D. Shaw

**65B. Power and Representation: Photography (2 credits). F**

Focuses on creating a final project individually, or in collaboration with others, that engages issues of power and representation through the medium of photography. Concurrent enrollment in course 80A, 80B, or 80C is required. Enrollment limited to 20. S. Graham

**65C. Power and Representation: Creative Writing (2 credits). F**

For students who wish to supplement their core experience with creative writing. Students do in-class and out-of-class writing assignments; read and discuss texts; and work to develop their final project. Concurrent enrollment in course 80A, 80B, or 80C is required. Enrollment limited to 20. The Staff

**65D. Power and Representation: Poetry and Musical Performance (2 credits). F**

Students investigate the themes presented in the core course to arrive at a final creative project in pairs, groups, or individually. (Formerly Power and Representation: Art and Visual Performance.) Concurrent enrollment in course 80A, 80B, or 80C is required. Enrollment limited to 20. B. Carson

**67. Transformative Justice Seminar (3 credits). W**  
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. This seminar is a continuation of the concepts taught in course 62, Transformative Action. Enrollment by instructor consent. Priority given to students who have taken course 62. Enrollment restricted to frosh, sophomores, and juniors. Enrollment limited to 25. C. King

**68. Transformative Communication (2 credits). S**  
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. Enrollment restricted to frosh, sophomores, and juniors by permission of instructor. Priority given to students enrolled in course 67, Transformative Justice. Enrollment limited to 25. C. King

**69. Practical Application of Restorative Practices (2 credits). \***  
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(s):

course 67. Enrollment restricted to sophomores, juniors, and seniors. May be repeated for credit. C. King

**72. Collaborative Learning: The Great Turning (2 credits). \***  
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. (General Education Code(s): PR-E.) D. Shaw

**73. Collaborative Learning: Sustainable Communities (2 credits). \***  
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. (General Education Code(s): PR-E.) D. Shaw

**74. Collaborative Learning: Permaculture Skills (2 credits). \***  
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. (General Education Code(s): PR-E.) D. Shaw

**75. Sustainable Food Systems. \***  
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. Enrollment limited to 55. S. Gillon

**76. Social Documentary Photography. \***

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. Enrollment restricted to Kresge College members. Enrollment limited to 20. The Staff

**77. Food Memoir (2 credits). \***

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. Enrollment restricted to Kresge and College Eight members or by permission of instructor. R. Somers

**80A. Introduction to University Discourse: Power and Representation. F**

Explores rhetorical principles and conventions of university discourse, providing intensive practice in analytical writing, critical reading, and speaking. Explores relationships between individuals and their communities—communities as small as families and friends, colleges and cities; communities as large as nations and the world. Examines ways we constitute ourselves as individuals in relation to communities, focusing on representations of class, ethnicity, sexual orientation, gender, and race in several

genres—critical theory, film, art, fiction, non-fiction, and theater. Students cannot receive credit for this course and course 80B. Enrollment restricted to first-year college members who have not satisfied the C1 requirement. (General Education Code(s): T5-Humanities and Arts or Social Sciences, C1.) The Staff

**80B. Rhetoric and Inquiry: Power and Representation. F**

Explores the intersections of investigations, interpretation, and persuasion, and hones strategies for writing and research. Explores relationships between individuals and their communities—communities as small as families and friends, colleges and cities; communities as large as nations and the world. Examines ways we constitute ourselves as individuals in relation to communities, focusing on representations of class, ethnicity, sexual orientation, gender, and race in several genres—critical theory, film, art, fiction, non-fiction, and theater. Students cannot receive credit for this course and course 80A. Prerequisite(s): satisfaction of the Entry Level Writing and C1 requirements. Enrollment restricted to first-year college members. (General Education Code(s): T5-Humanities and Arts or Social Sciences, C2.) The Staff

**80C. Introduction to University Discourse: Power and Representation--Writing Intensive 1. F**

Explores rhetorical principles and conventions of university discourse, providing intensive practice in analytical writing, critical reading, and speaking. Explores relationships between individuals and their communities--communities as small as families and friends, colleges, and cities;

communities as large as nations and the world. Examines ways we constitute ourselves as individuals in relation to communities, focusing on representations of class, ethnicity, sexual orientation, gender, and race in several genres--critical theory, film, art, fiction, non-fiction, and theater. More writing intensive than course 80A; prerequisite to course 80D. Enrollment restricted to first-year college members who have not satisfied the Entry Level Writing and C1 requirement and who scored a 5 or lower on the AWPE (Analytical Writing and Placement Exam). Enrollment limited to 22. The Staff

**80D. Introduction to University Discourse: Power and Representation--Writing Intensive 2. W**

Continues to provide practice in analytical writing, critical reading, and speaking, and to examine power and representation issues. Pre-requisite(s): Course 80C. Enrollment restricted to first-year college members who have not satisfied the C1 requirement. Enrollment limited to 22. (General Education Code(s): C1.) The Staff

**80F. Power and Representation: Collaborative Understandings (2 credits). F**

Examines issues of representation and power in a cultural perspective through readings, lecture/events, discussion, and collaborative learning responses in class, culminating in a group project resulting in a performance/film/exhibit or other creative expression. Enrollment is restricted to first-year Kresge students who have been placed in the Multilingual Curriculum. Enrollment limited to 25. The Staff

**80H. Reading Chinese Paintings.**

\*

Introduces significant currents in Chinese cultural history and their visual expression through close examination of selected paintings. Readings focus on a rich variety of primary sources in translation. Course intended for honors students by permission of instructor. Enrollment limited to 20. (General Education Code(s): T5-Humanities and Arts or Social Sciences, A.) R. Birnbaum

**80T. Power and Representation (Kresge Core Course for Transfer Students).** \*

Explores the intersections of investigations, interpretation, and persuasion, and hones strategies for writing and research. Explores relationships between individuals and their communities—communities as small as families and friends, colleges and cities; communities as large as nations and the world. Examines ways we constitute ourselves as individuals in relation to communities, focusing on representations of class, ethnicity, sexual orientation, gender, and race in several genres—critical theory, film, art, fiction, non-fiction, and theater. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to sophomore, junior, and senior college members. (General Education Code(s): T5-Humanities and Arts or Social Sciences, W.) The Staff

**90A. First Fifty: UCSC Playful Revolutions.** \*

Archival research, oral histories, and personal narratives form devised performance for the 50th year of UCSC. Research, visual theater, and performance studies approaches create a processional

performance of campus histories from ethnic struggle, to feminism, AIDS activism, and eco-consciousness. Enrollment is restricted to first-year, Challenge Program participants from Stevenson College, Merrill College, Porter College, and Kresge College. (General Education Code(s): PR-C.) M. Foley

**91F. Challenge Speakers Colloquium (2 credits).** F

Eight lectures, six by faculty about research problems in their disciplines. Students attend two dinners with the speakers; respond to research papers in each speaker's field; conduct a research interview with a professor; and investigate a research question. (Also offered as Porter College 91F. Students cannot receive credit for both courses.) Prerequisite(s): course 90A, or Merrill 90, or Porter 90A, or Stevenson 90. Enrollment restricted to college members. The Staff

**99. Tutorial. F,W,S**

A program of directed study arranged between a first-year or sophomore student and a Kresge faculty member. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**99F. Independent Study (2 credits).** F,W,S

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. May be repeated for credit. The Staff

**99G. Independent Study (3 credits).** F,W,S

A program of directed study arranged between a student and a Kresge faculty member. Students submit petition to sponsoring

agency. May be repeated for credit. The Staff

**UPPER-DIVISION COURSES**

**161. Permaculture and Whole Systems Design.** W

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. Priority given to Kresge College students. Enrollment limited to 23. May be repeated for credit. D. Shaw

**171. Kresge Challenge Seminar.** \*

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. Enrollment limited to 25. The Staff

**172. Collaborative Learning: The Great Turning.** \*

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. Enrollment restricted

to sophomores, juniors, and seniors.  
(General Education Code(s): PR-E.)  
D. Shaw

**173. Collaborative Learning:  
Sustainable Communities. \***

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. Enrollment is restricted to sophomores, juniors, and seniors.  
(General Education Code(s): PR-E.)  
D. Shaw

**174. Collaborative Learning:  
Permaculture Skills. \***

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. Enrollment is restricted to sophomores, juniors, and seniors.

(General Education Code(s): PR-E.)  
D. Shaw

**192. Directed Student Teaching.  
F,W,S**

Teaching of a lower-division seminar under Kresge faculty supervision. (See course 42.)  
Prerequisite(s): upper-division standing in Kresge, a proposal supported by a Kresge faculty member willing to supervise, and college approval. The Staff

**193. Field Study. F,W,S**

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.  
May be repeated for credit. The Staff

**194. Group Tutorial. F,W,S**

A program of independent study arranged between a group of students and a Kresge faculty member. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**195. Senior Thesis. F,W,S**

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. The Staff

**198. Independent Field Study.  
F,W,S**

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. May be repeated for credit. The Staff

**199. Tutorial. F,W,S**

A program of individual study arranged between an upper-division student and a Kresge faculty member. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# LANGUAGES AND APPLIED LINGUISTICS

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Department of Languages and Applied Linguistics  
218 Cowell College  
(831) 459-2054  
<http://language.ucsc.edu>

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## PROGRAM DESCRIPTION

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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 UCSC 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 Chinese, French, German, Hebrew, Italian, Japanese, Portuguese, 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 time, date, 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.

Currently the department also offers courses in applied linguistics that are taught in English and geared toward students interested in topics such as language and gender, second language teaching, discourse analysis, and intercultural communication.

The Department of Languages and Applied Linguistics houses the Spanish studies major, which enables students to learn in depth about the languages, histories and cultures of the Spanish-speaking world. Students of language 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, Italian, Japanese, Latin, Portuguese, Russian, and Spanish.

Everyone taking a language course is also encouraged to participate in foreign film series (e.g., Chinese, French, Italian, Japanese, Portuguese, Russian, Spanish), international music and dance festivals, and conferences on intercultural or international topics.

If a student wishes to study a specific language in depth, language studies is an ideal major that combines courses in language proficiency and culture with general and applied linguistics. Students may also use language courses for the following majors and minors that have a language requirement: classical studies, East Asian studies, German studies, global economics, health sciences, human biology, Italian studies, Jewish studies, Latin American and Latino studies, linguistics, and literature. The History Department encourages students of Asian, Latin American, European, and classical history to study a second language and provides a variety of opportunities to make use of language skills in their studies.

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 Office of International Education (OIE), through the UCSC Summer Abroad Program, or through affiliate programs around the globe. OIE 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, visit their web site, <http://oie.ucsc.edu>.

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## LANGUAGES AND APPLIED LINGUISTICS FACULTY AND PROFESSIONAL INTERESTS

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### APPLIED LINGUISTICS

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**Zsuzsanna Abrams**

Applied linguistics, language pedagogy, second language acquisition, intercultural communication, discourse analysis, computer-mediated communication

**Mark Amengual**

Bilingualism and language contact, acoustic phonetics, sociophonetics, second-language acquisition, language variation and change, Spanish and Romance linguistics

**Bryan Donaldson**

Word order variation in medieval French and medieval Occitan through the lens of information structure, discourse analysis, and sociolinguistics

**Shigeko Okamoto**

Sociolinguistics, discourse analysis, pragmatics, language and gender, foreign language pedagogy, Japanese linguistics

**Eve Zyzik**

Second language acquisition, heritage languages, Spanish linguistics, cognitive and usage-based theory, language pedagogy, content-based instruction

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### CHINESE

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**David Keenan**

Chinese language, fiction, and history

**Ting Ting Wu**

Sociolinguistics, Chinese novels, learning styles and teaching methodology for non-heritage speakers

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### FRENCH

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**Bryan Donaldson**

Word order variation in medieval French and medieval Occitan through the lens of information structure, discourse analysis, and sociolinguistics

**Greta Hutchison**

Foreign language pedagogy, second language acquisition, 20th-century French history and civilization, medieval French literature, 19th-century literature and art

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### GERMAN

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**Zsuzsanna Abrams**

Applied linguistics, language pedagogy, second language acquisition, intercultural communication, discourse analysis, computer-mediated communication

**Walter Campbell**

Language teaching, 18th- and 19th-century German literature, history of German

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### HEBREW

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**Tammi Rossman-Benjamin**

Hebrew language and culture, biblical Hebrew syntax and semantics, the Hebrew Bible, Jewish thought, psycholinguistics, second-language acquisition and bilingualism

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### ITALIAN

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**Giulia Centineo**

Italian culture and civilization; history of Italian language; Italian linguistics, syntax, and semantics; language pedagogy; Italian cinema; dubbing; Italian migrations

**Tonia Prencipe**

Technology and foreign language pedagogy; modern Italian culture, history, literature, and cinema; creative writing; promotion of Italian language and culture of K-12

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### JAPANESE

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**Mariko Bohn**

Sociolinguistics, language and gender, bilingualism, modern Japanese literature, language pedagogy

**Sakae Fujita**

Foreign language education, drama in education

**Shigeko Okamoto**

Sociolinguistics, discourse analysis, pragmatics, language and gender, foreign language pedagogy, Japanese linguistics

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### PORTUGUESE

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**Ana Maria Seara**

Portuguese language; literature, film, and music of Brazil and the Portuguese-speaking world; acquisition and teaching of foreign, second, and heritage languages

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### SPANISH AND SPANISH FOR SPANISH SPEAKERS

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**Mark Amengual**

Bilingualism and language contact; acoustic phonetics; sociophonetics; L2 acquisition; language variation and change; Spanish and Romance linguistics

**Byron Barahona**

Language acquisition and teaching methodology, Latin American literature and culture

**Carlos Calierno**

Intercultural communication and languages; Latin American culture; history of the conquest, music, art, and cinematography

**María Victoria González-Pagani**

Language teaching methodology; Spanish syntax; computer-assisted foreign language learning; Latin American cultural studies, especially women's contributions

**Marta Navarro**

Spanish language pedagogy for heritage speakers and non-native speakers; theatre; Mexican popular culture

**Ariel A. Pérez**

Language acquisition and teaching methodology,

computer-assisted language learning, teaching language for proficiency, oral proficiency assessment; Latin American current affairs

**Alvaro Romero-Marco**

Spanish literature of the 19th- and 20th-centuries; film, cultural studies

**Eve Zyzik**

Second language acquisition, heritage languages, Spanish linguistics, cognitive and usage-based theory, language pedagogy, content-based instruction

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## LANGUAGES COURSES

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### LOWER-DIVISION COURSES

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**80D. Italian Culture Through Cinema. S**

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. May be repeated for credit. (General Education Code(s): CC, T4-Humanities and Arts.) G. Centineo, The Staff

**99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**99F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### UPPER-DIVISION COURSES

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**199. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S**

Students submit petition to

sponsoring agency. May be repeated for credit. The Staff

### GRADUATE COURSES

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**210. Oral Communication in the U.S. Classroom: Strategies for International T.A.s (2 credits). F**

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. Enrollment restricted to international graduate students; language assessment administered by the Graduate Division. The Staff

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## APPLIED LINGUISTICS COURSES

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### LOWER-DIVISION COURSES

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**80. Introduction to Applied Linguistics. F**

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.. Enrollment limited to 40. (General Education Code(s): PE-H.) S. Okamoto, E. Zyzik, M. Amengual, B. Donaldson, Z. Abrams

**99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**99F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff  
Upper-Division Courses

**101. Second-Language Acquisition. W**

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(s): course 80

or linguistics 50. Enrollment limited to 40. The Staff, E. Zyzik, M. Amengual, B. Donaldson, Z. Abrams

**102. Bilingualism. S**

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(s): course 80 or linguistics 50. Enrollment limited to 40. The Staff, M. Amengual, E. Zyzik

**112. Language and Gender. W**

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.) S. Okamoto, The Staff

**113. Inter-Cultural Communication. \***

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.) Enrollment restricted to juniors and seniors. Enrollment limited to 25. (General Education Code(s): CC.) Z. Abrams, The Staff

**115. Language and Power. \***

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(s): course 80. Enrollment is restricted to sophomores, juniors, and seniors. Enrollment limited to 25. The Staff, Z. Abrams, S. Okamoto

**116. Discourse Analysis: Language Use and Context. \***

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(s): Linguistics 50 or by consent of the instructor. Enrollment restricted to juniors and seniors. B. Donaldson, The Staff

**135. Second Language Teaching. S**

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. Enrollment limited to 20. The Staff, Z. Abrams, E. Zyzik

**199. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**GRADUATE COURSES**

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**235. Second Language Teaching. S**

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.) Enrollment restricted to graduate students. Enrollment limited to 20. The Staff, Z. Abrams, E. Zyzik

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## PUNJABI COURSES

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### LOWER-DIVISION COURSES

#### **1A. Accelerated First-Year Punjabi. S**

Accelerated instruction in elementary Punjabi language. Students develop skills in speaking, reading, writing, and listening to real-life Punjabi. The accelerated pace allows for a rapid mastery of grammar and vocabulary; the course is designed for motivated beginning students. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# LANGUAGE STUDIES

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2015-16 General Catalog

Linguistics Department  
241 and 243 Stevenson College  
(831) 459-4988  
<http://linguistics.ucsc.edu>

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## PROGRAM DESCRIPTION

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Language studies is an interdisciplinary major offered by the Linguistics Department. It is designed to equip students with 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. It requires (1) acquisition of demonstrable competence in a language other than English, (2) grounding in linguistics, and (3) completion of a series of linguistics or cultural context courses related to the language. 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 career to obtain essential information about requirements.

Students interested in spending a portion of a year or a full year in study abroad should review the UCSC Programs Abroad web site at <http://ieo.ucsc.edu/programs-abroad/index.html>. 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 adviser.

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### PROGRAM LEARNING OUTCOMES

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The program learning outcomes for this major are the following: (1) ability to write clearly and articulately; (2) understanding of the general properties of language; (3) exposure to linguistic theory and linguistic investigation; (4) proficiency in a language other than English.

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### REQUIREMENTS OF THE LANGUAGE STUDIES MAJOR

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#### EARLY DECLARATION

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It is important that prospective students declare the major as early as possible so that they can complete the

language, linguistics, and context requirements within the allowed period of enrollment.

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 UCSC courses. Transfer students who have not made significant progress with the language requirements before entering UCSC may find it difficult to include a time abroad before completion of graduation requirements.

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### QUALIFICATION POLICY FOR THE LANGUAGE STUDIES MAJOR

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The Linguistics Department has adopted a major qualification policy for linguistics and 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.

In order to declare the linguistics or language studies major, a student must pass each of the gateway courses, Linguistics 50, Introduction to Linguistics, and Linguistics 53, Semantics 1, with a grade of C+ or better. 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 and 243). This letter should explain any extenuating circumstances that influenced their performance in the gateway courses. Within 15 days of receipt of the appeal, the department will notify the student, the student's college, and the Office of the Registrar of the decision.

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### COURSE REQUIREMENTS

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Language studies majors must satisfy course requirements in languages, linguistics, and cultural context.

## Language Studies

Language component: Language studies majors (in French, German, Italian, and Spanish) must achieve a level equivalent to six quarters in the language of concentration. One advanced language course after level 6 is also required. Majors in Chinese and Japanese must achieve a level equivalent to eight quarters of language study.

Linguistics component: The major requires four named foundation courses in linguistics:

- 50, Introduction to Linguistics
- 53, Semantics 1
- 101, Phonology 1
- 111, Syntactic Structures, or 112, Syntax I; and
- Two upper-division linguistics courses.

Cultural context or linguistics component: The major also requires five upper-division elective courses in linguistics or the cultural context of the language of concentration. Linguistics courses include any upper-division course offered by the Linguistics Department. Cultural context courses are to be selected from disciplines such as literature, history, and politics, subject to departmental approval.

Senior exit requirement: In their senior year, language studies majors must satisfy the senior exit requirement in one of two ways:

Option 1. Successful completion of a capstone course—an appropriate upper-division linguistics course. Students must have senior standing and must have completed Linguistics 53, Semantics I; 101, Phonology I; and 111, Syntactic Structures or 112, Syntax I. This course can be one of the two linguistics electives required for the major.

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 Linguistics 195, Senior Thesis, with the approval of the faculty adviser. 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.

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## DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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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 courses 101 and either 111 or 112.

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## REQUIREMENTS OF THE MINOR

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The minor requires completion of two years (six quarters) of language study (or demonstration of an equivalent level of ability) and eight additional linguistics and cultural context courses as follows:

- 50, Introduction to Linguistics
- 101, Phonology I
- 111, Syntactic Structures, or 112, Syntax I
- Two upper-division linguistics courses
- Three electives in linguistics or in the cultural context of the language of concentration to be selected from disciplines such as literature, history, and politics, subject to departmental approval. One of the courses taken must have a prerequisite of Level 6 in the student's designated language.

There is no senior exit requirement for the minor.

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## HONORS

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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 and narrative evaluations 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.

Revised: 09/01/15

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# LATIN

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2015-16 General Catalog

History Department

201 Humanities

(831) 459-2982

<http://history.ucsc.edu/>

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## PROGRAM DESCRIPTION

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The History Department offers instruction in elementary Latin. It consists of a two-course sequence, Latin 1 and Latin 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.

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### CAMPUS LANGUAGE LABORATORIES AND PLACEMENT EXAMS

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No placement exam is required for entry into Latin 1. Contact the History Department for more information about these topics.

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## LATIN FACULTY AND PROFESSIONAL INTERESTS

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### **Karen Bassi (Literature)**

Greek and Latin literatures; gender; literary and cultural theory; pre- and early modern studies; tragedy; historiography; visual and performance studies; death studies

### **Mary-Kay Gamel (Literature), Emerita**

### **Gildas Hamel (History), Emeritus**

### **Charles W. Hedrick Jr. (History)**

Greek and Roman history

### **John P. Lynch (Literature), Emeritus**

### **Jennifer Lynn (History)**

Later Roman Republic and Principate; Homeric epic; Hellenistic and Augustan poetry; the lives of women in the ancient world

### **Daniel Selden (Literature)**

Afroasiatic languages and literatures, Greek and Latin, Hellenistic culture, the classical tradition, history of criticism, literary theory

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## LATIN COURSES

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### LOWER-DIVISION COURSES

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#### **1. Elementary Latin. F**

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. The Staff

#### **2. Elementary Latin. W**

Instruction in Latin grammar, using a modern Latin method, designed to prepare for the study of classical literature. Prerequisite(s): course 1. The Staff

#### **99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. The Staff

#### **99F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. The Staff

Revised: 09/01/15

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# LATIN AMERICAN AND LATINO STUDIES

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2015-16 General Catalog

32 Merrill College

(831) 459-4284

<http://lals.ucsc.edu>

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## PROGRAM DESCRIPTION

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The Latin American and Latino Studies (LALS) Department prepares students for bilingual and multicultural participation in a rapidly changing and globalized world. As currently established at UCSC, this inherently interdisciplinary field draws from sociology, history, anthropology, political science, media studies, communications, cultural studies, ethnic studies, economics, environmental studies, and literature. LALS investigates the historical, economic, social, and cultural processes that are shaping and transforming the Americas region. By viewing societies as interrelated—specifically U.S. Latino/a communities and Latin American/Caribbean communities—LALS analyzes how local, regional, global, and transnational dimensions affect histories, politics, and cultures.

LALS courses support four department areas of emphasis: (1) transnationalisms, migrations, and displacement; (2) intersectionality, identities, and inequalities; (3) collective action, social movements, and social change; and (4) culture, power, and knowledge. Our courses deal with several key subjects and transnational processes corresponding to the department areas, including: immigration and transnational migration; gender, critical race, sexuality, youth, and ethnic studies; social movements and activism; human rights; plural forms of cultural expression and cultural politics; ongoing political and economic restructuring in Latin America; and the challenges of political and economic empowerment for U.S. Latino/a communities. Through these courses, students learn to formulate thoughtful, critical and clear arguments, strengthen writing and reading skills, develop research skills, and become effective bilingual or multilingual communicators.

In addition to academic knowledge, LALS supports and encourages students to pursue opportunities to acquire practical, real-world skills. Through prospective internships and field-study experiences, students can acquire useful, pre-professional skills in key areas, such as community development/advocacy, public policy, education, legal services, and research/writing.

Graduates of the LALS major have forged careers in a wide variety of fields, including teaching, community organizing, community and government service, journalism and the media, environmental science, global economics, health care, legal services, library science, music, publishing, and research. Many have gone on to pursue advanced degrees in the U.S. or abroad in fields such as anthropology, bilingual education, media, communications, cultural studies, ecology, economics, geography, history, law, literature, educational counseling, public health, and sociology.

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## PROGRAM LEARNING OBJECTIVES

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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 key skills, such as quantitative skills, conduct statistical analysis, gather/obtain research data, finding/using primary sources, qualitative research, 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 English, Spanish, and/or Portuguese.

**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 working with community and civic organizations.

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## DECLARATION OF THE MAJOR

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Students need to complete LALS 1, Introduction to Latin American and Latino Studies, and one additional lower-division Latin American and Latino Studies course prior to declaring the major. A junior transfer student may petition the department to satisfy the lower-division requirements with equivalent courses from a qualified institution. These courses must appear on the UCSC Transfer Credit Summary. See the LALS department for more information.

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## REQUIREMENTS OF THE MAJOR

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A minimum of 12 courses is required for the major.

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### TWO LOWER-DIVISION LALS COURSES

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All students are required to take LALS 1, Introduction to Latin American and Latino Studies, and one additional lower-division Latin American and Latino studies course. These courses are normally taken during the student's first year. In addition, all majors must complete 10 upper-division courses, including three required core courses, (no substitutions).

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### THREE UPPER-DIVISION CORE COURSES

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100 Concepts and Theories in Latin American and Latina/o Studies

100A Social Science Analytics

100B Theory and Analysis in the Humanities

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### SEVEN UPPER-DIVISION COURSES

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These courses must fulfill the following requirements:

- Three LALS courses from one area of emphasis (described below)
- Three additional LALS upper-division courses
- One LALS course satisfying the senior comprehensive requirement (described below)
- Two of these upper-division courses must be taken in Spanish or Portuguese\*

The four areas of emphasis for upper-division courses are:

- Transnationalisms, Migrations, and Displacement
- Intersectionality, Identities, and Inequalities
- Collective Action, Social Movements, and Social Change
- Culture, Power, and Knowledge

\*Upper-division courses in Portuguese are currently not taught at UCSC and must be taken elsewhere.

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### SENIOR COMPREHENSIVE REQUIREMENT

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Every major must complete a senior exit requirement in order to graduate. The preparation and completion of this requirement is structured into the senior year.

### One upper-division course chosen from the following four options.

1. Passing a Latin American and Latino Studies senior seminar (194 series). In these courses, students must write at least 30 pages cumulatively during the quarter. The final paper is based on independent scholarly research, demonstrates advanced skills in critical analysis, and has undergone revisions. Senior standing and completion of LALS 100A and 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 adviser 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 adviser while enrolled in an independent study (done by petition to LALS, and with the approval of the faculty adviser). If the thesis option is selected by a combined major, it should be 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.
4. A senior project, which can be either a creative project or a community-action project. Creative projects include web site 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, short, written analysis has to be 10 pages minimum.

**Note:** Some combined majors have fewer options for exit requirements (see below).

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### LANGUAGE REQUIREMENTS

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All Latin American and Latino studies majors are expected to learn to speak, read, and write Spanish or Portuguese and to make use of these skills on a regular basis in their upper-division academic work.

## Latin American and Latino Studies

Majors must take at least two upper-division courses taught in Spanish or Portuguese.\* Before taking upper-division coursework taught in the language, students must demonstrate proficiency in Spanish equivalent to the completion of Spanish 6 or Spanish for Heritage Speakers 6. Students who wish to pursue Portuguese may take the Portuguese 1A/1B or 60A/60B series. Students who have achieved fluency in Spanish or Portuguese through life experience may be exempt from this recommended preparatory coursework after demonstration of their proficiency. In addition to Latin American and Latino studies and affiliated department course offerings, the required two upper-division courses taught in Spanish or Portuguese\* may be fulfilled through study abroad with approval by the LALS Department. Students may also pursue internship or field study opportunities to satisfy one of the two required upper-division courses taught in Spanish or Portuguese; however, at least one of the two courses must be fulfilled in a classroom setting.

\*Upper-division courses in Portuguese are currently not taught at UCSC and must be taken elsewhere

### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in Latin American and Latino studies and the combined majors with politics, and sociology are met by completing courses 100A and 100B.

### COURSE SUBSTITUTIONS AND TRANSFER CREDITS

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A maximum of two courses are allowed for substitution of LALS major requirements. However, there are no substitutions allowed for LALS 01, 100, 100A and 100B. Courses from other institutions must appear in the student record on the UCSC Transfer Credit Summary. Students must consult with the student adviser regarding requests for course substitutions.

### FIELD-STUDY AND INTERNSHIP OPPORTUNITIES

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All majors are encouraged to undertake either a field study in Latin America, the Caribbean, a Latino/a community in the U.S., or formal academic study abroad through the Education Abroad Program (EAP). These paths are the best ways to improve language skills, to explore the nature and direction of specific academic and career interests in relation to Latin American and Latino studies, and to 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 the Latin American and Latino Studies Department web site 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 Latin American and Latino Studies Department office, 32 Merrill.

### STUDY ABROAD

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Students may study abroad through the Education Abroad Program (EAP), through UC Summer & Quarter Abroad Programs, or through independent programs. EAP offers opportunities for students to study in Buenos Aires, Argentina; Mexico City, Mexico; Santiago, Chile; Rio de Janeiro, Brazil; and Madrid, Córdoba, Granada, and Barcelona in Spain. In addition to language and culture and university immersion programs, EAP also offers a Field Research Program in Mexico, which is an experiential program geared toward juniors and seniors who want to explore the "real" Mexico outside the classroom and at the same time receive undergraduate research training. The program has research sites in states such as Jalisco, Yucatán, Oaxaca, and Michoacán (final site choice depends on the research topic). Application deadlines are generally about one year in advance of the program, so students should visit the UCSC International Education Office early to plan for study abroad and to begin the application process. The department will consider by petition the approval of courses taken abroad, whether through EAP or through independent programs, that cover topics appropriate to the LALS curriculum for upper-division credit toward the major. All credit for EAP classes is fully incorporated into students' UCSC transcripts; students receive transfer credit for independent study abroad programs. Financial aid applies to all EAP programs and takes into account airfare and living costs in addition to tuition and fees; financial aid is not available for students who study abroad independently. Before departure, student should present an academic plan for courses abroad to the department advisor for review. Credit for up to three EAP courses can be applied toward the major. (A maximum of three courses of field study and EAP

combined can be applied toward the major requirements.)

### LATIN AMERICAN AND LATINO STUDIES MAJOR PLANNERS

The following are two recommended academic plans for undertaking basic preparation for the Latin American and Latino studies major. Plan One is a guideline for students who commit to the major early in their academic career. Plan Two is for transfer students.

<b>Plan One—Frosh</b>			
<b>Year</b>	<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
1st (frsh)	SPAN 1	SPAN 2	SPAN 3
	LALS 1	LALS lower-division	LALS lower-division
2nd (soph)	SPAN 4 or SPHS 4	SPAN 5 or SPHS 5	SPAN 6 or SPHS 6
	LALS 100	LALS 100A	LALS 100B
3rd (jr)	LALS upper-division course	LALS upper-division course	LALS upper-division course
4th (sr)	LALS upper-division course	LALS upper-division course	LALS 194 (Senior-Exit Requirement)

<b>Plan Two—Junior Transfers</b>			
<b>Year</b>	<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
3rd (jr)	SPAN 4 or SPHS 4	SPAN 5 or SPHS 5	SPAN 6 or SPHS 6
	LALS 100	LALS 100A	LALS 100B
	LALS 1	LALS lower-division	LALS upper-division course
4th (sr)	LALS upper-division course	LALS upper-division course	LALS upper-division course
	LALS upper-division course	LALS upper-division course	LALS 194 (Senior-Exit Requirement)

### COMBINED MAJORS

The combined major options, requiring fewer courses than a double major, are established with the politics and sociology departments.

#### LATIN AMERICAN AND LATINO STUDIES/POLITICS

Students are required to take a total of 13 courses and to satisfy a senior comprehensive requirement. For the combined major in Latin American and Latino studies/politics, students complete two lower-division course requirements, LALS 1 and one course from Politics 1-79. Transfer students may petition to substitute LALS 1 or one course from Politics 1-79 with appropriate coursework from another institution. The 11 upper-division courses include three core course from LALS (LALS 100, 100A and 100B), one from Politics (140C) and seven upper-division electives, five from politics (three of which must be politics core courses from the 105, 120, 140, and 160 series) and two from LALS (one must be taught in Spanish or Portuguese\*).

#### LATIN AMERICAN AND LATINO STUDIES/SOCIOLOGY

Students are required to take a total of 13 courses and to satisfy a senior comprehensive requirement. There are three lower-division course requirements, two from the Sociology Department and one from Latin American and Latino Studies Department. The lower-division LALS course must be LALS 1; transfer students may petition to replace the LALS 1 with an appropriate course from another institution. Upper-division requirements include six core courses: LALS 100, 100A, 100B; Sociology 103B, 105A, and 105B; and four additional elective courses, two from sociology and two from Latin American and Latino studies. At least one of the Latin American and Latino studies upper-division courses must be taught in Spanish or Portuguese.\* Up to three relevant courses taken through study abroad programs from which credits are transferable to UCSC may be credited toward the major, when the content is deemed appropriate by the faculty advisers of both Sociology and Latin American and Latino studies. Students can satisfy the comprehensive requirement in one of three ways: (1) writing a senior thesis, (2) passing an appropriate LALS Senior Seminar (194 series), or (3) completing two additional sociology upper-division courses in the area of Inequality and Social Change (refer to the sociology undergraduate adviser for the specific list of courses). If the thesis option is selected, it should be 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. See Sociology program statement on admission to the LALS/Sociology major.

\*Upper-division courses in Portuguese are currently not taught at UCSC and must be taken elsewhere.

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## HONORS IN THE MAJOR

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The LALS faculty considers awarding honors in the major based on overall student academic performance in courses that count towards 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. For combined majors, student work must be considered to be honors-level in both departments; the LALS faculty cannot award honors in the major unless the other department also confers honors.

LALS also awards honors for the thesis, creative or community action projects, or student taught seminars, by the recommendation of the faculty adviser. Note that a thesis and a creative/community project are the only senior exit requirement options that qualify for this distinct honors designation. 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.

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## MINOR REQUIREMENTS

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The minor in Latin American and Latino studies consists of seven courses, including two LALS lower-division courses and five upper-division courses (including LALS 100 or LALS 100A or 100B and any other four upper-division courses that count towards the major). Knowledge of Spanish and/or Portuguese is highly recommended, but not required for the minor.

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## GRADUATE STUDIES

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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.

1. **Transnational Migrations.** 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.
2. **Social 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.
3. **Cultural Politics and Cultural Flows.** 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.
4. **Collective Action and Social Movements.** 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.

### COURSEWORK REQUIREMENTS

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 four regular graduate courses offered in other departments and the Graduate Advisor will determine whether these courses count for the LALS program requirements. Before advancement to candidacy, a full-time course load is two or three courses at the graduate seminar level. The following are the course requirements:

LALS 200 Bridging Latin American and Latino Studies

LALS 200A Politics and Society

LALS 200B Culture and Society

Two methodology courses (taught in LALS or in a disciplinary department)

Seven additional 5-unit courses leading to the definition of two areas of concentration, taken in consultation with the advisor

LALS 201 two-unit pedagogy course with the Graduate Director (pending approval)

In addition, students may enroll in LALS 291 (a two-unit advising course; pending approval) each quarter until advanced to candidacy as per their advisor's instructions. Students are encouraged to enroll in a grant-writing course, which may be taken outside the department. If students take the Graduate Summer Language course(s), they will not count as part of the seven additional courses. If a student enters with a Master's Degree from another university, s/he may petition to the Graduate Director to request that some of the graduate courses fulfill LALS course requirements.

### LANGUAGE REQUIREMENT

The program requires significant reading, writing and speaking abilities in both English and Spanish. To meet our secondary language requirement (Spanish, Portuguese, or indigenous language of the Américas) our students, irrespective of native language, must prove that they are able to critically engage in/with research and scholarship in the secondary language. The baseline for meeting this requirement is advanced, scholarly reading comprehension and translation, demonstrated in one of three ways: successfully passing a departmental Spanish-to-English translation examination; passing a UCSC graduate course conducted in Spanish or Portuguese, either a 5-credit graduate seminar in LALS or another UCSC department offered in the secondary language during the academic year or a UCSC literature summer research language course; or successfully completing a department approved summer language immersion program with a rigorous, scholarly focus at another academic institution in the U.S. or abroad. 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.

### THE QUALIFYING EXAMINATION PROCESS

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 principal faculty members—one LALS Core faculty member and one LALS Graduate Program Affiliate faculty member, one of whom chairs the committee—and one tenured faculty from outside the LALS department. The qualifying examination committee must be approved in advance by the Graduate Division. Students should take their examinations by spring of the third 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, social inequalities, cultural flows and

cultural politics, or collective action and social movements. 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.

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.

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

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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.

## DESIGNATED EMPHASIS IN LATIN AMERICAN AND LATINO STUDIES

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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 chairs 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 at: <http://lals.ucsc.edu>.

The following are required for the designated emphasis:

**Committee Composition.** The student must have a designated graduate adviser from among the Latin American and Latino studies core, participating, or affiliated faculty. This adviser will be in addition to the graduate adviser from the student's home department. The Latin American and Latino studies adviser 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 LALS 200 and LALS 297. The remainder can be selected from appropriate graduate offerings of any UCSC department, as long as they are taught by core, participating, or affiliated Latin American and Latino studies faculty.

**Courses.** Graduate coursework in Latin American and Latino studies is available both in the Latin American and Latino Studies Department and in other UCSC departments.

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## LATIN AMERICAN AND LATINO STUDIES FACULTY AND PROFESSIONAL INTERESTS

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### CORE FACULTY

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**Gabriela Arredondo, Associate Professor of Latin American and Latino Studies**

Latina/o studies; Chicana/o history; U.S. immigration histories; U.S. social and cultural history; critical race and ethnicity theories; Chicana and Mexicana feminisms; “borderlands” studies; history of modern Mexico

**John G. Borrego, Professor Emeritus of Latin American and Latino Studies**

**Sylvanna Falcón, Assistant Professor of Latin American and Latino Studies**

Human rights, transitional justice, racism/antiracism, globalization, transnational feminism, Latin America (Peru)

**Adrián Félix, Assistant Professor of Latin American and Latino Studies**

International migration; Mexico-U.S. migration; migrant transnationalism; racial/ethnic politics and identity; politics of citizenship; Latino politics

**Jonathan Fox, Professor Emeritus of Latin American and Latino Studies**

**Rosa-Linda Fregoso, Professor Emerita of Latin American and Latino Studies**

**Walter L. Goldfrank, Professor Emeritus of Latin American and Latino Studies and Sociology**

**Fernando Leiva, Associate Professor of Latin American and Latino Studies**

Political economy of Latin American capitalism; critical cultural political economy; social movements; state-society articulations under neoliberalism and post-neoliberalism; social network analysis

**Lourdes Martínez-Echazábal, Professor of Latin American and Latino Studies**

Latin American and Caribbean literatures; Afro-Latin American literatures, cultures, and societies; found[n]ational narratives; Brazilian literature; literatures of Cuba and the Cuban diaspora, cinema and social change in Cuba; critical race theory, queer literature and cinema in Latin America

**Hector Perla, Jr., Assistant Professor of Latin American and Latino Studies**

International relations; Latin American studies; Latino politics; 21st-century left in Central America; U.S. foreign policy; social and revolutionary movements; asymmetric conflicts; political psychology; transnational political mobilization

**Catherine Ramirez, Associate Professor of Latin American and Latino Studies**

United States cultural history, with a focus on immigration and assimilation; theories of citizenship; Latino literature; comparative ethnic studies; feminist and gender studies; cultural studies and the study of visual culture

**Cecilia M. Rivas, Assistant Professor of Latin American and Latino Studies**

Transnationalism; media and communication (Internet, newspapers); migration; globalization; race, ethnicity, and gender; bilingualism; consumption; El Salvador, Central America, Southern Mexico

**Jessica K. Taft, Assistant Professor of Latin American and Latino Studies**

Youth activism; childhood and youth studies; social movements; participatory democracy; girls studies; Latin American radicalisms; feminist theory; qualitative and participatory research methods

**Patricia Zavella, Professor of Latin American and Latino Studies**

Transnational migration by Mexicans, poverty, family, sexuality, labor, social networks, feminist studies, Chicana/o-Latina/o studies, ethnographic research methods

### PARTICIPATING FACULTY

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**Mark D. Anderson, Associate Professor of Anthropology**

Racial formation, diaspora, nationalism, transnationalism, indigeneity, consumption, Central America, Honduras, Latin America, African diaspora

**Jeffrey T. Bury, Associate Professor of Environmental Studies**

Political ecology; sustainable development; Latin American studies; international relations; institutional dimensions of natural resource conservation in the global south

**Pedro G. Castillo, Associate Professor Emeritus of History**

**Cynthia Cruz, Assistant Professor of Education**

Feminist ethnography; community-based learning; decolonial pedagogies; LGBTQ street youth; women of color thought; cultural studies and education

**Kent H. Eaton, Professor of Politics**

Comparative politics, Latin America international relations, political economy, public policy, political institutions

**Lisbeth Haas, Professor of History, Professor of Feminist Studies**

U.S.-Mexico borderlands, Chicano and Native American history; visual culture in the colonial Americas; the U.S. West and California; historical memory, theory, and historical methodology

**Norma Klahn, Professor of Literature**

Latin American literary and cultural studies (specialization: Mexico); Chicano/Latino literature and culture from a cross-border perspective; modernity/postmodernity; poetics and politics; genre theory (novel, poetry, autobiography); critical theory (i.e., border, ethnic, feminist, transnational/global)

**Flora Lu, Associate Professor of Environmental Studies**

Ecological anthropology, human behavioral ecology, Amazon rainforest, indigenous peoples, conservation, Ecuador, culture change, market integration, indigenous resource management, political ecology, environmental justice

**Eduardo Mosqueda, Associate Professor of Education**

Mathematics education of English learners; large-scale dataset quantitative analysis; urban education issues

**Olga Nájera-Ramírez, Professor of Anthropology**

Folklore theory, ritual, festival, dance, greater Mexican culture, history and folklore, transnationalism, identity; expressive culture, ethnomusicology, bilingual communication, gender, history, and culture of Latin America, the U.S., and Mexico

**Marcia Ochoa, Associate Professor of Feminist Studies**

Gender and sexuality, race and ethnicity, Latina/o studies, media and cultural studies, ethnography of media, feminism, queer theory, multimedia production, Latin American studies—Colombia and Venezuela, political philosophy, geography

**Juan Poblete, Professor of Literature**

Latin(o) American literatures; transnational/global cultures (literature, radio, film); Latin(o) American cultural studies; 19th-century studies; the history of reading practices

**Renya K. Ramirez, Associate Professor of Anthropology**

Native American studies, Indian identity, Native Americans and anthropology, urban Indians, Native American women, cultural citizenship, expressive culture, and anti-racist education

**B. Ruby Rich, Professor of Social Documentation and Film and Digital Media**

Documentary film and video, post-9/11 culture, new queer cinema, feminist film history, Latin American and Latin/a cinema, U.S. independent film and video, the essay film, the politics of film festival proliferation and the marketing of foreign films in the U.S.

**Barbara Rogoff, Professor of Psychology**

Human development in sociocultural activity; informal and formal arrangements for learning; adult/child and peer communication in families and schools in diverse cultural communities (especially in Guatemala, Mexico, and the U.S.); learning through observation and collaboration

**Felicity Amaya Schaeffer, Associate Professor of Feminist Studies**

Transnational feminism, migration, Latin American/Latino studies, Chicana/o studies, Internet, technology and the body, sexuality, gender and globalization

**Helen Shapiro, Associate Professor of Sociology**

Political economy, Latin American economic history and development (with an emphasis on Brazil), industrial policy, the auto industry, the state and transnational corporations

**AFFILIATED FACULTY**

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**Jorge Aladro Font, Professor of Spanish Literature**

Spanish mysticism, theory and historical developments of imagery in the Middle Ages to the baroque period, Renaissance and baroque Hispanic literature, Italian ideas in the Spanish Renaissance, Cervantes

**Chelsea Blackmore, Assistant Professor of Anthropology**

Pre-Columbian archaeology (Mesoamerican focus), identity formation, complex societies, class and state formation, gender, feminist/queer theory

**Carolyn Dean, Professor of History of Art and Visual Culture**

Cultural histories of the native Americas and colonial Latin America

**Maria Elena Diaz, Associate Professor of History**

Atlantic world, Colonial Latin America and the Caribbean, Cuba; social and cultural, global and local histories; colonialism, slavery and freedom, race/ethnicity, gender and class; legal, political, popular, and religious culture

**Robert W. Fairlie, Associate Professor of Economics**

Labor economics, entrepreneurship, education, applied econometrics

**Dana Frank, Professor of History**

Late 19th- and 20th-century U.S. social history, including women's, labor, and working-class history, race and ethnicity; modern Honduras; U.S. history in transnational perspective

**Gregory S. Gilbert, Professor of Environmental Studies**

Disease ecology, forest ecology, tropical ecology, biological invasions, conservation biology, applied evolutionary ecology

**María Victoria González-Pagani, Lecturer in Spanish Language**

Language teaching methodology; Spanish syntax; computer-assisted foreign language learning; Latin American cultural studies, especially women's contributions

**Shelly Grabe, Associate Professor of Psychology**

Structural and individual components of women's rights violations and social justice in the context of globalization; partnership with grassroots women's organizations; embodied oppression

**Miriam Greenberg, Associate Professor of Sociology**

Urban sociology, media studies, cultural studies, political economy, globalization, and urban political ecology

**Kirsten Silva Gruesz, Professor of Literature**

Chicano/Latino literatures and cultures, Comparative Americas studies, language ideologies and bilingualism in literature

**Daniel Guevara, Associate Professor of Philosophy**

Kant, moral philosophy, moral psychology, environmental ethics, history of modern philosophy

**Craig Haney, Professor of Psychology**

Applications of social psychological principles to legal settings, assessment of the psychological effects of living and working in institutional environments, social contextual origins of violence, development of alternative legal and institutional forms

**Karen D. Holl, Pepper-Giberson Professor, Environmental Studies**

Restoration ecology, conservation biology, landscape ecology

**Regina D. Langhout, Associate Professor of Psychology**

School-community-university collaboration; how schooling and neighborhood experiences are informed by social class, race, and gender; participatory action research

**John Leños, Assistant Professor of Social Documentation**

Documentary animation, social documentation, social art practice, community arts, Chicana/o art and culture, new media, critical media studies, cultural studies, documentary photography, installation art, public art and interventionist art practice

**Deborah Letourneau, Professor of Environmental Studies**

Agroecology, tropical biology, insect-plant interactions, biological conservation for ecosystem services, biological processes as an alternative to pesticides, environmental risks of genetically engineered organisms, redwood forest community ecology

**Daniel T. Linger, Professor Emeritus of Anthropology**

**Paul M. Lubeck, Professor Emeritus of Sociology**

**Andrew Salvador Mathews, Associate Professor of Anthropology**

Environmental anthropology, science and technology studies, conservation and development, climate change, environmental history, Mexico, Latin America, Italy

**Judit Moschkovich, Professor of Mathematics Education**

Mathematical thinking and learning; student conceptions of functions; mathematical discourse; everyday mathematical practices; bilingual mathematics learners

**Matthew D. O'Hara, Associate Professor of History**

Modern Latin America and Mexico; late colonial Latin America; religion, spirituality, and ritual; urban history; race, ethnicity, and identity; political culture

**Lucinda Pease-Alvarez, Professor of Education**

Language and literacy development, language-minority education, bilingualism, informal learning, teachers as policy makers

**Daniela Sandler, Assistant Professor of History of Art and Visual Culture**

Modern and contemporary architecture and urbanism; visual and cultural studies; social inequality in space; architectural preservation; history and memory in the built environment; architecture and visual culture in Latin America and Europe, with foci on Brazil and Germany

**Ana Maria Seara, Lecturer, Portuguese Language**

Portuguese language; literature, film, and music of Brazil and the Portuguese-speaking world; acquisition and teaching of foreign, second, and heritage languages

**Dana Y. Takagi, Professor of Sociology**

Social inequality and identity, research methods, race relations, nationalism and social movements

**Kip Telléz, Professor of Education**

Preparation of teachers for linguistic and cultural diversity, second language learning, studies of the school curriculum, educational assessment

**Gustavo Vazquez, Associate Professor of Film and Digital Media**

Film and video production, documentary and experimental cross-cultural experiences in film

**Rasmus Winther, Associate Professor of Philosophy**

Philosophy of science, philosophy of biology, philosophy of mind, pragmatism, Latin American philosophy, continental philosophy, philosophy of multiculturalism, post-colonial theory, feminism, ontology, evolutionary theory, cognitive science

**Karen Tei Yamashita, Professor of Literature (Creative Writing)**

History and anthropology of Japanese immigration to Brazil, Asian American literature, modern fiction, playwriting

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## LATIN AMERICAN AND LATINO STUDIES COURSES

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### LOWER-DIVISION COURSES

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**1. Introduction to Latin American and Latino Studies. F,W**

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. (General Education Code(s): ER, IS, E.) F. Leiva

**20. Latino Politics. F**

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. (General Education Code(s): ER.) A. Felix

**30. Social Movements in Latin America. \***

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. (Formerly course 80B.) Enrollment limited to 60. (General Education Code(s): CC, T3-Social Sciences, E.) H. Perla

**40. Latinos, Work, and Organizing. \***

Students learn about the role of Latinos in different forms of U.S. organized labor (including, but not limited to, traditional unions). Focus is on organizing in several low-wage and immigrant-dense industries. (Formerly course 80K.) (General Education Code(s): ER, T3-Social Sciences, E.) The Staff

**42. Student-Directed Seminar.**

Seminar taught by upper-division student under faculty supervision. Requires prior approval by Latin American and Latino Studies Department and two quarters (fall, winter) of supervised preparation

prior to teaching in spring quarter. (See course 192). The Staff

**45. Race, Class, and Gender. \***

Examines the economic, social, political, and cultural experience of communities of color (Latinas/os, African Americans, Asian Americans, and Native Americans) and women in the U.S., through a sociological perspective. Using quantitative and qualitative methods, the relationship among individual actions, social institutions, societal forces, and social change are analyzed. (Formerly course 80G.) (General Education Code(s): ER, T3-Social Sciences, E.) The Staff

**50. Transnational Feminist Organizing in the Americas. \***

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. (Formerly course 80W.) (General Education Code(s): CC.) S. Falcon

**60. Latin American Childhoods.**

**S**  
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. (General Education Code(s): CC.) J. Taft

**70. Cinema and Social Change in Cuba. F**

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. (General Education Code(s): IM.) L. Martinez-Echazabal

**80D. Political Change in Mexico. \***

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. (General Education Code(s): CC, T3-Social Sciences, E.) A. Felix

**80E. Latin American Philosophy. \***

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. (Also offered as Philosophy 80E. Students cannot receive credit for both courses.) (General Education Code(s): T4-Humanities and Arts, E.) R. Winther

**80F. Latinos in the U.S.: A Comparative Perspective. \***

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. (General Education Code(s): ER, T3-Social Sciences, E.) A. Felix

**80H. Comparative Latina/o Histories. S**

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. (General

Education Code(s): CC, T3-Social Sciences, E.) G. Arredondo

**80I. Gender and Global Cinema. S**

Applies critical and historical approaches to the study of gender in global cinema. Introduces students to different aesthetic and cross-cultural approaches to representing gender in contemporary film. Focuses on films, documentaries, and video works from the Americas as well as from other regions of the global South. Enrollment limited to 80. (General Education Code(s): CC, T3-Social Sciences, E.) R. Fregoso

**80J. Race, Nation, and War. W**

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. Enrollment limited to 80. (General Education Code(s): ER, T3-Social Sciences, E.) C. Rivas

**80P. Energy, Society, and Environment in Latin America. \***

From petroleum extraction to hydroelectric power to ethanol production, Latin America is an important provider of the world's energy. Course examines the implications of this process for economic growth, climate change, environmental degradation, social inequality, and poverty. (Formerly Energy, Society, and Ecology in Latin America.) Enrollment limited to 80. (General Education Code(s): PE-E, T3-Social Sciences, E.) The Staff

**80Q. Musica Latina: Music of Latin America and the Caribbean. \***

Surveys various musical forms and styles that have developed in Latin America and Latino communities in the U.S. Discusses concept of hybridity and grapples with this as a central issue in the evolution of Latin American/Latino music. Addresses migration of music, which not only contributes to its distribution but also to the evolution of musical practices of forms, styles and genres across borders. (Formerly Musica Latina.) (General Education Code(s): CC, T3-Social Sciences, E.) The Staff

**80R. Organizing Across the Americas. \***

Analyzes the range of theory and practice that emerged from and shaped significant social movements during the rise and fall of United States hegemony. Focuses on social struggles and revolutions in five distinct locations across the Americas: the United States (United Farm Workers--UFW), Cuba (Movimiento 26 de Julio--M26J), Nicaragua (Frente Sandinista de Liberacion Nacional--F.S.L.N.), Mexico (Zapatistas), and Brazil (Movimento dos Trabalhadores Rurais Sem Terra--MST). Enrollment limited to 80. (General Education Code(s): T3-Social Sciences, E.) J. Borrego, The Staff

**80S. Sexualities and Genders in Latin American and Latina/o Studies. \***

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. Enrollment limited to 80. (General Education Code(s): CC, T3-Social Sciences, E.) The Staff

**80X. Central American Peoples and Cultures. W**

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. Enrollment limited to 80. (General Education Code(s): CC, T5-Humanities and Arts or Social Sciences, E.) C. Rivas

**81A. Mexican Folklorico Dance (2 credits). \***

Provides instruction in the aesthetic, cultural, and historical dimensions of Mexican folklorico dance. Students taught choreographed dances from various regions of Mexico and also learn dance techniques (tecnic) and stage make-up application. Additional workshops and lectures offered to supplement class. Open to all students; no previous experience required. (Also offered as Anthropology 81A. Students cannot receive credit for both courses.) May be repeated for credit. (General Education Code(s): PR-C, A.) O. Najera Ramirez

**81B. Mexican Folklorico Dance (2 credits). \***

Second course in series. Provides instruction in the aesthetic, cultural, and historical dimensions of Mexican folklorico dance. (Also offered as Anthropology 81B. Students cannot receive credit for both courses.) May be repeated for credit. (General Education Code(s): PR-C, A.) O. Najera Ramirez

**81C. Mexican Folklorico Dance (2 credits). \***

Third course in series. Provides instruction in the aesthetic, cultural, and historical dimensions of Mexican folklorico dance. (Also offered as Anthropology 81C. Students cannot receive credit for both courses.) Prerequisite(s): course 81A or 81B. May be repeated for credit. (General Education Code(s): PR-C, A.) O. Najera Ramirez

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UPPER-DIVISION COURSES

**100. Concepts and Theories Latin American and Latina/o Studies. F**

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. (Formerly course 10, Bridging Latin American and Latina/o Studies) Enrollment restricted to sophomores, juniors, and seniors. (General Education Code(s): ER, E.) G. Arredondo

**100A. Social Science Analytics. W**

Compares diverse analytical strategies and builds practical research skills in the field of Latin American and Latino studies. (Formerly Politics and Society: Concepts and Methods.) Two-credit course 100L writing lab highly recommended. Prerequisite(s): course 100 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to sophomore, junior, and senior Latin

## Latin American and Latino Studies

American and Latino studies majors, minors, and combined majors or by permission. (General Education Code(s): E.) A. Felix

### **100B. Cultural Theory in the Americas. S**

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. (Formerly Culture and Society: Culture in a Global Context.) Prerequisite(s): courses 100 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to sophomore, junior, and senior Latin American and Latino studies majors, minors, and combined majors. (General Education Code(s): E.) C. Ramirez

### **100L. Writing Lab (2 credits). W**

This course accompanies course 100A. Participants receive feedback and guidance on their written exercises required for course 100A. Students submit drafts in advance and receive feedback from course 100A writing tutors as well as engage in peer-to-peer learning. Consistent attendance is required. Prerequisite(s): concurrent enrollment in course 100A required. Enrollment restricted to junior and senior Latin American and Latino studies majors, minors, and combined majors. Enrollment limited to 60. A. Felix

### **101. Using Media. \***

Hands-on survey of print, broadcast, audiovisual, and electronic media. Students complete and present a dozen different media production assignments as part of

permanent portfolio. Assignments have Latino/Latin American focus. Peer critique of media projects. Prerequisite(s): concurrent enrollment in course 101L. (General Education Code(s): E.) The Staff

### **101L. Using Media: Video Laboratory (2 credits). \***

Trains students in the fundamentals of video preparation, production and post-production through Social Sciences Media Laboratory. Prerequisite(s): concurrent enrollment in course 101. The Staff

### **102. Writing for Latin America and Latino Studies Majors and Minors. \***

For Latin American and Latino studies students who wish to gain greater awareness of rhetorical modes and the academic essay. Students write several academic essays, each with a different purpose, and master the conventions of revising and editing. (Formerly Advanced Expository Writing Workshop.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to Latin American and Latino studies majors, minors, and combined majors. Enrollment limited to 25. The Staff

### **111. The U.S.-Mexican Border Region. \***

Global and national forces have transformed the 2,000-mile United States/Mexico border region into a site for world market factories. Analyzes how this transformation has affected workers and communities and systematically reviews subjective responses. (General Education Code(s): E.) J. Borrego, The Staff

### **112. Immigration and Assimilation. \***

Examines immigration to U.S. from colonial era to present with special emphasis on issues of citizenship, social identities, and social membership. (Formerly American Studies 112.) (General Education Code(s): ER.) C. Ramirez

### **114. Forced Migration, Resettlement, and Resistance in Latin America. \***

Introduces themes, theories, and concepts addressing forced migration. Studies the economic development, and conflict-induced displacement in multiple Latin American countries with a focus on Colombia. Draws on research from sociology, history, political science, and anthropology, examining why people migrate and what is forced migration. The Staff

### **115. Mexico-United States Migration. S**

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. Enrollment restricted to sophomores, juniors and seniors. A. Felix

### **121. Antropologia de las juventudes. \***

Taught in Spanish. Overview of the social construction of youth identities represented by intertwined liminal processes linked to the history of migration and ethnicity. Explores theoretical approaches on border youth and methodological strategies. Enrollment restricted to Latin

## Latin American and Latino Studies

American and Latino studies majors, minors, and combined majors. Enrollment limited to 25. (General Education Code(s): CC.) The Staff

**122. Media and Nationalism. \***  
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. Enrollment restricted to juniors and seniors. Enrollment limited to 40. (General Education Code(s): E.) C. Rivas

**124. Brazilian Cinema. \***  
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. (Formerly course 80T.) Enrollment limited to 80. (General Education Code(s): IM.) The Staff

**127. Genero, Nacion Y Modernidad En El Cine. W**  
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. Enrollment restricted to Latin American and Latino studies majors, minors and combined majors. R. Fregoso

**128. Latino Media in the U.S. \***  
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. (Also offered as Oakes College 128. Students cannot receive credit for both courses.) Enrollment limited to 39. (General Education Code(s): IM, E.) The Staff

**129. Women Filmmakers: Latin American and Latina. \***  
Focuses on the work of a dozen major Latin American and Latina filmmakers from Argentina, Brazil, Venezuela, Mexico, and the U.S., including Maria Luisa Bemberg, Maria Navaro, Matilde Landeta, Lourdes Portillo. Examines contemporary films, from 1960 to present. (General Education Code(s): IM, E.) R. Fregoso

**131. Latino Literatures: Assimilation and Assimilability. \***  
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.) (General Education Code(s): TA.) C. Ramirez

**132. Citizens, Denizens, and Aliens. W**  
Explores the theories and practices of citizenship and the roles citizens and non-citizens play in the state, civil society, and market, with a focus on the ways historical legacies and social forces produce inclusion, exclusion, sameness, and difference. (Formerly American Studies 113C) Enrollment restricted to sophomores, juniors, and seniors. Enrollment limited to 40. (General Education Code(s): ER.) C. Ramirez

**140. Rural Mexico in Crisis. \***  
Focuses on political, social, economic, and environmental changes in rural Mexico from the 1910 revolution through the Zapatista rebellion. Emphasizes the interaction between the state, markets, and rural civil society, covering agrarian reform, agricultural policy, grassroots development initiatives, democratization, indigenous movements, natural resource management, and migration. Prerequisite(s): Previous completion of course 80D recommended. Enrollment restricted to juniors and seniors. Sophomores may enroll with permission from instructor. (General Education Code(s): CC, E.) J. Fox

**143. Race and Ethnicity. \***  
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.) (General Education Code(s): ER, E.) G. Arredondo

**143J. Global Political Economy. \***  
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. J. Borrego, The Staff

**144. Mexicana/Chicana Histories. \***

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. (General Education Code(s): TA, E.) G. Arredondo

**145. Grassroots Social Change in Latin America. \***

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(s): any two Latin American and Latino studies courses or permission of instructor; open to graduate students. Enrollment limited to 40. (General Education Code(s): CC, E.) H. Perla

**148. Action Research in the Americas. \***

This interdisciplinary course analyzes applied social science research strategies, focusing on diverse "evidence-based," public-interest advocacy initiatives. Issues include: voter participation, environmental justice, human rights, fair trade, the World Bank, the North American Free Trade Agreement (NAFTA), and immigrant rights. (Meets the

methods requirement in Latin America and Latino studies.) Prerequisite(s): course 100A or equivalent, or by permission of instructor. J. Fox

**149. U.S. Foreign Policy Toward Latin America. \***

Examines how domestic political considerations and transnational forces influence the formation of U.S. foreign policy, specifically in the context of relations with Latin America. Explores the impact of institutional, electoral, and psychological pressures, public opinion, interest groups, non-state actors, and the media on decision-making regarding U.S. foreign policy toward Latin America, specifically on support for military intervention. (Meets the methods requirement in Latin America and Latino studies.) (General Education Code(s): PE-H.) H. Perla

**150. Afro-Latinos/as: Social, Cultural, and Political Dimensions. W**

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. (General Education Code(s): ER.) S. Falcon

**152. Consumer Cultures Between the Americas. F**

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. (Meets the methods requirement in Latin America and Latino studies.) (General Education Code(s): CC, E.) C. Rivas

**155. Latin American and Latino Youth Movements. F**

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. J. Taft

**158. Latin American Political Economy. S**

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. F. Leiva

**159. Latinos and Population Change. \***

Examines key theories of demographics change (fertility, mortality, and migration) in important policy issues, such as the aging of America, racial categorization, and immigration. Explores political and economic factors that have led to the changing face of the U.S. over the last century and key legislative changes that have changed the experience of immigrants. Students use primary demographic data from the U.S. Census Bureau and learn basic tools for demographic data access and

presentation. (Formerly Latin American and Latino Studies 163.) (Also offered as Sociology 159. Students cannot receive credit for both courses.) Prerequisite(s): course 100A or Sociology 103A or Sociology 105A, or by permission of instructor. Enrollment restricted to sophomores, juniors, and seniors. (General Education Code(s): PE-H, E.) The Staff

**161P. Theater in the "Chicano Power" Movement. \***

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. (Also offered as Theater Arts 161P. Students cannot receive credit for both courses.) (General Education Code(s): ER, A, E.) The Staff

**164. Environmental Justice. \***

Introduces students to participatory-action research, which both creates positive social-environmental change and contributes to scientific knowledge. Through collaboration with environmental justice organizations, students develop research skills, hone critical reflection abilities, and understand the connections between race, ethnicity, power, poverty, and environmental problems. (Formerly Action-Research for Social Change, Environmental Quality: Lessons Learned from Latin America, U.S..) Enrollment restricted to sophomores, juniors, and seniors. Enrollment limited to 35. (General Education Code(s): PE-E, E.) F. Lu

**165. Contemporary Peru. F** 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. (General Education Code(s): CC.) S. Falcon

**166. Latino Families in Transition. W**

Explores the complex nature of Latino families in the U.S., which like other American families are undergoing profound changes. Placing families within a historical context of post-1960s social transformations, such as feminism, immigration, and multiple-earner households, course examines how family members adapt, resist, and/or construct alternative visions and practices of family life. (Meets the methods requirement in Latin America and Latino studies.) Prerequisite(s): course 1. (General Education Code(s): ER, E.) P. Zavella

**168. Economic History of Latin America. \***

Sheds light on Latin America's contemporary social and economic developments by providing an appreciation of their historical roots. Focusing on the period from independence until WWII, evaluates contesting explanations for Latin America's relatively poor economic performance and divergent policy implications. Prerequisite(s): course 1. (General Education Code(s): E.) H. Shapiro

**169. Latin American Industrialization in a Global Perspective: Past, Present, and Future. \***

Analyzes the economic, political, and social aspects of the industrialization process in Latin

America. Evaluates import substitution policies, the changing roles of the state and foreign and domestic capital, and the impact of recent trade liberalization. Compares Latin America's development with that of the East Asian newly-industrialized countries (NICs) and looks at the implications of globalization. (General Education Code(s): CC, E.) H. Shapiro

**170. Indigenous Struggles in the Americas. \***

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. (General Education Code(s): CC, E.) The Staff

**171. Talleres de Poesía. \***

Taught in Spanish. Develops creative writing skills through reading, discussion, and a progression of hands-on group poetry-writing sessions. Enrollment restricted to juniors and seniors. Enrollment limited to 25. (General Education Code(s): A.) D. Zamora-Evans

**172. Visualizing Human Rights. \***

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.) R. Fregoso

**174. Immigration and Citizenship: A Global Perspective. \***

Examines U.S. immigration policy in comparison to other major destinations. Class discusses relevant socio-economic and political factors and the various citizenship paradigms in place throughout the world. Readings draw on disciplinary foci, including quantitative and qualitative analysis. (General Education Code(s): PE-H.) The Staff

**175. Migration, Gender, and Health. F**

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. (General Education Code(s): ER, E.) P. Zavella

**176. Gender, the Nation, and Latina Cinema. S**

Applies critical and cultural theories of interculturality, coloniality of power and transnational feminism to the study of Latina cinematic imaginaries in the Americas. Explores images and self-representations of race, sexuality, and the nation; citizenship, diaspora, and belonging; gender violence and state violence; militarization, human rights, and gender justice. (General Education

Code(s): IM, E.) R. Fregoso, The Staff

**178. Gender, Transnationalism, and Globalization. \***

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. Enrollment limited to 40. (General Education Code(s): ER, E.) R. Fregoso, The Staff

**180. Borders: Real and Imagined. \***

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.) (General Education Code(s): TA, E.) G. Arredondo

**186. Field Research Methods. W**

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(s): course 100, and 100A or 100W.

Enrollment restricted to junior and senior Latin American and Latino studies majors, and combined majors. S. Falcon

**190. Internship. F,W,S**

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. May be repeated for credit. The Staff

**190F. Internship (2 credits). F,W,S**

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. May be repeated for credit. The Staff

**191. Latin American Studies Teaching Apprenticeship. F,W,S**

Advanced students serve as facilitators for small discussion groups or aid in reading of papers related to Latin American Studies courses. Students are expected to read all course assignments and meet with instructors to discuss the teaching process. May not be counted toward major requirements. The Staff

**192. Directed Student Teaching. F,W,S**

Teaching under faculty supervision of a lower-division course in Latin American and Latino studies,

## Latin American and Latino Studies

normally done by majors in the final quarter of study as the senior project. (See course 42.) Students submit petition to sponsoring agency. The Staff

### **193. Field Study. F,W,S**

Supervised off-campus (domestic or international) study that entails working closely with faculty. Typically undertaken as part of fulfilling the senior exit requirement. Students need to be in good to excellent standing and show preparation to undertake field study (e.g., relevant coursework, appropriate language skills, etc.). May be repeated for credit. The Staff

### **194C. Criminalizing the Poor. \***

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. Enrollment restricted to junior and senior Latin American and Latino studies majors and minors; and combined majors with global economics, sociology, literature, and politics. Enrollment limited to 25. (General Education Code(s): ER.) P. Zavella

### **194F. Latinos and Socio-Political Change. \***

Explores the role of Latinos in civic and political life in the U.S., focusing on specific avenues for participation such as religion, work, and transnational experiences. Examines barriers to participation experienced by Latinos in the U.S. as well as relationships between civic engagement and political incorporation and the ramifications for inequality for Latinos and other ethnic/racial groups in cities across America. (Formerly Latino Civic Engagement in Comparative

Perspective.) Enrollment restricted to junior and senior Latin American and Latino studies majors, minors, and combined majors. Enrollment limited to 25. (General Education Code(s): PE-H, E.) S. Gleeson

### **194G. Chile: Social and Political Change. \***

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. Enrollment restricted to junior and senior Latin American and Latino studies majors, minors, and combined majors. Enrollment limited to 25. (General Education Code(s): CC, E.) W. Goldfrank

### **194H. Central American Political Relations with the U.S. S**

Writing- and research-intensive senior seminar on U.S.-Central American relations. Students gain understanding of Central American political history; the region's relations with the United States; and the problems arising from this relationship. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to junior and senior Latin American and Latino studies majors, minors, and combined majors. Enrollment limited to 25. (General Education Code(s): W, E.) H. Perla

### **194I. Contemporary Ecuador. \***

The Andean nation of Ecuador exemplifies cultural and biological diversity, rapid economic and social change, and increasing geopolitical influence as one of the current South American left-leaning countries. Course looks at Ecuador's

recent history and future challenges. Enrollment restricted to junior and senior Latin American and Latino studies majors, minors, and combined majors. Enrollment limited to 25. (General Education Code(s): CC.) F. Lu

### **194M. Twentieth-Century Revolutions. \***

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. Enrollment restricted to junior and senior Latin American and Latino studies majors, minors, and combined majors. Enrollment limited to 25. (General Education Code(s): CC, E.) G. Arredondo, W. Goldfrank

### **194Q. Globalization in the Américas. F**

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. Enrollment restricted to junior, and senior Latin American and Latino studies majors, minors, and combined majors. Enrollment limited to 25. (General Education Code(s): CC.) S. Falcon

### **194R. Violencia Cotidiana en las Americas. F**

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. Enrollment

## Latin American and Latino Studies

restricted to junior and senior Latin American and Latino studies majors, minors, and combined majors. Enrollment limited to 25. (General Education Code(s): E.) C. Rivas

### **194S. La Crisis del Campo Mexicano. \***

Taught in Spanish. Analyzes both the causes and possible solutions to the challenges of rural poverty and democratization. Focuses on agrarian reform; agricultural development; protest movements; electoral change; local government; grassroots development initiatives; natural resources; the social construction of ethnicity, gender, and class; and the dynamics of migration. Mexico's regional diversity is highlighted as well, and students are encouraged to study a particular region in depth to accompany the course's national overview. (Formerly El Campo Mexicano en Crisis.) Enrollment restricted to junior, and senior Latin American and Latino studies majors, minors, and combined majors with global economics, sociology, literature, and politics. Enrollment limited to 25. J. Fox

### **194T. Youth and Citizenship. W**

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. Enrollment restricted to junior and senior Latin American and Latino studies majors, minors, and combined majors during priority enrollment only. J. Taft

### **195B. Senior Project. F,W,S**

Senior thesis writing under direction of major adviser. Students

submit petition to sponsoring agency. May be repeated for credit. The Staff

### **195C. Senior Project. F,W,S**

Senior thesis writing under direction of major adviser. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **196. Field Study Seminar. \***

Emphasizes ethnographic strategies of fieldwork. Primarily oriented to students interested in understanding the daily life of societies and cultures. Prepares students both to conduct fieldwork, and to process their fieldwork experience. Covers complexities related to the experience of "stepping out of" one's own culture. Prerequisite(s): concurrent enrollment in course 196L. Enrollment restricted to sophomores, juniors, and seniors. Enrollment limited to 25. J. Borrego

### **196L. Field Study Seminar Lab (2 credits). \***

Media lab trains students in the use of electronic and photographic media for the acquisition of field data. Through lectures, demonstrations, hands-on field exercises and review of students' media exercises, students will learn the fundamentals of photography, video production, and audio recording in the field. Prerequisite(s): concurrent enrollment in course 196. Enrollment restricted to sophomores, juniors, and seniors. Enrollment limited to 25. J. Borrego

### **198. Field Study. F,W,S**

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. May be repeated for credit. The Staff

### **198F. Independent Field Study (2 credits). F,W,S**

Individual studies undertaken off-campus. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

Supervised directed reading; weekly or biweekly meetings with instructor. Final paper or examination required. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

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. May be repeated for credit. The Staff

## GRADUATE COURSES

### **200. Bridging Latin American and Latina/o Studies. F**

Explores social, cultural, economic, and political changes that connect Latin America and U.S. Latina/o communities. The objective of this interdisciplinary team-taught course is to bridge previously distinct research approaches of Latin American and Latina/o studies to better understand processes that link peoples and ideas across borders as well as help students to conceptually and methodologically identify and design new objects of study and revisit traditional approaches. Core requirement for students pursuing the Parenthetical Notation in Latin

American and Latino studies.  
Enrollment restricted to graduate students. G. Arredondo

**200A. Power and Society. S**  
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. Enrollment is restricted to graduate students. Enrollment limited to 15. P. Zavella

**200B. Theories of Culture in the Americas. S**  
Introduces foundational theories and problems organized around questions of culture and epistemology; emphasizes developing interdisciplinary, humanities-based interpretive and analytic skills for understanding how culture is conceptualized; draws from critical social and cultural theories. Enrollment is restricted to graduate students. Enrollment limited to 15. R. Fregoso

**210. Latina Feminisms: Theory and Practice. \***  
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. Enrollment restricted to graduate students. P. Zavella

**211. Paradigms of Race/Color, Sexuality, and Culture in Latin America. S**  
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. Enrollment is restricted to graduate students. Enrollment limited to 15. L. Martinez-Echazabal

**212. Latina/o Ethnographic Practice. \***  
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. Enrollment restricted to graduate students. P. Zavella

**215. Latina Cultural Studies: Culture, Power, and Coloniality. \***  
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. (Formerly Latina Cultural Studies: Transborder Feminist Imaginaries.) Enrollment

restricted to graduate students. R. Fregoso

**220. Transnational Civil Society: Limits and Possibilities. \***  
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. Enrollment restricted to graduate students. J. Fox

**225. Race in the Americas. \***  
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. Enrollment restricted to graduate students. Enrollment limited to 15. G. Arredondo

**230. Political Ecology in Latin America. \***  
Examines the foundations and current literature on political ecology, with emphasis on issues in Latin America. Topics include the appropriation of "Nature;" degradation and deforestation; conservation policies and politics; land distribution and property; and indigenous resistance. Enrollment restricted to graduate students. F. Lu

**240. Culture and Politics of Human Rights. \***  
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. (Also offered as Feminist Studies 240. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. R. Fregoso

**242. Globalization, Transnationalism, and Gender in the Américas. \***

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 Américas and their implications for race, space, work, social movements, migration, and construction of collective memory. Enrollment restricted to graduate students. P. Zavella, R. Fregoso

**243. Comparative Methods. W**

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. (Also offered as Politics 243. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. Enrollment limited to 15. K. Eaton, J. Fox

**244. U.S. Political Relations with Latin America. \***

Examines relations between the U.S. and Latin America. Emphasizes the domestic and global contexts within which U.S. leaders defined national economic, strategic, and ideological interests, and their regional policy objectives. Explores the impact of Latin Americans' nationalistic, anti-imperialist, class, racial, and gender struggles that often shaped policy outcomes in ways unanticipated by the U.S. Special focus on sharpening graduate students' research design. Enrollment restricted to graduate students. H. Perla

**245. Epistemologies of the South. F**

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." Enrollment is restricted to graduate students. Enrollment limited to 15. F. Leiva

**297. Independent Study. F,W,S**

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. May be repeated for credit. The Staff

**299. Thesis Research. F,W,S**

Enrollment restricted to graduate students and permission of instructor. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# LEGAL STUDIES

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2015-16 General Catalog

27 Merrill College

(831) 459-2056

[legalstudies@ucsc.edu](mailto:legalstudies@ucsc.edu)

[Department web site](#)

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## PROGRAM DESCRIPTION

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Legal studies is an interdisciplinary major offered under the auspices of the Politics Department. It is designed for students who wish to use the methods and perspectives of various academic disciplines to study legal issues and to use the conceptual framework of the law to illuminate empirical and theoretical concerns in the various disciplines. For example, a student might use approaches from psychology and philosophy to study the legal problem of punishment; or draw on doctrinal categories from public and private law to study the changing historical role of market and nonmarket relations within ongoing institutions; or use approaches from critical race theory and feminist studies to better understand matters of civil rights and privacy.

To complete the major, students are required to take courses in legal institutions, constitutional law, and international law, as well as take courses in each of three broad themes: legal theory and philosophy, the role of law in society, and legal institutions. Each of these themes is intentionally broadly defined. Within legal theory, students may take courses in legal jurisprudence, logic, and theories of crime and punishment; within law and society, courses range from feminism and race to psychology and economics; within public law and institutions, courses range from environmental law to human rights law to an introduction to litigation. Students are also expected to take an introductory course in philosophy. To fulfill the senior exit requirement, students have the option to write a senior thesis or take a senior capstone seminar. The seminar topic changes quarterly.

Legal studies is intended to appeal to students who wish to take a concentration of courses on the law from a variety of disciplinary and methodological perspectives. The major is not intended as a substitute or preparation for any part of a law school curriculum but rather as a full field of study within the liberal arts curriculum. As such, it is a good preparation for a variety of future activities. Students graduating in legal studies are particularly well qualified to pursue

graduate work on legal topics in humanities and social science disciplines or to attend professional school in fields such as public policy, business administration, social work, and law. Students are also encouraged to participate in field work and law-related internships in the community, and to develop their own extensive independent research projects.

Legal studies 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, the UCSC/UC Hastings Law School 3+3 Program in which students earn B.A. and J.D. degrees in six years, and the Education Abroad Program (EAP).

Declaring the major in legal studies is a two-step process: 1) complete and pass Legal Studies 10 with a grade of C or better; 2) attend a declaration orientation workshop.

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.

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## PROGRAM LEARNING OUTCOMES

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Upon completion of the major, students will have met the following objectives.

an understanding of the nature and function of law, including legal theory, institutions, and analysis;

an understanding the role of law and legal institutions in the broader society, including the social, political, and economic context in which it operates;

an understanding the unique 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

## Legal Studies

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.

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### REQUIREMENTS OF THE MAJOR

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#### LOWER-DIVISION COURSE REQUIREMENTS—2 COURSES

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Legal Studies 10, Introduction to Legal Process. All students are required to complete and pass legal studies 10 prior to declaring the major.

Philosophy 9, 22, or 24. All legal studies majors are required to take one of the three listed

Philosophy courses. (See the Philosophy section in this catalog for course descriptions.)

#### UPPER-DIVISION COURSE REQUIREMENTS—2 COURSES

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111A, Constitutional Law or 111B, Civil Liberties and 160B International Law

#### CORE COURSE REQUIREMENTS—6 COURSES

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Students are required to take six core courses, two in each of three concentrations: theory, public law and institutions, and law and society.

##### Theory

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103 Feminist Interventions (Politics course)  
105A Ancient Political Thought  
105B Early Modern Political Thought  
105C Modern Political Thought  
106 Marxism as a Method  
107 Political Morality of Survivorship and Recovery  
109 Legal Theory  
109 Orientalism (Politics course)  
115 Law and the Holocaust  
128J The World Jury on Trial  
144 Social and Political Philosophy  
146 Philosophy of Law  
155 Topics in American Legal History  
157 Political Jurisprudence

##### Public Law and Institutions

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111A Constitutional Law  
111C Issues in Constitutional Law  
115 Law and the Holocaust  
116 Comparative Law

120A Congress, President, and the Court in American Politics

120C State and Capitalism in American Political Development

125 History of U.S. Penal Law

128 Poverty and Public Policy

128J The World Jury on Trial

128M International Law and Global Justice

131 Wildlife, Wilderness, and the Law

132 California Water Law and Policy

133 Law of Democracy

134 Congress: Representation and Legislation in Comparative Perspective

135 Native Peoples Law

136 Federal Indian Law and Tribal Sovereignty

137 International Environmental Law and Policy

139 War Crimes

149 Environmental Law and Policy

152 Courts and Litigation

155 Topics in American Legal History

156 Administrative Jurisprudence

159 Property and the Law

167 Politics of International Trade

171 Law of War

175 Human Rights

##### Law and Society

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107 Political Morality of Survivorship and Recovery

110 Law and Social Issues

111B Civil Liberties

112 Women and the Law (Politics)

113 Gay Rights and the Law

114 Jews, Anti-Semitism, and the American Legal System

120B Society and Democracy in American Political Development

120C State and Capitalism in American Political Development

121 Black Politics and Federal Social Policy

122 The Sociology of Law

123 Law, Crime, and Social Justice

126 Law and Politics in Contemporary Japan and East Asian Societies

128I Race and Criminal Justice

127 Drugs and Society

## Legal Studies

- 135 Native Peoples Law
- 138 Political Anthropology
- 142 Anthropology of Law
- 147A Psychology and Law
- 147B Psychology and Law
- 150 Children and the Law
- 151 Politics of Law
- 154 The Legal Profession
- 155 Topics in American Legal History
- 160A Industrial Organization
- 162 Legal Environment of Business
- 169 Economic Analysis of the Law
- 180 Power, Politics, and Protest
- 183 Women in the Economy

### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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Students of 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 paths:

1. Completion of Legal Studies 111A and Legal Studies 160B or
2. Completion of Legal Studies 196 or
3. Completion of a senior thesis, Legal Studies 195A, B, C.

### COMPREHENSIVE REQUIREMENT—1 COURSE

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Students can satisfy the comprehensive requirement in the legal studies major by successfully completing one of the following:

195ABC, SENIOR THESIS. Completion of a senior thesis project of a minimum of 50 pages with a substantial research content, supervised by a legal studies faculty member.

196, SENIOR CAPSTONE. The capstone course is designed to provide an interdisciplinary integration of themes related to the study of law and includes a substantial writing requirement.

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### HONORS

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Honors in the legal studies major are awarded to graduating seniors, based primarily on a review of grades, whose academic performance is judged to be consistently excellent by a faculty committee. Highest honors in the major are reserved for students with consistently outstanding academic performance.

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### TRANSFER STUDENTS

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A student transferring to UCSC must meet with the legal studies undergraduate adviser as early as possible to discuss declaring the major and course enrollment. This ensures a smooth transition. Students should bring a copy of their UCSC Transfer Credit Summary, which may be printed from the student portal.

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### REQUIREMENTS FOR THE MINOR

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To complete a minor in legal studies, a student must take Legal Studies 10 and any five upper-division legal studies core courses numbered 101-190.

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## LEGAL STUDIES FACULTY AND PROFESSIONAL INTERESTS

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**Elizabeth Beaumont, Associate Professor, Politics**  
Constitutionalism, democracy, and American political development; civic engagement and education; citizenship, rights, and problems of inequality; social movements and popular constitutionalism

**Donald Brenneis, Professor of Anthropology**  
Linguistic anthropology, folklore, legal anthropology, ethnomusicology, overseas Indians, South Asia, disputing and dispute management, legal language, bureaucratic institutions, knowledge production, improvisation

**Ryan Coonerty, Lecturer, Legal Studies**  
American political history, law and international relations

**Gina Dent, Associate Professor, Feminist Studies, History of Consciousness, and Legal Studies**  
Africana literary and cultural studies, legal theory, popular culture

**Hiroshi Fukurai, Professor of Sociology**  
Citizen participation in law, race and the law, indigenous approach to international law, decolonialism, Japan and East Asia, advanced quantitative methods, survey research

**Craig W. Haney, Professor of Psychology**  
Applications of social psychological principles to legal settings, assessment of the psychological effects of living and working in institutional environments, social contextual origins of violence, development of alternative legal and institutional forms

## Legal Studies

### **Ruth Langridge, Lecturer, Legal Studies**

Water resource issues, including control over, access to, and management of water; climate change; groundwater management, and broader theoretical and political issues related to property; institutions form and change; the social, political and environmental impacts and beneficiaries of current rules; and the consequences of proposed changes

### **Mark Fathi Massoud, Associate Professor of Politics**

Law and society; human rights; international law and development, with a special interest in Sudan; field research, with an emphasis on qualitative and ethnographic methods

### **Triloki Nath Pandey, Professor of Anthropology**

Native peoples of North America, cultures of India, political anthropology, anthropological theories and comparisons

### **Daniel M. Press, Professor of Environmental Studies**

U.S. environmental politics and policy, social capital and democratic theory, industrial ecology, land and species conservation, regionalism

### **Craig Reinerman, Professor of Sociology**

Political sociology; law, crime, and social justice; drugs and society

### **Daniel J. Wirls, Professor of Politics**

American politics, including national political institutions (Congress) and the President; public policy (military and foreign policy) and political history

### **Donald A. Wittman, Professor of Economics**

Economic theory, politics, law



### **Dane Archer, Emeritus**

### **John Dizikes, Emeritus**

### **Walter L. Goldfrank, Emeritus**

### **Michael E. Urban, Emeritus**

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## LEGAL STUDIES COURSES

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### LOWER-DIVISION COURSES

#### **10. Introduction to Legal Process. F,W**

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? (General Education Code(s): IS.)  
The Staff

### UPPER-DIVISION COURSES

#### **105A. Ancient Political Thought. F**

Ancient political ideas in context of tension between democracy and empire, emergence of the psyche, and shift from oral to written

culture. Emphasis on Athens, with Hebrew, Roman, and Christian departures and interventions. Includes Sophocles, Thucydides, Socrates, Plato, Aristotle, Stoics, the Bible, and Augustine. (Also offered as Politics 105A. Students cannot receive credit for both courses.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. D. Mathiowetz

#### **105B. Early Modern Political Thought. W**

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. (Also offered as Politics 105B. Students cannot receive credit for both courses.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. V. Seth

#### **105C. Modern Political Thought. S**

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. (Also offered as Politics 105C. Students cannot receive credit for both courses.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. The Staff

#### **106. Marxism as a Method. S**

Examines Marx's use of his sources in political philosophy and political economy to develop a method for analyzing the variable ways in which social change is experienced as a basis for social action. Provides a similar analysis of contemporary materials. Contrasts and compares Marxian critiques of these materials and readings based on Nietzsche,

## Legal Studies

psychoanalysis, cultural studies, and rational choice materialism. (Also offered as Politics 106. Students cannot receive credit for both courses.) Enrollment restricted to legal studies majors during priority enrollment only. The Staff

### **108. Gender, Sexuality, and Law. \***

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. Enrollment restricted to sophomore, junior, and senior legal studies majors during priority enrollment only. The Staff

### **109. Legal Theory. \***

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. Enrollment restricted to legal studies majors during priority enrollment only. The Staff

### **110. Law and Social Issues. W**

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. (Also offered as Politics 110. Students cannot receive credit for both courses.) Enrollment restricted to politics, legal studies, and Latin American and Latino studies/politics combined majors during priority enrollment only. The Staff

### **111A. Constitutional Law. S**

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. (Also offered as Politics 111A. Students cannot receive credit for both courses.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to legal studies majors during priority enrollment only. The Staff

### **111B. Civil Liberties. \***

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. Enrollment restricted to legal studies majors during priority enrollment only. The Staff

### **111C. Issues in Constitutional Law. W**

Examines variety of topics in constitutional law that are not covered in courses 111A and 111B. Focuses primarily on Supreme Court decisions and common-law debates. Enrollment restricted to legal studies majors during priority enrollment. R. Coonerty

### **113. Gay Rights and the Law. \***

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. The Staff

### **114. Jews, Anti-Semitism, and the American Legal System. \***

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. Enrollment restricted to legal studies majors during priority enrollment only. The Staff

### **115. Law and the Holocaust. \***

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. Enrollment restricted to legal studies majors during priority enrollment only. The Staff

### **116. Comparative Law. \***

Explores legal systems and legal rules around the world, for a better understanding of the factors that have shaped both legal growth and legal change. Particular attention given to differences between common and civil law systems, changes brought about by the European Union, and expansion of legal norms around the globe. (Also offered as Politics 116. Students cannot receive credit for both courses.) Enrollment restricted to

## Legal Studies

legal studies majors during priority enrollment only. The Staff

### **118. Law and Literature. \***

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. (Formerly course 138.) Enrollment restricted to legal studies majors during priority period. The Staff

### **120A. Congress, President, and the Court in American Politics. W**

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. (Also offered as Politics 120A. Students cannot receive credit for both courses.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Satisfies American History and Institutions Requirement. D. Wirls

### **120B. Society and Democracy in American Political Development. S**

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. (Also offered as Politics 120B. Students cannot receive credit for both courses.)

Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Satisfies American History and Institutions Requirement. M. Springer

### **120C. State and Capitalism in American Political Development. \***

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. (Also offered as Politics 120C. Students cannot receive credit for both courses.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Satisfies American History and Institutions Requirement. E. Bertram

### **121. Black Politics and Federal Social Policy. \***

Examination of changes in the political and economic status of African Americans in the 20th century; particular focus on the role of national policies since 1933 and the significance of racism in 20th-century U.S. political development. (Also offered as Politics 121. Students cannot receive credit for both courses.) Enrollment restricted to legal studies majors during priority enrollment. (General Education Code(s): E.) M. Brown

### **122. The Sociology of Law. \***

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. (Also offered as Sociology 122. Students cannot receive credit for both courses.) Enrollment restricted to legal studies majors and minors. C. Reinerman

### **123. Law, Crime, and Social Justice. F**

Blends the latest research in criminology with that from social stratification, inequality, and social welfare policy with the objective of exploring the relationship between levels of general social justice and specific patterns of crime and punishment. The focus is primarily on the U.S. although many other industrialized democracies are compared. An introductory course in sociology is recommended as preparation. (Also offered as Sociology 123. Students cannot receive credit for both courses.) The Staff

### **125. History of the U.S. Penal Culture. \***

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." Enrollment restricted to legal studies majors during priority enrollment only. The Staff

### **126. Law and Politics in Contemporary Japan and East Asian Societies. \***

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

## Legal Studies

Haydon legislation that allows war victims to sue the Japanese government and corporations in California. (Also offered as Sociology 128. Students cannot receive credit for both courses.) Enrollment limited to 30. H. Fukurai

### **127. Drugs in Society. \***

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. (Also offered as Sociology 127. Students cannot receive credit for both courses.) Enrollment restricted to legal studies majors and minors. C. Reinerman

### **128. Poverty and Public Policy. \***

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. (Also offered as Economics 128. Students cannot receive credit for both courses.) Prerequisite(s): Economics 100A or 100M, and Economics 113. Enrollment restricted to economics, business management economics, global economics, legal studies, or economics combined majors. (General Education Code(s): E.) L. Kletzer, R. Fairlie

### **128I. Race and Law. F**

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) (Also offered as Sociology 128I. Students cannot receive credit for both courses.) Enrollment is restricted to sophomores, juniors, and seniors. H. Fukurai

### **128J. The World Jury on Trial. \***

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. (Also offered as Sociology 128J. Students cannot receive credit for both courses.) Enrollment restricted to sophomores, juniors, and seniors. Enrollment limited to 30. H. Fukurai

### **128M. International Law and Global Justice. W**

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. (Also offered as Sociology 128M.

Students cannot receive credit for both courses.) Enrollment restricted to juniors and seniors. Enrollment limited to 30. H. Fukurai

### **130. Race and the Law. \***

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. Enrollment restricted to legal studies majors during priority enrollment. The Staff

### **131. Wildlife, Wilderness, and the Law. \***

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. Enrollment restricted to sophomore, junior, and senior legal studies majors during the priority period. R. Langridge

### **132. California Water Law and Policy. W**

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. (Also offered as Politics 132. Students cannot receive credit for both courses.) R. Langridge

**133. Law of Democracy. S**

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. (Also offered as Politics 133. Students cannot receive credit for both courses.) Enrollment restricted to legal studies majors during priority enrollment. R. Coonerty

**134. Congress: Representation and Legislation. \***

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. (Formerly Congress: Representation and Legislation in Comparative Perspective.) (Also offered as Politics 134. Students cannot receive credit for both courses.) Enrollment restricted to legal studies majors during priority enrollment only. D. Wirls

**135. Native Peoples Law. \***

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. Enrollment restricted to legal studies majors during priority enrollment only. (General Education Code(s): E.) The Staff

**136. Federal Indian Law and International Comparative Indigenous Peoples' Law. \***

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. Enrollment restricted to legal studies majors during priority period. (General Education Code(s): E.) The Staff

**137. International Environmental Law and Policy. \***

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. Enrollment restricted to legal studies majors during priority period. The Staff

**138. Political Anthropology. \***

The ideas, in selected non-Western societies, about the nature of power, order, social cohesion, and the political organization of these societies. (Also offered as Anthropology 138. Students cannot receive credit for both courses.) Offered in alternate academic years. T. Pandey

**139. War Crimes. \***

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. Enrollment restricted to legal studies majors during priority period. The Staff

**142. Anthropology of Law. \***

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. (Also offered as Anthropology 142. Students cannot receive credit for both courses.) Enrollment restricted to anthropology and legal studies majors. D. Brenneis

**146. Philosophy of Law. \***

Exploration of selected problems in jurisprudence: "legal reasoning" and social policy, rules and individual cases, the mental element in the law, punishment and responsibility, causation and fault, liberty and paternalism, etc. (Formerly Philosophy 146.) (Also offered as History of Consciousness 146. Students cannot receive credit for both courses.) J. Neu

**147A. Psychology and Law. W**

Current and future relationships between law and psychology, paying special attention to gaps between legal fictions and

## Legal Studies

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. (Also offered as Psychology 147A. Students cannot receive credit for both courses.) Psychology 3 or 100 and 40 are recommended prior to taking this course. Enrollment restricted to psychology, pre-psychology, and legal studies majors. C. Haney

**147B. Psychology and Law. \*** 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. (Also offered as Psychology 147B. Students cannot receive credit for both courses.) Prerequisite(s): course 147A. C. Haney

**149. Environmental Law and Policy. S** 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. (Also offered as Environmental Studies 149. Students cannot receive credit for both courses.) Enrollment restricted to junior and senior legal studies majors. T. Duane

**150. Children and the Law. \*** 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. Enrollment restricted to legal studies majors during priority period. The Staff

**151. Politics of Law. F** 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. (Also offered as Politics 151. Students cannot receive credit for both courses.) Enrollment restricted to politics, legal studies, and Latin American and Latino studies/politics combined majors during priority period. The Staff

**152. Courts and Litigation. \*** 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. Enrollment restricted to legal studies majors during priority period. The Staff

**154. The Legal Profession. \*** 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. Enrollment restricted to legal studies majors during priority period. The Staff

**155. Topics in American Legal History: Making of American Constitutionalism. \*** 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 priority period. Enrollment limited to 20. The Staff

**156. Administrative Jurisprudence. \*** 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. Enrollment restricted to legal studies majors during priority period. The Staff

**157. Political Jurisprudence. \*** Explores some themes in legal and political theory, especially on the relationship of theories of justice, law, and ethics. Enrollment restricted to legal studies majors during priority period. The Staff

**159. Property and the Law. F** Beginning with an examination of the concept of property, the class covers how different cultures characterize property and determine "ownership" and the laws and policies that define

## Legal Studies

property in modern society. Topics include theories of property law, common property, property and natural resources, zoning, regulatory takings, and property on the Internet. Enrollment restricted to legal studies majors during priority period. R. Langridge

**160A. Industrial Organization. \***  
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. (Also offered as Economics 160A. Students cannot receive credit for both courses.) Prerequisite(s): Economics 100A or 100M. The Staff

**160B. International Law. W**  
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. (Formerly course 173.) (Also offered as Politics 160B. Students cannot receive credit for both courses.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. The Staff

**162. Legal Environment of Business. \***  
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. (Also offered as Economics 162. Students cannot receive credit for both courses.) Prerequisite(s): Economics 100A. R. Bosso

**167. Politics of International Trade. \***  
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. (Also offered as Politics 167. Students cannot receive credit for both courses.) Enrollment restricted to legal studies majors during priority enrollment only. The Staff

**169. Economic Analysis of the Law. S**  
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. (Also offered as Economics 169. Students cannot receive credit for both courses.) Prerequisite(s): Economics 100A or 100M or permission of instructor. D. Wittman

**171. Law of War. \***  
Examines legal regulation of international violent conflict. Students examine development of normative standards within international law and creation of institutions to both adjudicate violations and regulate conduct. (Also offered as Politics 171. Students cannot receive credit for both courses.) Enrollment restricted to legal studies majors during priority enrollment only. The Staff

**175. Human Rights. S**  
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. (Also offered as Politics 175. Students cannot receive credit for both courses.) Prerequisite(s): course 160B. Enrollment restricted to legal studies majors during priority enrollment. The Staff

**183. Women in the Economy. S**  
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. (Also offered as Economics 183. Students cannot receive credit for both courses.) Prerequisite(s): Economics 100A or 100M. Economics 113 is strongly recommended. J. Poole

**190R. Comparative Law and Society. \***  
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. (Also offered as Politics 190R. Students cannot receive credit for both courses.) Prerequisite(s): course 160B. Enrollment restricted to senior legal studies majors. Enrollment limited to 20. M. Massoud

**193. Field Study. F,W,S**  
Field research performed off-campus, under the supervision of a member of the legal studies faculty.

## Legal Studies

May be repeated for credit. The Staff

### **194. Group Tutorial. F,W,S**

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. May be repeated for credit. The Staff

### **195A. Senior Thesis. F,W,S**

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. The Staff

### **195B. Senior Thesis. F,W,S**

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. The Staff

### **195C. Senior Thesis. F,W,S**

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. The Staff

### **196. Senior Capstone. W,S**

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(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to senior legal studies majors. (General Education Code(s): W.) The Staff

### **198. Independent Field Study. F,W,S**

Individual studies undertaken off-campus for which faculty supervision is not in person, but by correspondence. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **198F. Independent Field Study (2 credits). F,W,S**

Individual studies undertaken off-campus for which faculty supervision is not in person, but by correspondence. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

A student normally approaches a faculty member and proposes a course 199 on a subject he or she has chosen. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

A student normally approaches a faculty member and proposes a course 199 on a subject he or she has chosen. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# LINGUISTICS

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2015-16 General Catalog

241 and 243 Stevenson College

(831) 459-2905

(831) 459-4988

<http://linguistics.ucsc.edu>

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## PROGRAM DESCRIPTION

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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. 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 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. program 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.

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## PROGRAM LEARNING OUTCOMES

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The program learning outcomes for the linguistics major are the following: (1) capacity for rigorous analytical thinking (e.g., in forming and testing hypotheses), (2) ability to write clearly and articulately, (3) understanding of the general properties of language, (4) active command of linguistic theory and linguistic investigation. For the program learning outcomes for the M.A. and Ph.D. programs, see <http://linguistics.ucsc.edu/graduate/index.html>.

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## QUALIFICATION POLICY FOR THE LINGUISTICS MAJOR

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The Linguistics Department has adopted a major qualification policy for linguistics and 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 course work in the major.

In order to declare the linguistics or language studies major, a student must pass each of the gateway courses, Linguistics 50, Introduction to Linguistics, and Linguistics 53, Semantics 1, with a grade of C+ or better.

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 and 243). This letter should explain any extenuating circumstances that influenced their performance in the gateway courses. Within 15 days of receipt of the appeal, the department will notify the student, the student's college, and the Office of the Registrar of the decision.

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## REQUIREMENTS OF THE LINGUISTICS MAJOR

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Students in the linguistics major are required to complete 12 courses in linguistics and related disciplines. Seven of these are named courses in linguistics:

- 50, Introduction to Linguistics
- 53, Semantics I
- 101, Phonology I
- 102, Phonology II
- 112, Syntax I
- 113, Syntax II
- 116, Semantics II

Five upper-division elective courses in linguistics.

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.

**Foreign language/mathematics competency requirement:** Linguistics majors are required to demonstrate either foreign-language or mathematics competency as follows:

- Foreign-language competency: Students must successfully complete five quarters of language study at UCSC 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 UCSC, 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 and Greek, two quarters will be considered equivalent to three quarters.
- Mathematics competency: Alternatively, students with a strong formal background can choose to satisfy the mathematics 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: Applied Mathematics and Statistics 7 or 131; Computer Engineering 16; Computer Science 5C, 5J, 5P, 10, 11, 12A, 12B, 140, or 148; Mathematics 30, 100, 115, 160, or 161; Philosophy 9; or any course which has one of these courses as a prerequisite.

**Senior exit requirement:** In their senior year, linguistics majors must satisfy the senior exit requirement in one of two ways:

- Option 1: Successful completion of a capstone course (an appropriate upper-division linguistics course). Students must have senior standing and must have completed Linguistics 53, Semantics I; 101, Phonology I; and 112, Syntax I.
- Option 2: Successful completion of a senior thesis supervised by a linguistics 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 Linguistics 195, Senior Thesis.

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## DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in linguistics is satisfied by completing courses 101 and 112.

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## REQUIREMENTS OF THE MINOR

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To graduate with a minor in linguistics, students must complete eight linguistics courses:

- 50, Introduction to Linguistics
- 53, Semantics I
- 101, Phonology I
- 112, Syntax I
- Four upper-division elective courses in linguistics

There is no senior exit requirement and no foreign language/mathematics competency requirement for the minor.

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## COURSES

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The 80-level courses have no prerequisites. They are intended to introduce the concepts of linguistics through their relation to other areas of general interest.

Course 50, Introduction to Linguistics, introduces the subfields of the discipline. Courses 53, Semantics I; 101, Phonology I; and 112, Syntax I, serve as entry courses to the specialized upper-division sequences. Upper-division courses generally have at least one of these courses as a prerequisite.

Several upper-division elective courses are offered each quarter. For a list of these courses, visit the department's web site at [linguistics.ucsc.edu](http://linguistics.ucsc.edu).

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.

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## HONORS

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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 and narrative evaluations 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.

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## PREPARATION FOR THE UCSC MASTER'S DEGREE

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Every year, UCSC students who have the B.A. in linguistics or language studies 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 department's web site (<http://linguistics.ucsc.edu>); and see the department manager. The combined B.A./M.A. program (see below) provides another pathway to the M.A. program.

### The B.A./M.A. Program

The B.A./M.A. program 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 program 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 program 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 program. 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 the course requirements for the M.A. and complete and defend the M.A. thesis by the end of the fifth year.

Students in the B.A./M.A. program 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 program, 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 their fifth year, students in the program will have fulfilled the requirements for both the B.A. and the M.A. degrees. Students who need additional time may remain in the program until the M.A. thesis is completed and defended.

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## GRADUATE PROGRAM

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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 phonetics, phonology, psycholinguistics, semantics, and syntax. Research strengths also include the study of various languages, theoretical and computational morphology, mathematical foundations, and the philosophy of linguistics.

Each year the department admits approximately five new students to the doctoral program and a smaller number of new students to the M.A. program. The master's degree can be completed in one or two years, depending on the student's previous background in linguistics.

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, Hindi, Hungarian, Irish, Japanese, Latin, Nez Perce, Northern Paiute, Persian, Romanian, Russian, Spanish, and Turkish.

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.

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#### 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.

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#### REQUIREMENTS FOR THE M.A.

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**Courses.** A minimum of 45 credits of graduate-level work. This must include foundation courses in phonetics, phonology, psycholinguistics, semantics, and syntax. Electives are typically chosen from upper-division or graduate courses offered by linguistics and related disciplines, and independent study with linguistics faculty.

**Languages.** Reading competence in one foreign language, to be demonstrated by examination.

**Master's thesis.** Submission of a master's thesis in a core area of theoretical linguistics approved by a committee of three faculty members.

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#### REQUIREMENTS FOR THE PH.D.

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**Courses.** A minimum of 65 credits of graduate-level work. This includes foundation sequences in phonetics, phonology, psycholinguistics, semantics, syntax, and experimental or field methods.

**Languages.** Reading competence in one foreign language, to be demonstrated by examination.

**Qualifying papers and examination.** By the end of the third year, two research papers, each in a distinct area, are to be presented as part of the requirements for advancement to candidacy. At this time, the prospective candidate is examined by the faculty on topics related to the student's major area of research, as part of the qualifying examination. The student is expected to defend a dissertation prospectus in the fourth year.

**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.

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#### APPLICATION AND ADMISSION

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To apply, please consult the Department of Linguistics web site (<http://linguistics.ucsc.edu>).

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**LINGUISTICS FACULTY AND PROFESSIONAL INTERESTS**


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**PROFESSOR****Judith Aissen, Research Professor, Emerita**

Syntax, morphology, Mayan languages

**Sandra Chung**

Syntax, semantics, Austronesian languages

**Donka Farkas**

Semantics, morphology, syntax, Romance languages, Hungarian

**Jorge Hankamer**

Syntax, morphology, computational linguistics, Turkish

**Junko Ito**

Phonology, morphology, Germanic languages, Japanese

**William A. Ladusaw**

Semantics, syntax, pragmatics

**James McCloskey**

Syntax, semantics, sociolinguistics, Irish

**Armin Mester**

Phonology, prosodic morphology, Japanese, Latin

**Jaye Padgett**

Phonology, phonetics, Russian, Slavic, Irish

**Geoffrey K. Pullum, Emeritus****ASSOCIATE PROFESSOR****Pranav Anand**

Semantics, pragmatics, syntax, computational linguistics

**Adrian Brasoveanu**

Semantics, pragmatics, probabilistic models of cognition, philosophical logic, optimality

**Grant McGuire**

Phonetics, phonology, psycholinguistics

**Matthew Wagers**

Psycholinguistics, language comprehension, memory

**ASSISTANT PROFESSOR****Maziar Toosarvandani**

Syntax, semantics, pragmatics, Numic (Uto-Aztecan) and Iranian languages

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**LINGUISTICS COURSES**


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**LOWER-DIVISION COURSES****50. Introduction to Linguistics. F,W**

An introduction to the major areas, problems, and techniques of modern linguistics. (General Education Code(s): SI, IH.) A. Brasoveanu, R. Mester

**53. Semantics I. F,W**

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. (General Education Code(s): IH.) P. Anand, D. Farkas

**80C. Language, Society, and Culture. F,S**

The study of language from a sociological perspective. Multilingualism, language change

and variation, pidgins and creoles, the origin and diversification of dialects. (General Education Code(s): CC, T5-Humanities and Arts or Social Sciences.) G. McGuire, J. McCloskey

**80D. Language and Mind. S**

A critical overview of the research program initiated by Noam Chomsky and its implications for theories of the human mind and brain. (Formerly Language and Mind: Chomsky's Program.) (General Education Code(s): T5-Humanities and Arts or Social Sciences.) M. Wagers

**80V. Structure of the English Vocabulary. W**

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. (General Education Code(s): T4-Humanities and Arts.) J. Hankamer

**99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. The Staff

**UPPER-DIVISION COURSES****101. Phonology I. W,S**

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(s): satisfaction of the Entry Level Writing and Composition requirements, course 50. (General Education Code(s): W.) J. Ito, R. Mester

**102. Phonology II. F**

Advanced phonological theory. Topics include markedness; underspecification theories;

## Linguistics

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(s): course 101. J. Ito

### **105. Morphology. F**

Study of the principles of word formation: derivation, inflection, and compounding; cross-linguistic study of morphological processes, morphological investigation and analysis. Prerequisite(s): course 111 or 112, and course 101. Offered in alternate academic years. The Staff

### **108. Poetry and Language. S**

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(s): course 101, and course 111 or 112. Offered in alternate academic years. (General Education Code(s): TA.) P. Anand

### **111. Syntactic Structures. S**

Provides a basic introduction to the methods and results of generative grammar. It simultaneously provides an overview of the major syntactic constructions of English. (Formerly course 55.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. (General Education Code(s): IH.) S. Chung

### **112. Syntax I. F,W**

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.

(Formerly course 52.)

Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. (General Education Code(s): IH.) J. McCloskey, S. Chung

### **113. Syntax II. S**

Further aspects of English syntax; universal and language-particular constraints on syntactic structures and rules. Further developments and extensions of generative theory. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, course 53 and 112. (General Education Code(s): W.) J. Hankamer

### **114A. Syntax III. F**

Advanced topics in syntax and semantics. Prerequisite(s): course 113, satisfaction of the Entry Level Writing and Composition requirements and permission of instructor. (General Education Code(s): W.) J. Hankamer

### **114B. Readings in Syntax. \***

Introduces reading the primary literature in syntax. Readings will vary. Emphasis is on how to read technically difficult works, evaluate arguments, and appreciate competing views. Coursework includes readings, presentations, and short response papers. Enrollment by permission of instructor. Prerequisite: course 113. The Staff

### **114C. Topics in Syntax. \***

Advanced undergraduate course devoted to a topic in syntax. Topics vary and may include ellipsis, binding, agreement phenomena, alternative frameworks. Coursework includes problem sets, readings, presentations, and a term paper. Enrollment by permission of instructor. Prerequisite: course 113. The Staff

### **116. Semantics II. W**

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(s): course 53, and either course 111 or 112. A. Brasoveanu

### **117. Pragmatics. F**

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(s): course 53. The Staff

### **118. Semantics III. \***

Uses the tools learned in courses 53 and 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): course 116 and permission of instructor. Enrollment limited to 25. The Staff

### **120. Structure of English. \***

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(s): course 111 or 112, and 101. The Staff

### **124. Language Typology. S**

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

## Linguistics

structure, word order, evidentiality), and how it might be explained. Prerequisite(s): course 111 or 112, and course 101. Enrollment limited to 40. M. Toosarvandani

### **125. Foundations of Linguistic Theory. \***

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(s): course 113 or 116. Enrollment limited to 25. The Staff

### **127. History of Linguistics. \***

Topics in the history of linguistics, with a special focus on the 20th century. Prerequisite(s): course 101, and course 111 or course 112. The Staff

### **140. Language Change. \***

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(s): course 102. Enrollment limited to 25. The Staff

### **141. Ellipsis. \***

An 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(s): courses 53 and 101, and 111 or 112 The Staff

### **144. Computational Methods for Linguists. \***

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(s): courses 50, 53, and either 111 or 112. Enrollment is restricted to linguistics and language studies majors. (General Education Code(s): PR-E.) The Staff

### **145. Native Languages of North America. \***

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(s): course 101, and either course 111 or 112. The Staff

### **147. Quantitative Methods in Linguistics. \***

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(s): courses 53 and 101, and either course 111 or 112. (General Education Code(s): SR.) The Staff

### **151. Phonetic Analysis. W**

Introduction to instrumental phonetic analysis—analysis using experimental methods. Emphasis is on the acoustics and perception of speech. Prerequisite(s): course 101. G. McGuire

### **152. Applied Phonetics. \***

Examines areas in which phonetic analysis and experimentation are used in practice. Emphasizes problem-solving, experiments, and analytical tasks. Prerequisite(s): course 151. Enrollment limited to 25. The Staff

### **154. Language and Social Identity. S**

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(s): course 101, and either course 111 or 112. G. McGuire

### **155. Language and Cognition. \***

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(s): course 111 or 112, 53, and 101. The Staff

### **157. Psycholinguistics and Linguistic Theory. \***

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 course 257. Prerequisite(s): course 102 or 105 or 113 or 116. Enrollment restricted to linguistics and language studies majors. (General Education Code(s): SR.) The Staff

### **158. Advanced Psycholinguistics. \***

Advanced topics in psycholinguistics and experimental linguistics, contemporary memory models, computational models of comprehension and production, and neurolinguistic findings and methodologies. Student work

## Linguistics

revolves around an extended research project in which students learn to apply advanced analytical techniques. Prerequisite(s): course 157. Enrollment restricted to linguistics and language studies majors. Enrollment limited to 12. The Staff

**160. Language Engineering. \***  
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. The Staff

**181. Structure of Romance Languages. W**  
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(s): course 111 or 112, and course 101. D. Farkas

**182. Structure of Spanish. \***  
The phonology and syntax of Spanish, studied from a modern linguistic perspective. Some knowledge of Spanish is required. Prerequisite(s): course 111 or 112, and course 101. The Staff

**183. Structure of French. \***  
The phonology, morphology, and syntax aspects of French. Some knowledge of French is helpful. Prerequisite(s): course 111 or 112, and 101. The Staff

**185. Structure of Russian. \***  
The phonology, morphology, and syntax of Russian. Some knowledge of Russian is helpful. Prerequisite(s): course 111 or 112, and course 101. Enrollment limited to 30. Offered in alternate academic years. The Staff

**186. Structure of German. \***  
Phonological, morphological, and syntactic aspects of the structure of the German language. Some knowledge of German is required. Prerequisite(s): course 111 or 112, and course 101. The Staff

**187. Structure of Japanese. \***  
The phonology, morphology, and syntax of Japanese. Some knowledge of Japanese is required. Prerequisite(s): course 111 or 112, and course 101. Offered in alternate academic years. The Staff

**188. Structure of Turkish. \***  
The phonology, morphology, and syntax of Turkish. Prerequisite(s): course 111 or 112, and course 101. The Staff

**189. Structure of Arabic. \***  
The phonology, morphology, and syntax of Arabic. (Mainly modern standard, but also some regional dialects.) No knowledge of Arabic is required. Pre-requisite(s): course 101, and course 111 or 112. The Staff

**193. Field Study. \***  
Students submit petition to sponsoring agency. The Staff

**195. Senior Thesis. F,W,S**  
Deadline for submission of thesis proposal is one year in advance of proposed completion. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**198. Independent Field Study. F,W,S**  
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. May be repeated for credit. The Staff

**199. Tutorial. F,W,S**  
Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S**  
Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## GRADUATE COURSES

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**211. Phonology A. F**  
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. Enrollment restricted to graduate standing or consent of instructor. R. Mester

**212. Phonology B. W**  
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;

## Linguistics

segmental and suprasegmental processes. Prerequisite(s): course 211. Enrollment restricted to graduate standing or consent of instructor. J. Ito

### **214. Phonetics. W**

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. Enrollment restricted to graduate students, or by permission of instructor. Enrollment limited to 12. G. McGuire

### **216. Phonology Proseminar. \***

One or more topics in phonological theory. Topics vary from year to year, covering literature and current research in phonology. Prerequisite(s): course 212. Enrollment restricted to graduate standing or consent of instructor. May be repeated for credit. The Staff

### **219. Phonology Seminar. F**

Advanced topics in phonology drawn from the current research interests of the instructor. Prerequisite(s): course 212. Enrollment restricted to graduate standing or consent of instructor. May be repeated for credit. J. Padgett

### **219G. Phonology Seminar (3 credits). F**

Advanced topics in phonology drawn from the current research interests of the instructor. Three-credit version of course 219. Does not require a final paper. Prerequisite(s): course 212. Enrollment restricted to graduate students. Enrollment limited to 12. May be repeated for credit. J. Padgett

### **221. Syntax A. F**

Introduction to syntactic theory. Phrase structure; subcategorization; lexical entries; passive; infinitival constructions. Enrollment restricted to graduate standing or consent of instructor. J. McCloskey

### **222. Syntax B. W**

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(s): course 221. Enrollment restricted to graduate standing or consent of instructor. M. Toosarvandani

### **226. Proseminar in Syntax. \***

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(s): course 222. The Staff

### **226G. Proseminar in Syntax (3 credits). \***

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 course 226. Does not require a final paper. Prerequisite(s): course 222. Enrollment restricted to graduate students. Enrollment limited to 12. May be repeated for credit. The Staff

### **229. Syntax Seminar. W**

Advanced topics in syntax drawn from the current research interests of the instructor. Prerequisite(s): course 222. Enrollment restricted to

graduate standing or consent of instructor. May be repeated for credit. J. McCloskey

### **229G. Syntax Seminar (3 credits). W**

Advanced topics in syntax drawn from the current research interests of the instructor. Three-credit version of course 229. Does not require a final paper. Prerequisite(s): course 222. Enrollment restricted to graduate students. Enrollment limited to 12. May be repeated for credit. J. McCloskey

### **231. Semantics A. F**

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. Enrollment restricted to graduate standing or consent of instructor. P. Anand

### **232. Semantics B. S**

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(s): course 231. Enrollment restricted to graduate standing or consent of instructor. A. Brasoveanu

### **236. Proseminar in Semantics. \***

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(s): course 231. Enrollment restricted to graduate standing or consent of instructor. The Staff

## Linguistics

### **236G. Semantics Proseminar (3 credits). \***

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 course 236. Does not require a final paper. Prerequisite(s): course 231. Enrollment restricted to graduate students, or by consent of instructor. Enrollment limited to 12. May be repeated for credit. The Staff

### **239. Semantics Seminar. S**

Advanced topics in semantics drawn from the current research interests of the instructor. Prerequisite(s): course 232. Enrollment restricted to graduate standing or consent of instructor. May be repeated for credit. W. Ladusaw

### **239G. Semantics Seminar (3 credits). S**

Advanced topics in semantics drawn from the current research interests of the instructor. Three-credit version of course 239. Does not require a final paper. Prerequisite(s): course 232. Enrollment restricted to graduate students. Enrollment limited to 12. May be repeated for credit. W. Ladusaw

### **240. The Pedagogy of Linguistics (1 credit). F,W**

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. May be repeated for credit. P. Anand

### **244. Computational Methods for Linguists. \***

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. Enrollment restricted to graduate students, or by consent of the instructor. Enrollment limited to 12. The Staff

### **245. Computational Models of Discourse and Dialogue. W**

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. (Formerly Computer Science 245.) (Also offered as Computational Media 245. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. Undergraduates may enroll with permission of instructor. May be repeated for credit. The Staff

### **249. Morphology Seminar. F**

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. Enrollment restricted to graduate students. J. Hankamer

### **249G. Morphology Seminar (3 credits). F**

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 course 249. Does not require a final paper. Enrollment restricted to graduate students. Enrollment limited to 12. May be repeated for credit. J. Hankamer

### **257. Psycholinguistics and Linguistic Theory. \***

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 course 157 or 257G. Enrollment restricted to graduate students. The Staff

### **258. Advanced Psycholinguistics. S**

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 course 258G. Prerequisite(s): course 257. Enrollment restricted to graduate students. M. Wagers

**258G. Advanced Psycholinguistics (3 credits). S**  
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 course 258. Does not require a final paper. Students cannot receive credit for this course and course 258. Prerequisite(s): course 257. Enrollment restricted to graduate students. Enrollment limited to 12. M. Wagers

**259. Phonetics Seminar. \***  
Advanced topics in acoustic and articulatory phonetics. Prerequisite(s): course 214. Enrollment restricted to graduate students. The Staff

**259G. Phonetics Seminar (3 credits). \***  
Advanced topics in acoustic and articulatory phonetics. Three-credit version of course 259. Does not require a final paper. Prerequisite(s): course 214. Enrollment restricted to graduate students. Enrollment limited to 12. May be repeated for credit. The Staff

**279. Research Seminar in Psycholinguistics. \***  
Contemporary research in psycholinguistic theory models, and methods. Topics vary with research interests of faculty and graduate students. Enrollment restricted to

graduate students, or by consent of instructor. Enrollment limited to 12. May be repeated for credit. The Staff

**280. Proseminar in Experimental Linguistics. \***  
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. Enrollment restricted to graduate students. The Staff

**280G. Proseminar in Experimental Linguistics (3 credits). F**  
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 course 280. Does not require a final paper. Enrollment restricted to graduate students. Enrollment limited to 12. M. Wagers

**282. Field Methods. S**  
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 restricted to graduate students. M. Toosarvandani

**290. Research Seminar. W**  
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 restricted to graduate standing or consent of instructor. Enrollment limited to 10. S. Chung

**295. Directed Reading. F,W,S**  
Directed reading which does not involve a term paper. Enrollment restricted to graduate standing or consent of instructor. The Staff

**296. Linguistics Colloquium (2 credits). F,W,S**  
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 restricted to linguistics graduate students. May be repeated for credit. P. Anand

**297. Independent Study. F,W,S**  
Enrollment restricted to graduate standing or consent of instructor. May be repeated for credit. The Staff

**299. Thesis Research. F,W,S**  
The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# LITERATURE

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2015-16 General Catalog

303 Humanities 1

(831) 459-4778

<http://literature.ucsc.edu/>

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## PROGRAM DESCRIPTION

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The study of literature at UCSC is organized as an interdisciplinary field coordinated through a single Department of Literature, rather than through separate departments of English, modern languages, and classics. This structure fosters innovative and comparative approaches to literature among both faculty and students. Courses in the major encompass traditional literary history and interpretation as well as cross-cultural inquiry and current theoretical debates.

The literature major permits focused work in national literary traditions. Students may concentrate in English-language literatures; in French, German, or Italian; in Latin and/or Greek; or in Spanish/Latin American/Latino literatures. Alternatively, students may organize their studies by historical period. Students who choose pre- and early modern studies focus on early literary traditions from antiquity through the Middle Ages, the Renaissance, and the neo-classical period, while those engaged in modern literary studies concentrate on literature of the 18th, 19th, 20th, and 21st centuries. In addition, the world literature and cultural studies concentration emphasizes non-Western literatures, literature in a global context, as well as non-literary forms of cultural production. Finally, the Literature Department also offers a concentration in creative writing in which, in addition to studying literature, students work with faculty in upper-division workshops to improve their own creative writing skills. Literature majors at UCSC are trained in critical reading, writing, and thinking, as well as in literary interpretation. These skills have wide applicability: they may lead to careers in other media such as film, theater, video, the visual arts, and electronic media; and they offer avenues into related disciplines such as history, philosophy, psychology, sociology, anthropology, politics, and history of art and visual culture. Literature majors traditionally enter a wide variety of careers ranging from law and journalism to management, government, international studies, publishing, technical writing, and teaching at all levels. 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 a language other than English.

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## PROGRAM LEARNING OUTCOMES

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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 difference 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.
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## LETTER GRADE REQUIREMENT

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Letter grades are required for 75 percent of courses applied toward the literature major, including the senior seminar or thesis, which must be taken for a letter grade.

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## DECLARATION OF THE MAJOR OR MINOR

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Students must complete Literature 1 or its equivalent prior to declaring the major or minor. Students declare a major or minor in literature by completing and submitting a Proposed Study Plan and Declaration of Major/Minor petition. All students considering a literature major or minor should consult with staff and/or faculty advisers 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 in their first quarter at UCSC.

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## REQUIREMENTS OF THE MAJOR LITERATURE MAJOR OPTIONS

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Students wishing to major in literature may choose either the standard literature major or the intensive literature major. The intensive literature major is recommended particularly for students who plan to continue their studies in graduate school. The requirements for the intensive major include the study of literature in two languages; advanced proficiency in a second language is therefore required.

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### THE STANDARD LITERATURE MAJOR

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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.

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### LOWER-DIVISION COURSES

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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:

- Literature 1, Literary Interpretation: close reading and analysis of literary texts. This is a writing-intensive course.
- One Literature 61-series course: categories, methodologies, and problems of literary study, or one Literature 80-series course: topical, thematic, and comparative studies of literary and filmic texts. Literature 61 and Literature 80 courses are recommended for both majors and non-majors.

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### UPPER-DIVISION COURSES

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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. Students must successfully complete the language proficiency requirement before enrolling in Literature 102.

Ten upper-division courses are required:

- Literature 101, Theory and Interpretation: approaches to literary and cultural theories
- Literature 102, Translation Theory: approaches to literary and cultural translation, or one upper-division non-English literature course studied in the original language. Students must successfully complete the language proficiency requirement before enrolling in Literature 102
- Six upper-division courses in an area of concentration (described below)
- Two upper-division electives in literature

**Distribution requirements.** Among the 10 upper-division courses, at least two must focus on literature written prior to the year 1750; one course must focus on non-Western literature or literature in a global perspective; and one course must focus on poetry. One of the upper-division courses may be a senior seminar, which can be used to satisfy the campus comprehensive (exit) requirement. Some courses fulfill more than one distribution requirement. A list of annual course offerings indicating distribution codes for each course is available in the department office and on the Literature Department web page at <http://literature.ucsc.edu/>.

With prior permission from the literature undergraduate program director, one upper-division literature elective may be replaced by an upper-division course related to the student's area of concentration and chosen from another program in the humanities, arts, or social sciences.

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### THE INTENSIVE LITERATURE MAJOR

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The Intensive Literature major requires (1) advanced proficiency in a second language, and (2) 14 courses in literature.

- **Advanced language proficiency:** in addition to the Standard Literature major requirement of one-year (three quarters or equivalent) of college-level study of a non-English language, or demonstrated reading ability at this level, students must complete at least two upper-division courses in a second-language literature studied in the original language.

## Literature

In many languages, two years of college-level study (or comparable ability) are needed before a student is prepared to enter an upper-division course. In a few languages (Greek, Latin, Middle Egyptian Hieroglyphs), less time is needed for this purpose.

- The 14 required courses must include two lower-division and 12 upper-division courses.

### LOWER-DIVISION COURSES

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The same requirements apply as for the standard literature major. Students who choose the intensive literature major are required to achieve advanced proficiency in a second-language literature. Upper-division literature coursework requires completion of a lower-division language sequence or the equivalent.

### UPPER-DIVISION COURSES

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The intensive major requires 12 upper-division courses. Distribution requirements for the intensive major are the same as those for the standard literature major. In addition, students must complete at least two courses in a second-language literature studied in the original language. As in the standard major, with prior permission from the literature undergraduate program director, one upper-division literature elective may be replaced by an upper-division course related to the student's area of concentration and chosen from another program in the humanities, arts, or social sciences.

## THE CONCENTRATIONS

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The purpose of the upper-division area of concentration is to help students shape a coherent program of study. The department provides several defined concentrations, described below. For all concentrations except national/transnational literatures, texts may be read in the original language or in translation.

### NATIONAL/TRANSNATIONAL LITERATURES

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These concentrations examine literature within the frameworks of particular languages or national and regional traditions. National/transnational concentrations require that texts be read in the original language.

- **English-language literatures**  
The study of American and British literature, as well as literatures of other English-speaking peoples around the world.
- **French literature**  
The study of French and Francophone literatures,

languages, and cultural practices of France, Africa, and the Caribbean.

- **German literature**  
The study of the literature, language, and cultural practices of the German-speaking areas of central Europe including Germany, Austria, and Switzerland.
- **Greek and Latin literature**  
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**  
The study of Italian literature, language, and cultural practices from the Middle Ages to the present.
- **Spanish/Latin American/Latino literatures**  
The study of literatures, language, and cultural practices of Spain, Latin America, and Latino populations in the United States.

## CREATIVE WRITING

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The Department of Literature offers a sequence of workshops from introductory through advanced levels in both poetry and fiction. Other activities available to interested students include participation in the production of literary journals on campus, attendance at readings by visiting writers, and use of a creative writing reading room.

Admission to this concentration is selective. Interested students are required to take one lower-division creative writing workshop at UCSC before applying to the creative writing concentration; however, students are strongly encouraged to complete two lower-division workshops (at least one at UCSC) before applying.

Students accepted into the concentration must complete three advanced writing workshops and a senior project (e.g., a group of stories, a significant portion of a novel, a collection of poems). To apply for admission to the creative writing concentration, students should submit a completed application form (available at the Literature Department office and at <http://creativewriting.ucsc.edu/for-students/apply.html>) and a thoughtful selection from their work (7–10 pages of poetry or fiction). Once accepted into the concentration, students are required to declare (or redeclare) the major in literature. At that time, students should meet with their adviser to discuss plans for a senior project.

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## PRE- AND EARLY MODERN STUDIES

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The interdisciplinary study of literatures and cultures from antiquity through the early eighteenth century, especially in Europe. This concentration includes the study of popular culture and everyday life as well as readings in masterpieces of classical, medieval, early modern (Renaissance), and neo-classical literature.

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## MODERN LITERARY STUDIES

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The study of literature of the eighteenth, nineteenth, twentieth, and twenty-first centuries. This concentration examines ways in which modernity in general and literary modernism and postmodernism in particular emerge and develop in different countries and cultures.

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## WORLD LITERATURE AND CULTURAL STUDIES

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The study of literature and cultural production both within a global context and within specific histories and economies. Courses move beyond the literary text to include nonverbal forms of representation such as social movements and everyday life practices.

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## DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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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 Literature 101.

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## COMPREHENSIVE REQUIREMENT

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Students must successfully complete Literature 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. The senior seminar need not be in the student's area of concentration. Several senior seminars are offered each quarter; extensive writing is required in all seminars.
- **Senior thesis.** A student who wishes 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 (course 195) in a literature concentration.

For students in the creative writing concentration, a creative writing project under the supervision of a faculty member (Literature/Creative Writing 194 or 195) is required.

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## THE LITERATURE MINOR

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The minor in literature requires seven courses.

Two lower-division courses are required:

- Literature 1, Literary Interpretation: close reading and analysis of literary texts. This is a writing-intensive course.
- One Literature 61-series course: categories, methodologies, and problems of literary study, or one Literature 80-series course: topical, thematic, and comparative studies of literary and filmic texts. Literature 61 and Literature 80 courses are recommended for both Literature minors and non-majors.

Five upper-division courses are required:

- Literature 101, Theory and Interpretation
- Four other upper-division literature courses (except Creative Writing)

The Literature minor does not require second-language proficiency or a senior seminar.

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## GENERAL INFORMATION

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### TRANSFER CREDIT

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A student may petition to receive credit toward the lower-division requirements of the major or minor for up to two courses taken at other institutions. An introduction to literature course may be used to satisfy the Literature 1 course requirement. Any other literature course may be applied toward the Literature 61 or the Literature 80 course requirement.

Transfer students planning to major in literature are urged to complete the equivalent of one year of college-level study of a language other than English before entering UCSC.

### CREATIVE WRITING COURSES

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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 180, 183, 194, and 195 to satisfy major requirements.

## Literature

### CREDIT FOR REPEATED COURSES

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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 UCSC General Catalog.

### ADVISING

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Faculty advisers are available in the Literature Department office throughout each academic term; students may make appointments in advance to meet with them. Staff advisers are available by appointment and on a drop-in basis. Students are encouraged to consult with a faculty adviser once per quarter.

### SENIOR CHECKLIST

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Three quarters before anticipated graduation, all literature majors must complete a checklist in collaboration with a department adviser. 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.

### HONORS

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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.

### OPPORTUNITIES FOR STUDY ABROAD

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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 over 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.

## THE GRADUATE PROGRAMS

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### THE DOCTORAL PROGRAM

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The UCSC doctoral program in Literature offers an innovative multilingual and multidisciplinary approach to literary studies. 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 multilingual and global perspectives. Students work within and across five areas, each of which cuts across linguistic, national, and period boundaries: technologies of narrative; trans/post/emergent nationalisms; poetics, poetry, and experimental writing; materialism and material culture; and critical theory. In combination they allow students to blend critical approaches, literary traditions, and/or cultural archives in comparative, multilingual, and interdisciplinary projects. Students may also apply for the Creative/Critical concentration in the Ph.D. program. Students may apply for a designated emphasis on the literature doctoral diploma in programs such as Critical Race and Ethnic Studies, Feminist Studies, History of Consciousness, Latin American and Latino Studies, and Politics. Applications and requirements are available at the respective department offices.

The program requires significant literary work in two languages. All students are required to complete a minimum of two 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.

The common requirements are:

- Literature 200, Proseminar, to be taken in fall quarter of the first year;
- Literature 201, Pedagogy of Teaching/Teaching Assistant Training, to be taken prior to or in conjunction with the first teaching assistant appointment;
- Twelve 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-1750 literature and culture. Up to four courses may be taken in other departments; up to three may be independent studies;
- Literature 291F, a two-credit advising course, each quarter;
- Three quarters of supervised teaching experience;
- The Literature Department's intensive three-week Graduate Summer Language Program or equivalent;
- A qualifying examination consisting 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. The qualifying examination must be

## Literature

taken during the third year or first quarter of the fourth year.

- A prospectus outlining and defining the dissertation project. The prospectus identifies the research problem, methodologies, and case studies, with chapter outline, footnotes, and bibliography, and must be submitted within a quarter following the qualifying examination, but no later than the end of the fourth year.
- A dissertation (written in conjunction with Literature 299, Thesis Research).

For the creative/critical concentration, applicants submit additional creative writing samples of poetry, prose fiction, creative non-fiction or hybrid/cross genre. Entering students complete all the requirements for the literature Ph.D. with the addition of a creative/critical enhancement to their degree in the form of coursework, original creative work with critical introduction and, if desired, work in poetics, translation, form and/or critical writing from the perspective of writerly practices.

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 adviser.

More 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 (<http://graddiv.ucsc.edu>) and on the department web site: <http://literature.ucsc.edu/>.

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### THE MASTER'S PROGRAM

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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 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.

The common requirements are as follows:

- Literature 200, Proseminar, to be taken in fall quarter of the first year;

- Seven 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;
- Literature 291F, a two-credit advising course, each quarter;
- A thesis (written in conjunction with Literature 299, Thesis Research). Typically, a thesis will range in length from 35–50 pages, plus a bibliography.

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 (<http://graddiv.ucsc.edu>) and on the department web site (<http://literature.ucsc.edu/>).

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### LITERATURE DESIGNATED EMPHASIS

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Graduate students in other programs may obtain a designated emphasis in literature on the Ph.D. degree by completing the following requirements:

1. The student must have a faculty graduate adviser from Literature, who serves both on the qualifying examination committee and the dissertation reading committee.
2. 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.
3. 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.
4. When the above requirements have been fulfilled, the formal steps to obtain the Designated Emphasis in Literature are:
  - The student should complete the Designated Emphasis Application form (<http://literature.ucsc.edu/graduate/LITDesignatedEmphasisApp.pdf>), 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.

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## LITERATURE FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**Jorge Aladro Font**

Spanish mysticism; theory and historical developments of imagery in the Middle Ages to the baroque period; Renaissance and baroque Hispanic literature; Italian ideas in the Spanish Renaissance; Cervantes

**Karen Bassi**

Greek and Latin literatures; gender; literary and cultural theory; pre- and early modern studies; tragedy; historiography; visual and performance studies; death studies

**Christopher Connery**

World literature and cultural studies; globalism and geographical thought; the 1960s; Marxism; pre-modern and modern Chinese cultural studies; cultural revolution

**Carla Freccero**

Renaissance studies; French and Italian language and literature; early modern studies; postcolonial theories and literature; contemporary feminist theories and politics; queer theory; U.S. popular culture; posthumanism; animal studies

**Susan Gillman**

Transnational American studies; literatures of the 19th-century Americas; critical race studies; translation theory; comparative history of slavery and emancipation; world literature and cultural studies

**Wlad Godzich**

Theory of literature; philosophy and literature; emergent literature; translation theory; globalization and culture; European integration; knowledge society; literatures of Africa, the Caribbean, Europe (Central, Eastern, and Western), Brazil, Canada; detective and crime fiction; science fiction; medicine and literature

**Jody Greene**

Seventeenth- and 18th-century British literature and culture; pre- and early modern studies; critical theory, especially Derrida; poststructuralism and ethics; gender studies; history of authorship; history of the book; human property

**Kirsten Silva Gruesz**

Transnational Americas studies; Chicano/Latino literatures and cultures; 19th-century U.S. and Latin American literature; poetry; history of the book; reading and literacy; bilingualism

**Sharon Kinoshita**

Mediterranean studies; medieval Francophone and Mediterranean literature; literature, translation, and empire; postcolonial and globalization theory; Marco Polo; world literature and cultural studies

**Kimberly J. Lau**

Feminist theory; fairy tale studies; virtual worlds; social fictions; discourse analysis and ethnographic methods

**H. Marshall Leicester, Jr.**

Psychoanalysis; poststructuralism; gender theories; theory of cultural change; cultural studies and popular culture: opera, film, American country music; history, theory, and interpretation of horror film; affect and affect theory

**Tyrus Miller**

Modernist, avant-garde, and postmodernist literature; the interrelations of the arts in the 20th century; aesthetics theory; communist and post-communist society, intellectual history, and culture, especially in East-Central and Southern Europe; cinema and film theory; the Frankfurt School; György Lukács; contemporary poetry and language arts

**Micah Perks**

Reading and writing contemporary fiction, creative non-fiction and historical fiction; U.S. alternative communities; feminism

**Juan Poblete**

Latin(o) American literatures; transnational/global cultures (literature, radio, film); Latin(o) American cultural studies; 19th-century studies; the history of reading practices

**Daniel Selden**

Afroasiatic languages and literatures; Greek and Latin; Hellenistic culture; the classical tradition; history of criticism; literary theory; film history, theory, and analysis

**Deanna Shemek**

Renaissance Italian literature and culture; early modern feminism; humanism; letter-writing and epistolary culture; early modern literacy and media; Renaissance theater; the northern court circles; digital humanities

**Rob Wilson**

Transnational and postcolonial literatures, especially as located and transformed in Asia/Pacific; cultural-political emergences as posited against empires of

## Literature

globalization; cultural poetics of America in the Pacific and Oceania; the sublime, Longinus to Hiroshima; poetics of experimental writing, especially poetry; the poetry and cultural poetics of Bob Dylan; Beat beatitude, social and literary, from Jesus to Juliana Spahr et al; San Francisco as Global City, with its literature read as archive of vision and critique; Pacific Rim cities from Hong Kong and Seoul to Taipei, Kaohsiung, Shanghai, Honolulu, San Francisco, and Los Angeles

### **Karen Tei Yamashita**

History and anthropology of Japanese immigration to Brazil; Asian American literature; modern fiction; playwriting

ASSOCIATE PROFESSOR

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### **Dorian Bell**

Nineteenth- and 20th-century French literature and intellectual history; histories of empire and anti-Semitism; literature and science; film studies; digital humanities

### **A. Hunter Bivens**

Twentieth- and 21st-century German literature and film; Marxism and critical theory; psychoanalysis; lyric poetry; literary realism; the novel

### **Vilashini Cooppan**

Postcolonial studies; comparative and world literature; literatures of slavery and diaspora; globalization studies; cultural theory of race and ethnicity

### **Sean Keilen**

Shakespeare; Ovid; the classical tradition; early British literature; Renaissance humanism; poetry and poetics, imitation; theory of literature; interpretation and its history; the division of the arts and sciences; creative criticism; literature and the fine arts; literature and ethics; psychoanalysis; the passions; the senses; beauty

### **Loisa Nygaard**

Eighteenth- and early 19th-century German literature; Goethe; Romantic fiction; landscape and landscape aesthetics; xenophobia in Germany

### **Ronaldo V. Wilson**

20th-century and contemporary African American literature; poetry; contemporary American poetry and poetics; Black visual culture; recent experimental writers and artists

ASSISTANT PROFESSOR

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### **Christopher Chen**

Twentieth- and 21st-century African American literature; Asian American literature; comparative ethnic literary studies; modern and contemporary US poetry and poetics; contemporary U.S. experimental

writing; racial capitalism and theories of comparative racialization

### **Martin Devecka**

Greek and Latin languages and literatures; cultural history; Arabic language and literature; animal studies; history of technology; Renaissance studies

### **Renee Fox**

Victorian literature and culture; 19th-21st-century Irish studies; the gothic; poetry; Neo-Victorian fiction and adaptation; history of science; queer theory

### **Camilo Gomez-Rivas**

Medieval and Mediterranean studies; western Mediterranean historical and cultural studies; refugees, law and society, and religious identity; Arabic literature and cultural history; medieval Iberian literature and culture

### **Christine Hong**

Asian American literature and cultural criticism; African American literature and black freedom studies; Korean diasporic cultural production; Pacific Rim studies; postcolonial theory; critical race theory; human rights discourse; law and literature; narrative theory; film and visual studies

### **G.S. Sahota**

Postcolonial studies, world literature; Indian literary and intellectual history (especially in Urdu, Sanskrit, Punjabi, Hindi, and English); religion and modernity (Islam, Hinduism, Sikhism); romanticism; Marxism; translation

LITERATURE EMERITI FACULTY

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**George T. Amis, Emeritus**

**Murray Baumgarten, Emeritus**

**Harry Berger, Jr., Emeritus**

**Margaret R. Brose, Emerita**

**Julianne Burton-Carvajal, Emerita**

**John M. Ellis, Emeritus**

**Pascale Gaitet, Emerita**

**Mary-Kay Gamel, Emerita**

**Margo Hendricks, Emerita**

**John O. Jordan, Emeritus**

**Norma Klahn, Emerita**

**John P. Lynch, Emeritus**

**Nathaniel E. Mackey, Emeritus**

**Helene Moglen, Emerita**

**Madeline Moore, Emerita**

**Priscilla W. Shaw, Emerita**

**Paul N. Skenazy, Emeritus**

**S. Page Stegner, Emeritus**  
**Richard Terdiman, Emeritus**  
**Thomas A. Vogler, Emeritus**  
**Michael J. Warren, Emeritus**



PROFESSOR

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**Charles W. Hedrick Jr. (History)**  
Greek and Roman history; epigraphy; historiography;  
political theory

**Lourdes Martinez-Echazabal (Latin American and Latino Studies)**

Latin American and Caribbean literatures; Afro-Latin American literatuers, cultures, and societies; found[n]ational narratives; Brazilian literature; literatuers of Cuba and the Cuban diaspora, cinema and social change in Cuba; critical race theory, queer literature and cinema in Latin America

ASSOCIATE PROFESSOR

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**Anjali Arondekar (Feminist Studies)**

South Asian studies, colonial historiography; feminist theories; queer theory; critical race studies; 19th-century interdisciplinary studies

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## LITERATURE

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### LOWER-DIVISION COURSES

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**1. Literary Interpretation. F,S**

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(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to first-year students and sophomores, or literature and proposed literature majors and literature minors. (General Education Code(s): TA, IH, W.) (F) D. Shemek, (S) V. Cooppan

**42. Student-Directed Seminar. \***

Seminars taught by upper-division students under faculty supervision. (See course 192.) The Staff

**61. Introduction to Literary Genres.**

**61F. Introduction to Reading Fiction. F**

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. May be repeated for credit. (General Education Code(s): TA, IH.) W. Godzich

**61H. Introduction to Film Analysis. \***

Introduces techniques for the close reading of film, with particular attention to film form (shot-by-shot analysis), cinematic codes, narrative structure, and the ideological burdens of the basic cinematic apparatus. Case studies of select works by major directors from the Hollywood studio period. (General Education Code(s): IM, IH.) The Staff

**61J. Introduction to Jewish Literature and Culture. W**

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. (General Education Code(s): ER, IH, E.) B. Thompson

**61K. Introduction to the Fairy Tale. \***

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. (General Education Code(s): TA.) K. Lau

**61L. True Stories: Memoir. F**

Historical overview of the genre from Augustine to contemporary experiments in memoir. Student write weekly creative-critical responses and a final creative-critical paper. (General Education Code(s): PR-C.) M. Perks

**61M. Approaches to Classical Myth. W**

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. (General Education Code(s): TA, IH.) K. Bassi

## Literature

### **61P. Introduction to Reading Poetry. \***

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 Schedule of Classes for the current topic. (General Education Code(s): TA, IH.) C. Chen

### **61R. Race in Literature. \***

An investigation into the various uses and abuses of "race" in literature. Course topic changes; see the Schedule of Classes for current topic. (General Education Code(s): ER, IH, E.) C. Hong

### **61W. Writing and Research Methods. F**

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 course 1 or its equivalent. (General Education Code(s): IH, W.) The Staff

### **80. Topics in Literature.**

#### **80D. Literary Traditions of India. S**

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. May be repeated for credit. (General Education Code(s): CC.) G. Sahota

### **80E. Animals and Literature. \***

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. (General Education Code(s): TA.) C. Freccero

### **80I. Topics in American Culture. \***

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. May be repeated for credit. (General Education Code(s): T4-Humanities and Arts.) The Staff

### **80L. The Holocaust: The Destruction of European Jewry. \***

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. (General Education Code(s): ER, T4-Humanities and Arts, E.) M. Baumgarten, P. Kenez

### **80N. Latino Expressions in the U.S. \***

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. (General Education Code(s): ER, T4-Humanities and Arts, E.) K. Gruesz

### **80V. Literature and History. \***

Examines literature's relationship to the past and to the experience of history. Course topic changes; please see the Schedule of Classes for current topic. (General Education Code(s): TA, T4-Humanities and Arts.) A. Bivens

### **80Z. Introduction to Shakespeare. F**

Study of representative plays. No previous experience with Shakespeare is assumed. (General Education Code(s): TA, T4-Humanities and Arts.) A. Heald

### **99. Tutorial. F,W,S**

The Staff

### **99F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. The Staff

## UPPER-DIVISION COURSES

### **101. Theory and Interpretation. W,S**

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 Schedule of Classes for current topic. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to literature and proposed literature majors and literature minors. May be repeated for credit. (General Education Code(s): W.) (W) J. Greene, (S) W. Godzich

### **102. Translation Theory. W**

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(s): one year of college-level, non-English language study or the equivalent reading ability in a non-English language. (General Education Code(s): TA.) S. Kinoshita

## Literature

### **191. Methodologies of Teaching (3 credits). \***

This 3-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. (General Education Code(s): PR-S.) The Staff

### **199F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. The Staff

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## GRADUATE COURSES

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### **200. Proseminar. F**

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. Enrollment restricted to graduate students. S. Gillman

### **201. The Pedagogy of Literature (1 credit). F**

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. Enrollment restricted to graduate students. May be repeated for credit. S. Gillman

### **202. Colloquium (2 credits). F,W,S**

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. May be repeated for credit. The Staff

### **204. Readings in Literature (2 credits). \***

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. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **291F. Advising (2 credits). F,W,S**

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. May be repeated for credit. The Staff

### **297. Independent Study. F,W,S**

Independent Study. The Staff

### **297F. Independent Study (2 credits). F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

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## CREATIVE WRITING

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### LOWER-DIVISION COURSES

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#### **10. Introduction to Creative Writing. F,W,S**

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: satisfaction of the Entry Level Writing requirement. Enrollment restricted to first-year students, sophomores, and juniors. May be repeated for credit. (General Education Code(s): PR-C, A.) The Staff

#### **52. Intermediate Fiction Writing. F,W,S**

An intermediate-level course in fiction designed for prospective creative writing majors. Prerequisite(s): submission of writing at first class meeting. May be repeated for credit. (General Education Code(s): PR-C, A.) (F) K. Yamashita, (WS) The Staff

#### **53. Intermediate Poetry Writing. F,W,S**

An intermediate-level course in poetry designed for prospective creative writing majors. Prerequisite(s): course 10. May be repeated for credit. (General Education Code(s): PR-C, A.) (F) G. Young, (W) C. Chen, (S) R. J. Wilson

#### **99F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. The Staff

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### UPPER-DIVISION COURSES

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#### **170. Methods and Materials. S**

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 Schedule of Classes for current topic. Satisfies the Creative Writing Literature concentration. Enrollment restricted to creative writing literature majors. May be repeated for credit. (General Education Code(s): PR-C, A.) G. Young

## Literature

### **180. Advanced Writing: Fiction. F,W,S**

Intensive work in writing fiction. Satisfies the Creative Writing Literature concentration.

Enrollment restricted to creative writing literature majors. May be repeated for credit. (General Education Code(s): PR-C, A.) (F) K. Yamashita, (WS) M. Sanders-Self

### **183. Advanced Writing: Poetry. F,W**

Intensive work in writing poetry. Satisfies the Creative Writing Literature concentration.

Enrollment restricted to creative writing literature majors. May be repeated for credit. (General Education Code(s): A.) (F) R. V. Wilson, (W) G. Young

### **192. Directed Student Teaching. F,W,S**

Teaching of a lower-division seminar under faculty supervision. (See course 42.) The Staff

### **194. Creative Project Seminar.**

Seminar offered to senior literature majors in the creative writing concentration as a way to satisfy the senior exit requirement. All students are required to complete a creative writing project of significant length as part of the seminar coursework. Attention is given to focusing of creative topics,

review of work in progress, work rhythms, and revision.

Prerequisite(s): Literature 101. The Staff

### **194A. Poetry Senior Seminar. S**

Satisfies the Creative Writing Literature concentration; also satisfies the senior seminar distribution requirement. Prerequisite(s): Literature 101. Enrollment restricted to senior creative writing literature majors. R. V. Wilson

### **194B. Fiction Senior Seminar. S**

Satisfies the Creative Writing Literature concentration; also satisfies the senior seminar distribution requirement. Prerequisite(s): Literature 101. Enrollment restricted to senior creative writing literature majors. M. Perks

### **195. Senior Essay. F,W,S**

Satisfies the Creative Writing Literature concentration; also satisfies the Creative Writing senior exit distribution requirement. Prerequisite(s): Literature 101. Students submit petition to sponsoring agency. Enrollment restricted to senior creative writing literature majors. The Staff

### **198. Group Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## GRADUATE COURSES

### **270. Methods and Materials. W**

A combined seminar and creative-writing workshop with a concentrated focus on a particular problem, aspect, or genre of poetry or prose writing, this course includes reading and analysis of selected texts with critical responses and creative writing. The course topic changes; please see the Schedule of Classes for the current topic. Enrollment is restricted to graduate students. May be repeated for credit. M. Perks

### **271. Writing Workshop. F**

In this graduate-level, multi-genre, workshop-based course, students develop their own creative projects of publishable quality under the guidance of the instructor. Enrollment is restricted to graduate students in the creative writing concentration or by permission of the instructor. May be repeated for credit. R. V. Wilson

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## ENGLISH-LANGUAGE LITERATURES

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### UPPER-DIVISION COURSES

### **102. Canons.**

#### **102A. The Traditional British Canon, Part I. \***

The constitution of the "canon" of English literature from Chaucer to Cowper. Satisfies the English and Pre- and Early Modern Studies Literature concentrations; also satisfies the Poetry and Pre- and

Early Modern distribution requirements. (General Education Code(s): TA.) J. Greene

#### **102B. The Traditional British Canon, Part II. \***

Explores poetry and prose from 1800 to 1950 through extensive reading in the Romantics, Victorians, Moderns, articulating the connections among them,

connecting their work to key social, political, scientific, and technological moments defining these eras. Satisfies the English and Modern Literary Studies concentrations; also satisfies the Poetry distribution requirement. The Staff

**102D. The Traditional U.S. Canon, 1900 to the Present. \***

Major works from 1900 to the present, with attention to their social and cultural context. Satisfies the English and Modern Literary Studies concentrations. C. Chen

**103. Periods and Movements.**

**103E. Studies in Romanticism. \***

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. Satisfies the English and Modern Literary Studies concentrations; also satisfies the Poetry distribution requirement. (General Education Code(s): TA.) H. Leicester

**103F. Survey of Victorian Literature. F**

A survey of British Victorian literature (1830-1901) featuring representative texts and authors from Tennyson to Oscar Wilde. Readings include poetry, drama, novels, and nonfiction prose. Satisfies the English, and Modern Literary Studies concentrations. R. Fox

**103J. Contemporary American Literature. \***

A selective examination of major writings since World War II, with attention to both literary issues and historical context. Satisfies the English and Modern Literary Studies concentrations. May be repeated for credit. The Staff

**110. Prose.**

**110A. Studies in the English Novel. \***

From the 18th to the 20th century. Texts include work by Fielding, Austen, Bronte, Dickens, Conrad, and Woolf. Satisfies the English and Modern Literary Studies

concentrations. (General Education Code(s): TA.) The Staff

**110B. The 18th-Century English Novel. \***

The 18th-century novel from Defoe to Austen. Satisfies the English and Pre- and Early Modern Literature concentrations; also satisfies the Pre- and Early Modern distribution requirement. J. Greene

**110C. The 19th-Century English Novel. \***

The 19th-century novel: Austen to Bronte. Satisfies the English and Modern Literary Studies concentrations. The Staff

**110D. The 19th- and 20th-Century English Novel. \***

The 19th- and 20th-century novel: Hardy to Joyce. The course topic changes; please see the Class Search for current topic. Satisfies the English and Modern Literary Studies concentrations. The Staff

**110E. Victorian Prose. \***

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. Satisfies the English and Modern Literary Studies concentrations. The Staff

**110F. Nineteenth-Century American Fiction. S**

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. Satisfies the English and Modern Literary Studies concentrations. (General Education Code(s): TA.) K. Gruesz

**120. Poetry.**

**120A. Poetry of the 17th Century. \***

Readings in the works of Donne, Jonson, Herbert, Herrick, Marvell, and others. Satisfies the English and Pre- and Early Modern Studies Literature concentrations; also satisfies the Poetry and Pre- and Early Modern distribution requirements. (General Education Code(s): TA.) J. Greene

**120B. Victorian Poetry. \***

A reading of the major Victorian poets from Tennyson to early Yeats. Satisfies the English and Modern Literary Studies concentrations; also satisfies the Poetry distribution requirement. (General Education Code(s): TA.) The Staff

**120C. Nineteenth-Century American Poetry. \***

The major figures and important movements from Poe to Emerson through Whitman and Dickinson. Satisfies the English and Modern Literary Studies concentrations; also satisfies the Poetry distribution requirement. K. Gruesz

**120F. American Poetry Since World War II. W**

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. Satisfies the English and Modern Literary Studies concentrations; also satisfies the Poetry distribution requirement. May be repeated for credit. C. Chen

**120H. Beat Literature and the World. F**

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. Satisfies the English

## Literature

and Modern Literary Studies concentration; also satisfies the Poetry distribution requirement. (General Education Code(s): TA.) R. Wilson

### **120L. Topics in Poetry. F**

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. Satisfies the English concentration; also satisfies the Poetry distribution requirement. May be repeated for credit. (General Education Code(s): TA.) L. Shufan

### **140. Visual Media/Popular Culture.**

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#### **140C. The Films of John Carpenter. \***

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. Satisfies the English and Modern literature concentrations. H. Leicester

### **150. Ethnic Writing.**

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#### **150A. African-American Literature. F**

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. Satisfies the English and Modern Literary Studies concentrations. (Formerly Afro-American Literature.) May be repeated for credit. (General Education Code(s): ER, E.) C. Chen

#### **150C. Asian American Literature. W**

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. Satisfies the English and Modern Literary Studies concentrations. (General Education Code(s): ER, E.) K. Yamashita

#### **150E. American Indian Literature. \***

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. Satisfies the English and Modern Literary Studies concentrations. (General Education Code(s): E.) The Staff

#### **150F. African-American Women Writers. \***

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. Satisfies the English Language and Modern Literary Studies concentrations. (General Education Code(s): ER, E.) C. Chen

### **155. Regional Writing.**

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#### **155B. Regions in American Literature. W**

Examines development of regional writing in the U.S. Course topic changes; see the Class Search for current topic. Satisfies the English and Modern Literary Studies concentrations. May be repeated for credit. R. Wilson

### **160. Transnational Writing.**

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#### **160B. Empire and After in the Anglophone Novel. S**

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. Satisfies the English and Modern Literary Studies concentrations. May be repeated for credit. V. Cooppan

#### **160C. Postcolonial Writing. \***

Introduces students to a selection of postcolonial theory and texts. Satisfies the English and Modern Literary Studies concentrations. May be repeated for credit. The Staff

#### **160F. Contemporary Transnational Literatures. \***

Examines contemporary cultural production, including literature, music, and film, with close attention to social and political issues. Course topic changes; please see the Class Search for current topic. Satisfies the English, Modern Literary Studies, and World Literature concentrations; also satisfies the Global distribution requirement. May be repeated for credit. (General Education Code(s): CC.) The Staff

### **170. Individual Authors.**

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#### **170A. Geoffrey Chaucer. F**

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. Satisfies the English and Pre- and Early Modern Studies Literature concentrations; also satisfies the Poetry and Pre- and Early Modern distribution requirements. (General Education Code(s): TA.) H. Leicester

**170B. Edmund Spenser. \***

Studies in Spenser's major poetry: Faerie Queene, Book I; Epithalamion; Mutabilitie Cantos. Satisfies the English and Pre- and Early Modern Studies Literature concentrations; also satisfies the Poetry and Pre- and Early Modern distribution requirements. H. Leicester

**170C. William Shakespeare. S**

Study of representative works by William Shakespeare. Course topic changes; please see the Class Search for current topic. Satisfies the English and Pre- and Early Modern Studies Literature concentrations; also satisfies the Poetry and Pre- and Early Modern distribution requirement. May be repeated for credit. (General Education Code(s): TA.) S. Keilen

**170F. Charles Dickens. \***

Study of representative work by Charles Dickens. Satisfies the English and Modern Literary Studies concentrations. May be repeated for credit. (General Education Code(s): TA.) The Staff

**170G. Herman Melville. \***

Study of representative work by Herman Melville, including novels and short stories. Satisfies the English and Modern Literary Studies concentrations. The Staff

**170M. William Faulkner. \***

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. Satisfies the English and Modern Literary Studies concentrations. The Staff

**180. Topics.**

**180B. The Gothic Imagination in Fiction, Film, and Theory. \***

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. Satisfies the English and Modern Literary Studies concentrations. (General Education Code(s): TA.) R. Fox

**180D. Twain, Slavery, and the Literary Imagination. \***

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. Satisfies the English and Modern Literary Studies concentrations. (General Education Code(s): ER.) S. Gillman

**180H. Women's Literature. \***

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. Satisfies the English and Modern Literary Studies concentrations. May be repeated for credit. (General Education Code(s): TA.) The Staff

**180K. War in Contemporary American Culture. \***

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.

Satisfies the English and Modern Literary Studies concentrations. (General Education Code(s): TA.) The Staff

**180L. Representations of Hamlet. \***

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. Satisfies the English and Pre- and Early Modern concentrations; also satisfies the Pre- and Early Modern distribution requirement. The Staff

**180M. Topics in American Literature and Culture. \***

Studies in American literature and culture, with attention to historical context. Course topic changes; please see the Class Search for current topic. Satisfies the English and Modern Literary Studies concentrations. May be repeated for credit. (General Education Code(s): TA.) The Staff

**180V. The Vampire in Literature and Popular Culture. \***

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. Satisfies the English and Modern Literary Studies concentrations. (General Education Code(s): TA.) K. Lau

**190. Senior Seminars.**

Seminar offered to literature majors as a way to satisfy the senior exit requirement. Offered at different times by different instructors, focus is on topics of interest in English-language literatures. All students are required to complete an essay of

## Literature

significant length as part of the seminar coursework. May be repeated for credit. The Staff

### **190C. Studies in 19th-Century British Literature. \***

Study of selected authors or issues in 19th-century British literature. Course topic changes; see the Class Search for current topic. Satisfies the English and Modern Literary Studies concentrations; also satisfies the Senior Seminar distribution requirement. Prerequisite(s): Literature 101. Enrollment restricted to senior literature majors. May be repeated for credit. The Staff

### **190F. Studies in U.S. Literature. F,S**

Intensive examination of issues in U.S. literature. Course topic changes; see the Class Search for current topic. Satisfies the English and Modern Literary Studies concentrations; also satisfies the Senior Seminar distribution requirement. Prerequisite(s): Literature 101. Enrollment restricted to senior literature majors. May be repeated for credit. M. Perks, R. Wilson

### **190K. Studies in Poetry. \***

Studies in English-language poetry. Course topic changes; see the Class Search for current topic. Satisfies the English concentration; also satisfies the Poetry and Senior Seminar distribution requirements. Prerequisite(s): Literature 101. Enrollment restricted to senior literature majors. The Staff

### **190L. Studies in English Language Literature. W**

Studies of selected authors or issues in English language literature. Course topic changes; see the Class Search for current topic. Satisfies the English literature concentration; also satisfies the

Senior Seminar distribution requirement. Prerequisite(s): Literature 101. Enrollment restricted to senior Literature majors. R. Fox

### **192. Directed Student Teaching. F,W,S**

Teaching of a lower-division seminar under faculty supervision. Students submit petition to sponsoring agency. The Staff

### **195. Senior Essay. F,W,S**

Students submit petition to sponsoring agency. Prerequisite(s): Literature 101. Enrollment is restricted to seniors. The Staff

### **198. Group Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. The Staff  
**GRADUATE COURSES**

### **202. Canons. F**

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. Enrollment restricted to graduate students. May be repeated for credit. C. Chen

### **203. Periods and Movements. \***

Examines a particular historical period or literary movement. Course topic changes; see the Class Search for current topic. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **260. Transnational Literatures. \***

Investigation of English language literature which transcends national boundaries. Course topic changes; see the Class Search for current topic. Enrollment restricted to graduate students. May be repeated for credit. K. Gruesz

### **270. Individual Authors. \***

Intensive examination of works by individual authors. Course topic changes; see the Class Search for current topic. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **280. Topics in English Language Literature. \***

Course topic changes; see the Class Search for current topic. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **294. Teaching-Related Independent Study. F,W,S**

Directed graduate research and writing coordinated with teaching of undergraduates. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **295. Directed Reading. F,W,S**

Directed reading that does not involve a term paper. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **296. Special Student Seminar. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**297. Independent Study. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**299. Thesis Research. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

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## FRENCH LITERATURE

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### UPPER-DIVISION COURSES

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**131. The Middle Ages. \***

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. Satisfies the French and Pre- and Early Modern Studies Literature concentrations; also satisfies the Poetry and Pre- and Early Modern distribution requirements. May be repeated for credit. S. Kinoshita

**134. French Literature Outside France. S**

Speaking, reading, and writing proficiency in French required. A study of texts written in French-speaking cultures: Belgium, Canada, Africa, the Caribbean. Satisfies the French, Modern Literary Studies, and World Literature concentrations; also satisfies the Global distribution requirement. May be repeated for credit. (General Education Code(s): E.) W. Godzich

**135. Author and Culture. F**

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. Satisfies the French Literature concentration. May be repeated for credit. S. Kinoshita

**142. Studies in Poetry. \***

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. Satisfies the French and Modern Literary Studies concentrations. May be repeated for credit. W. Godzich

**143. Theater and Drama. \***

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. Satisfies the French and Modern Literary Studies concentrations. May be repeated for credit. W. Godzich

**152. Texts and Contexts. W**

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. Satisfies the French Literature concentration. May be repeated for credit. D. Bell

**195. Senior Essay. F,W,S**

Speaking, reading, and writing proficiency in French required. Prerequisite(s): Literature 101. Enrollment is restricted to seniors. Students submit petition to sponsoring agency. The Staff

**198. Group Tutorial. F,W,S**

Speaking, reading, and writing proficiency in French required. May be repeated for credit. The Staff

**199. Tutorial. F,W,S**

Speaking, reading, and writing proficiency in French required. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S**

Speaking, reading, and writing proficiency in French required. Students submit petition to sponsoring agency. The Staff

### GRADUATE COURSES

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**230. Studies in Literary and Cultural History. F**

In-depth examination of one period of French literature. Course topic changes; see the Class Search for current topic. Enrollment restricted to graduate students. May be repeated for credit. S. Kinoshita

**234. French Literature Outside France. S**

A study of texts written in French-speaking cultures: Belgium, Canada, Africa, the Caribbean. Enrollment restricted to graduate students. May be repeated for credit. W. Godzich

**240. Studies in Literary Genres. \***

An in-depth examination of one genre of French literature. Course topic changes; see the Class Search for current topic. Enrollment restricted to graduate students. May be repeated for credit. The Staff

## Literature

### **294. Teaching-Related Independent Study. F,W,S**

Directed graduate research and writing coordinated with the teaching of undergraduates. Students submit petition to sponsoring agency. The Staff

### **295. Directed Reading. F,W,S**

Directed reading which does not involve a term paper. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **296. Special Student Seminar. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **297. Independent Study. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **299. Thesis Research. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

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## GERMAN LITERATURE

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### UPPER-DIVISION COURSES

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#### **102. Introduction to German Literature. W**

Speaking, reading, and writing proficiency in German required. Wide reading of works representing the major authors, periods, and genres of German literature. Satisfies the German and Modern Literary Studies concentrations. T. Honnef

#### **104. Topics in German Literature and Culture. F**

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. Satisfies the German and Modern Literary Studies concentrations. May be repeated for credit. A. Bivens

#### **120. Fear of the Foreign: Xenophobia in German Literature and Culture. \***

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. Satisfies the German and Modern Literary Studies concentrations. L. Nygaard

#### **150. German Romanticism. \***

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. Satisfies the German and Modern Literary Studies concentrations. L. Nygaard

#### **154. The German Novelle. \***

Speaking, reading, and writing proficiency in German required. A study of Novellen of the major 19th-century German authors. Satisfies the German and Modern Literary Studies concentrations. A. Bivens

#### **159. German Comedy. S**

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. Satisfies the German and Modern Literary Studies concentrations. L. Nygaard

## Literature

### **161. Weimar Culture: Modernism in German Literature and Film. \***

Speaking, reading, and writing proficiency in German required. A survey of the literature, film and visual culture of the post-war Weimar period, concentrating in particular on modernism, Dada and the avant-garde. Selections from Fritz Lang, Murnau, Döblin, Brecht, Trakl. Satisfies the German and Modern Literary Studies concentrations. (General Education Code(s): IM.) A. Bivens

### **164. Modern German Fiction. \***

Speaking, reading, and writing proficiency in German required. Selected readings from the novel and novella in 20th-century German literature. Satisfies the German and Modern Literary Studies concentrations. The Staff

### **165. German Drama. \***

Speaking, reading, and writing proficiency in German required. Selected readings of major German dramatists; attention given to various movements in theater. Satisfies the German and Modern Literary Studies concentrations. The Staff

### **166. Contemporary German Literature and Film. \***

Speaking, reading, and writing proficiency in German required. A survey of contemporary German culture in the context of the current

debate on postmodernism and the avant-garde. Course topic changes; please see the Class Search for current topic. Satisfies the German and Modern Literary Studies concentrations. May be repeated for credit. A. Bivens

### **167. Modern German Literature and Film. \***

Speaking, reading, and writing proficiency in German required. Discusses a range of modern and contemporary German texts, including poetry, drama, and film. Satisfies the German and Modern Literary Studies concentrations. May be repeated for credit. A. Bivens

### **195. Senior Essay. F,W,S**

Speaking, reading, and writing proficiency in German required. Prerequisite: Literature 101. Enrollment is restricted to seniors. The Staff

### **198. Group Tutorial. F,W,S**

Speaking, reading, and writing proficiency in German required. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

Speaking, reading, and writing proficiency in German required. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S**  
Students submit petition to sponsoring agency. The Staff

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## GRADUATE COURSES

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### **294. Teaching-Related Independent Study. F,W,S**

Directed graduate research and writing coordinated with the teaching of undergraduates. Students submit petition to sponsoring agency. The Staff

### **295. Directed Reading. F,W,S**

Directed reading that does not involve a term paper. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **296. Special Student Seminar. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **297. Independent Study. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **299. Thesis Research. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

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## GREEK LITERATURE

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### UPPER-DIVISION COURSES

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### **100. Introduction to Greek Literature. S**

Reading proficiency in Ancient Greek required. Satisfies the Greek and Pre- and Early Modern Studies Literature concentrations; also satisfies the Pre- and Early Modern distribution requirement. May be

repeated for credit. (General Education Code(s): IH.) K. Bassi

### **102. Greek Poetry. W**

Reading proficiency in Ancient Greek required. Course topic changes; see the Class Search for current topic. Satisfies the Greek and Pre- and Early Modern Studies Literature concentrations; also satisfies the Poetry and Pre- and

Early Modern distribution requirements. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. May be repeated for credit. K. Bassi

### **103. Greek Drama. \***

Reading proficiency in Ancient Greek required. Course topic

## Literature

changes; see the Class Search for current topic. Satisfies the Greek and Pre- and Early Modern Studies Literature concentrations; also satisfies the Pre- and Early Modern Studies distribution requirement. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. May be repeated for credit. K. Bassi

### **104. Prose Authors. F**

Reading proficiency in Ancient Greek required. Course topic changes; see Class Search for the current topic. Satisfies the Greek, and Pre- and Early Modern concentrations; also satisfies the Pre- and Early Modern distribution requirement. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. May be repeated for credit. C. Hedrick

### **105. Special Topics in Greek Literature. \***

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. Satisfies the Greek and Pre- and Early Modern Studies Literature concentrations; also satisfies the Global and Pre- and

Early Modern distribution requirement. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. May be repeated for credit. The Staff

### **193. Field Study. F,W,S**

An individual program of study sponsored by a faculty member and completed off campus. Designed for upper-division students. May be taken concurrently or consecutively for up to three courses of credit. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **195. Senior Essay. F,W,S**

Reading proficiency in Ancient Greek required. Prerequisite(s): Literature 101. Enrollment is restricted to seniors. (Formerly Senior Thesis.) The Staff

### **198. Group Tutorial. F,W,S**

Reading proficiency in Ancient Greek required. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

Reading proficiency in Ancient Greek required. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

Reading proficiency in Ancient Greek required. Students submit

petition to sponsoring agency. The Staff

## GRADUATE COURSES

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### **294. Teaching-Related Independent Study. F,W,S**

Directed graduate research and writing coordinated with the teaching of undergraduates. The Staff

### **295. Directed Reading. F,W,S**

Directed reading that does not involve a term paper. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **296. Special Student Seminar. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **297. Independent Study. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **299. Thesis Research. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

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## ITALIAN LITERATURE

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### UPPER-DIVISION COURSES

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### **130. Author and Contexts.**

Designed to give an in-depth study of a given author's literary production and its cultural context. The Staff

### **130B. Boccaccio. \***

Speaking, reading, and writing proficiency in Italian required. Critical study of "The Decameron." Satisfies the Italian and Pre- and

Early Modern Studies concentrations; also satisfies the Poetry and Pre- and Early Modern distribution requirements. D. Shemek

### **130D. Dante's "Divine Comedy". \***

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. Satisfies the Italian, and Pre- and Early Modern Studies concentrations; also satisfies the Poetry and Pre- and Early Modern distribution requirements. The Staff

## Literature

### **150D. Italian Opera as Drama. \***

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. Satisfies the Italian Literature and Modern Literary Studies concentrations. Prerequisite(s): Two years of university study of Italian language, or equivalent proficiency. (General Education Code(s): CC.) D. Shemek

### **161. Italian Short Fiction. F**

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. Satisfies the Italian Literature concentration. (General Education Code(s): TA.) D. Shemek

### **164. Literature and Fascism. \***

Speaking, reading, and writing proficiency in Italian required. The relationship between literature and Italian fascism is explored as concerns 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. Satisfies the Italian and Modern Literary Studies concentrations. D. Shemek

### **165. Studies in Italian Literature and Culture. W**

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. Satisfies the Italian and Modern Literary Studies concentrations. May be repeated for credit. (W) E. Coggeshall, (S) D. Shemek

### **170A. Modern Italian Poetry. \***

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. Satisfies the Italian and Modern Literary Studies concentrations; also satisfies the Poetry distribution requirement. E. Coggeshall

### **170B. Petrarca. \***

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. Satisfies the Italian Literature, and Pre- and Early Modern Studies concentrations; also satisfies the Poetry distribution requirement. D. Shemek

### **180. Women in Italy: Nineteenth and Twentieth Centuries. \***

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. Satisfies the Italian and Modern Literary Studies concentrations. D. Shemek

### **191. Italian Studies Writing in the Discipline (1 credit). F,W,S**

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. The Staff

### **195. Senior Essay. F,W,S**

Speaking, reading, and writing proficiency in Italian required. Prerequisite(s): Literature 101. Enrollment is restricted to seniors. Students submit petition to sponsoring agency. (Formerly Senior Thesis.) The Staff

### **198. Group Tutorial. F,W,S**

Speaking, reading, and writing proficiency in Italian required. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

Speaking, reading, and writing proficiency in Italian required. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

Speaking, reading, and writing proficiency in Italian required. Students submit petition to sponsoring agency. The Staff

## GRADUATE COURSES

### **294. Teaching-Related Independent Study. F,W,S**

Directed graduate research and writing coordinated with the teaching of undergraduates. Students submit petition to sponsoring agency. Enrollment

## Literature

restricted to graduate students. May be repeated for credit. The Staff

### **295. Directed Reading. F,W,S**

Directed reading that does not involve a term paper. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **296. Special Student Seminar. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **297. Independent Study. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **299. Thesis Research. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

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## LATIN LITERATURE

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### UPPER-DIVISION COURSES

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#### **100. Introduction to Latin Literature. S**

Reading proficiency in Latin required. Course topic changes: see Class Search for the current topic. Satisfies the Latin, and Pre- and Early Modern Studies concentrations; also satisfies the Pre- and Early Modern distribution requirement. May be repeated for credit. (General Education Code(s): TA, IH.) J. Lynn

#### **102. Roman Poetry. F,W**

Reading proficiency in Latin required. Course topic changes; see the Class Search for current topic. Satisfies the Latin and Pre- and Early Modern Studies Literature concentrations; also satisfies the Poetry and Pre- and Early Modern distribution requirements. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. May be repeated for credit. M. Devecka

#### **103. Prose Authors. S**

Reading proficiency in Latin required. Course topic changes; see the Class Search for current topic. Satisfies the Latin and Pre- and Early Modern Studies Literature

concentrations; also satisfies the Pre- and Early Modern distribution requirement. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. May be repeated for credit. J. Lynn

#### **104. Special Topics in Latin Literature. \***

Reading proficiency in Latin required. Course topic changes; see the Class Search for current topic. Satisfies the Latin and Pre- and Early Modern Studies Literature concentrations; also satisfies the Poetry and Pre- and Early Modern distribution requirements. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. May be repeated for credit. The Staff

#### **193. Field Study. F,W,S**

An individual program of study sponsored by a faculty member and completed off campus. Designed for upper-division students. May be taken concurrently or consecutively for up to three courses of credit. Students submit petition to sponsoring agency. The Staff

#### **195. Senior Essay. F,W,S**

Reading proficiency in Latin required. Prerequisite(s): Literature 101. Enrollment is restricted to seniors. Students submit petition to sponsoring agency. (Formerly Senior Thesis.) The Staff

#### **198. Group Tutorial. F,W,S**

Reading proficiency in Latin required. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

#### **199. Tutorial. F,W,S**

Reading proficiency in Latin required. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

#### **199F. Tutorial (2 credits). F,W,S**

Reading proficiency in Latin required. Students submit petition to sponsoring agency. The Staff

### GRADUATE COURSES

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#### **294. Teaching-Related Independent Study. F,W,S**

Directed graduate research and writing coordinated with the teaching of undergraduates. The Staff

#### **295. Directed Reading. F,W,S**

Directed reading that does not

## Literature

involve a term paper. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**296. Special Student Seminar. F,W,S**  
Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**297. Independent Study. F,W,S**  
Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**299. Thesis Research. F,W,S**  
Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

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## MODERN LITERARY STUDIES

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### UPPER-DIVISION COURSES

**104. Topics in Literary Theory.**  
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Examination of major issues in contemporary theory, with emphasis on key concepts. Course topic changes; please see the Class Search for current topic. Satisfies the Modern Literary Studies concentration. (Formerly course 102A) May be repeated for credit. The Staff

**125. Modern Cinema.**

**125D. Cinema and Social Change in Latin America.** \*  
Surveys selected Latin American and Latino feature and documentary films. Course topic changes; please see the Class Search for current topic. Satisfies the Modern Literary Studies and World Literature concentrations; also satisfies the Global distribution requirement. May be repeated for credit. (General Education Code(s): CC, E.) J. Poblete

**125J. Cinema and Subjectivity.**  
W

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 Schedule of Classes for current topic. Satisfies the Modern Literary Studies concentration. May be repeated for credit. (General

Education Code(s): IM.) D. Selden

**125N. The Horror Film. S**

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. Satisfies the Modern Literary Studies concentration. May be repeated for credit. (General Education Code(s): IM.) H. Leicester

**144. Modern Jewish Cultures.**

Modernity transformed Jewish culture: we will explore the ways in which changed social, political, and economic conditions produced new gender roles; professional, personal, communal, and cultural experiences; and generated powerful fictions, autobiographies, films and poems. Among the writers we will read are Isaac Bashevis Singer, Rebecca Goldstein, Saul Bellow, Martin Buber, Hannah Arendt, and S.Y. Agnon. The Staff

**144A. Jewish Diaspora, Ethnicity, and Urban Life. F**

Focuses on modern Jewish diaspora, ethnicity, and urban life. Satisfies the Modern Literary Studies concentration. (General Education Code(s): ER, E.) B. Thompson

**144C. Literature and the Holocaust.** \*

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. Satisfies the Modern Literary Studies concentration. May be repeated for credit. The Staff

**144D. Jewish Writers and the American City.** \*

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. See the Class Search for the current topic. Satisfies the English and Modern Literary Studies concentrations. May be repeated for credit. (General Education Code(s): ER, E.) B. Thompson

**144E. Hebrew Poetry.** \*

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. Satisfies the Modern Literary Studies concentration; also satisfies the Poetry distribution requirement. May be repeated for credit. (General Education Code(s): CC.) The Staff

**144G. Global Jewish Writing. S**

Comparative analysis of modern Jewish writers from Western and non-Western diasporas. Satisfies the Modern and World Literature concentrations; also satisfies the Global distribution requirement. (General Education Code(s): E.) The Staff

**144H. Jewish Writers and the European City. \***

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. Satisfies the Modern Literary Studies concentration. May be repeated for credit. (General Education Code(s): ER.) The Staff

**144J. Jewish Travel Narratives. W**

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. Satisfies the Modern Literary Studies or the Pre- and Early Modern Studies Literature concentrations; may also satisfy the Pre- and Early Modern distribution requirement. M. Baumgarten

**145. Special Topics in Modern Literature.**

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**145A. Modern Poetry. \***

Survey of modern poetry; includes a variety of poetic forms. Course topic changes; see the Class Search for current topic. Satisfies the Modern Literary Studies concentration; also satisfies the Poetry distribution requirement. May be repeated for credit. (General Education Code(s): TA.) The Staff

**145B. Modern Literature. F**

Study of 19th- and/or 20th-century literature, with attention to its literary and historical context. Course topic changes; please see the for current topic. Satisfies the Modern Literary Studies concentration. May be repeated for credit. (General Education Code(s): TA.) D. Bell, C. Turk

**145C. Modern Fiction and Poetry. S**

Survey of modern fiction and poetry. Course topic changes; please see the Class Search for current topic. Satisfies the Modern Literary Studies concentration; also satisfies the Poetry distribution requirement. May be repeated for credit. R. Wilson

**145J. Speculative Fiction As Cultural Theory and Practice. W**

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. Satisfies the Modern Literary Studies concentration. May be repeated for credit. S. Gillman

**146. Topics in African Literature. \***

Thematic and stylistic linkages: classical texts, oral traditions, and modern developments in African literature. Satisfies the Modern Literary Studies and World Literature concentrations; also satisfies the Global distribution requirement. (General Education Code(s): E.) W. Godzich

**160. French Literature in Translation.**

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**160A. 1789 to the Present. S**

Considers the 19th-century French novel and its socio-historical background. Authors include Stendahl, Balzac, Flaubert, and Zola. All texts are read in English translation. Satisfies the Modern Literary Studies concentration. D. Bell

**167. German Authors in Translation.**

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**167G. Goethe's "Faust". \***

An intensive study of Goethe's "Faust," Parts I and II. All works are read in English. Satisfies the Modern Literary Studies concentration; also satisfies the Poetry distribution requirement. L. Nygaard

**167K. Kafka in Translation. \***

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. Satisfies the Modern Literary Studies concentration requirement. May be repeated for credit. (General Education Code(s): TA.) A. Bivens

**168. German Literature in Translation.**

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**168D. Germany in War and Peace. \***

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. Satisfies the Modern Literary Studies concentration. L. Nygaard

**168E. Behind the Berlin Wall.**

Examines cultural life in the German Democratic Republic between 1946 and 1992 through

## Literature

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. Satisfies the Modern Literary Studies concentration. (General Education Code(s): IM.) A. Bivens

### **180. Latin American Literature in Translation.**

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#### **180A. Contemporary Mexican Narrative. \***

Examines 20th and 21st century Mexican literature, with attention to literary critical issues as they relate to cultural, historical, and political contexts. Satisfies the Modern Literary Studies and World Literature concentrations; also satisfies the Global distribution requirement. (General Education Code(s): E.) The Staff

#### **190. Senior Seminar.**

Seminar offered to literature majors as a way to satisfy the senior exit requirement. Offered at different times by different instructors, focus is on topics of interest in modern literary studies. All students are required to complete an essay of significant length as part of the seminar coursework. Prerequisite: Literature 101. May be repeated for credit. The Staff

#### **190N. Topics in Modern Literary Studies. F,S**

Selected authors or issues in modern literary and cultural studies. Course topic changes; see the Class Search for current topic. Satisfies the Modern Literary Studies concentration; also satisfies the Senior Seminar distribution requirement. Prerequisite(s): Literature 101. Enrollment restricted to senior literature majors. May be repeated for credit. (F) W. Godzich, (S) A. Bivens

#### **190Y. Topics in Modern Jewish Literature and Culture. W**

Study of selected authors or issues related to modern Jewish literature and culture. Topic changes; please see the Class Search for current topic. Satisfies the Modern Literary Studies concentration; also satisfies the Senior Seminar distribution requirement. Jewish Studies majors may use this course to satisfy the Jewish Studies senior exit requirement. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and Literature 101 (for senior literature majors) or Jewish Studies 101 (for senior Jewish studies majors). May be repeated for credit. B. Thompson

#### **190Z. Topics in German Literature and Culture. \***

Study of selected authors or issues related to German literature and culture. Course topic changes; please see the Class Search for current topic. Satisfies the Modern Literary Studies concentration; also satisfies the Senior Seminar distribution requirement. German studies majors may use this course to satisfy the German studies senior exit requirement. Prerequisite(s): Literature 101 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to senior German studies and literature majors. May be repeated for credit. L. Nygaard

#### **192. Directed Student Teaching. F,W,S**

Teaching of a lower-division seminar under faculty supervision. (See course 42.) Students submit petition to sponsoring agency. The Staff

#### **195. Senior Essay. F,W,S**

Satisfies the Modern Literary Studies concentration; also satisfies the Modern Literary Studies senior exit distribution requirement. Prerequisite(s): Literature 101. Students submit petition to sponsoring agency. Enrollment restricted to senior literature majors. The Staff

#### **198. Group Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

#### **199. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

#### **199F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. The Staff

### **GRADUATE COURSES**

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#### **219. Feminist Theories/Historical Perspectives. \***

A critical examination of feminist and related theories (queer, critical race, post-humanist) and criticism in historical and culturally specific contexts. Enrollment restricted to graduate students. C. Freccero

#### **231. Studies in Literary and Cultural History. S**

Course topic changes; see the Class Search for current topic. Enrollment restricted to graduate students. May be repeated for credit. J. Aladro Font

#### **270. Narrative Theory. W**

A survey of 20th-century narratology, emphasizing structuralist and poststructuralist theories of narrative. Enrollment restricted to graduate students. May be repeated for credit. J. Jordan

## Literature

### **280. Topics in Theory. W**

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. Enrollment restricted to graduate students. May be repeated for credit. D. Bell, J. Poblete

### **294. Teaching-Related Independent Study. F,W,S**

Directed graduate research and writing coordinated with the teaching of undergraduates.

Students submit petition to sponsoring agency. The Staff

### **295. Directed Reading. F,W,S**

Directed reading that does not involve a term paper. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **296. Special Student Seminar. F,W,S**

Students submit petition to sponsoring agency. Enrollment

restricted to graduate students. May be repeated for credit. The Staff

### **297. Independent Study. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **299. Thesis Research. F**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

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## PRE- AND EARLY MODERN LITERATURE

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### UPPER-DIVISION COURSES

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#### **102. Ancient Literature in Cross-Cultural Perspective. F,W,S**

Comparative approaches to the study of ancient literature and culture. Topic changes; see the Class Search for current topic. Satisfies the Pre- and Early Modern and World Literature concentrations; also satisfies the Global and Pre- and Early Modern distribution requirements. May be repeated for credit. (General Education Code(s): CC.) (W) S. Keilen, (FS) M. Devecka

#### **107A. Reading Egyptian Hieroglyphs, Part 1. W**

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. Satisfies the Pre- and Early Modern Studies and World Literature concentrations; also satisfies the Global and Pre- and Early Modern distribution requirements. Strongly

recommended: two years previous study of a foreign language at the college level or the equivalent. (General Education Code(s): CC.) D. Selden

#### **107B. Reading Egyptian Hieroglyphs, Part 2. S**

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. Satisfies the Pre- and Early Modern Studies and World Literature concentrations; also satisfies the Global, Pre- and Early Modern, and Poetry distribution requirements. Together, Egyptian Hieroglyphs 1 and fulfill the language prerequisites for Literature 102; together they also satisfy the intensive major second-language course requirements. Prerequisite(s): course 107A. (General Education Code(s): CC.) D. Selden

#### **107C. Reading Egyptian Hieroglyphs, Part 3. \***

Close reading of the "Tale of Sinuhe" in Middle Egyptian. Satisfies the Pre- and Early Modern Studies and World Literature concentrations;

also satisfies the Global, Poetry, and Pre- and Early Modern distribution requirements. Prerequisite(s): course 107A and 107B. D. Selden

#### **119. Medieval Romance.**

A study of representative texts from the 12th through the 15th centuries. Questions of subjectivity, sexuality, and history in romance narratives are addressed. Satisfies the Pre- and Early Modern Studies concentration; also satisfies the Pre- and Early Modern distribution requirement. The Staff

#### **128. Medieval Epic. \***

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. Satisfies the Pre- and Early Modern Studies Literature concentration; also satisfies the Poetry and Pre- and Early Modern distribution requirements. H. Leicester

#### **134. The Idea of Poetry. \***

Focus is on the theories of rhetoric and poetry written between 1580 and 1620. Texts include English, Italian, French, and Spanish works. Satisfies the Pre- and Early Modern

## Literature

Studies concentration; also satisfies the Poetry and Pre- and Early Modern Studies distribution requirements. (General Education Code(s): TA.) S. Keilen

### **135. Travel Writing and Intercultural Relations in the Middle Ages. \***

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. Satisfies the Pre- and Early Modern Studies and World Literature concentrations; also satisfies the Global and Pre- and Early Modern distribution requirements. C. Gomez-Rivas

### **136. Representations of Gender in Medieval Literature. \***

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. Satisfies the Pre- and Early Modern Studies Literature concentration; also satisfies the Poetry and Pre- and Early Modern distribution requirements. H. Leicester

### **137. Modern Ancient Drama. \***

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. Satisfies the Pre- and Early Modern Studies Literature concentration; also satisfies the Pre- and Early Modern

distribution requirement. (General Education Code(s): IM.) The Staff

### **143. Greek Drama/Modern Film. \***

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. Satisfies the Pre- and Early Modern Studies concentrations; also satisfies the Pre- and early Modern distribution requirement. The Staff

### **144. Pre- and Early Modern Jewish Cultures.**

#### **144B. Hebrew Bible. \***

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. Satisfies the Pre- and Early Modern Studies Literature concentration; also satisfies the Pre- and Early Modern distribution requirement. May be repeated for credit. (General Education Code(s): TA.) The Staff

#### **146. The Phenomenon of Tragedy. \***

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. Satisfies the English and Pre- and Early Modern Studies literature concentrations; also

satisfies the Pre- and Early Modern distribution requirement. The Staff

### **149. Ancient Myth/Modern Poetics. \***

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. Satisfies the Pre- and Early Modern concentration; also satisfies the Poetry and Pre- and Early Modern distribution requirements. The Staff

### **150. Pre- and Early Modern Literature in Translation.**

#### **150B. Early Modern Italian Women Writers. \***

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. Satisfies the Pre- and Early Modern Studies concentrations; also satisfies Pre- and Early Modern distribution requirements. D. Shemek

#### **150D. "Orlando Furioso". \***

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. Satisfies the Pre- and Early Modern Studies concentration; also satisfies the Poetry and Pre- and Early Modern

## Literature

Studies distribution requirements. (General Education Code(s): CC.) D. Shemek

**152. Continental Renaissance. \*** 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. Satisfies the Pre- and Early Modern Studies concentration; also satisfies the Pre- and Early Modern Studies distribution requirement. The Staff

**153A. Biblical Hebrew, Part 1. \*** Grammatical study interspersed with narrative excerpts from the Hebrew Bible. Recommended: previous study of a second language up to the advanced level. Satisfies the Pre- and Early Modern studies and World Literature concentrations; also satisfies the Global and Pre- and Early Modern distribution requirements. D. Selden

**153B. Biblical Hebrew, Part 2. \*** Continuation of grammatical study interspersed with poetic texts from the Hebrew Bible. Satisfies the Pre- and Early Modern and World Literature concentrations; also satisfies the Global, Poetry, and Pre- and Early Modern distribution requirements. Together, Biblical Hebrew 1 and 2 fulfill the language prerequisites for Literature 102; together they also satisfy the intensive major second-language course requirements. Prerequisite(s): course 153A or the equivalent. D. Selden

**153D. Sanskrit, Part 1. \*** Systematic introduction to the grammar, syntax, and usage of Classical Sanskrit, to the oral dimensions of the language, and to the Sanskrit literary tradition. Satisfies the Pre- and Early Modern and World Literature

concentrations; also satisfies the Global, Poetry, and Pre- and Early Modern distribution requirements. G. Sahota

**153E. Sanskrit, Part 2. \*** 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. Satisfies the Pre- and Early Modern and World Literature concentrations; also satisfies the Global, Poetry, and Pre- and Early Modern distribution requirements. Together Sanskrit, Part 1 and Part 2 fulfill the language prerequisites for Literature 102; together they also satisfy the intensive major second-language course requirements. Prerequisite(s): course 153D. G. Sahota

**162. Early Modern Representations of Gender. \*** Explores representation of gender in early modern literature, with attention to contemporary aesthetic, cultural, and theoretical contexts. Texts include drama, poetry, and prose. Satisfies the Pre- and Early Modern Studies concentration; also satisfies the Pre- and Early Modern distribution requirement. May be repeated for credit. The Staff

**165. Classical Poetics in Elizabethan Verse. \*** 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. Satisfies the English and the Pre-

and Early Modern Studies concentration; also satisfies the Pre- and Early Modern distribution requirements. The Staff

**183. Dante's "Divine Comedy". F** 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. Satisfies the Pre- and Early Modern Literature concentration; also satisfies the Poetry and Pre- and Early Modern distribution requirements. (General Education Code(s): TA.) E. Coggeshall

**190. Senior Seminar.** Seminar offered to literature majors as a way to satisfy the senior exit requirement. Offered at different times by different instructors, focus is on topics of interest in pre- and early modern studies. All students are required to complete an essay of significant length as part of the seminar coursework. Prerequisite: Literature 101. May be repeated for credit. The Staff

**190P. Topics in Pre- and Early Modern Studies. F** 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. Satisfies the Pre- and Early Modern Literature concentration; also satisfies the Pre- and Early Modern and Senior Seminar distribution requirements. Prerequisite(s): Literature 101. Enrollment restricted to senior literature majors. May be repeated for credit. H. Leicester

**192. Directed Student Teaching. F,W,S** Teaching of a lower-division seminar under faculty supervision.

## Literature

(See course 42.) Students submit petition to sponsoring agency. The Staff

### **195. Senior Essay. F,W,S**

Prerequisite(s): Literature 101. The course is restricted to seniors. Students submit petition to sponsoring agency. The Staff

### **198. Group Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## GRADUATE COURSES

### **204. Studies in Early Modernity.**

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In-depth examination of a topic in Early Modern Studies. Course topic changes; see the Class Search for current topic. Enrollment restricted to graduate students. May be repeated for credit. J. Aladro Font

### **211. History and Tragedy. \***

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. Enrollment restricted to graduate students. K. Bassi

### **294. Teaching-Related Independent Study. F,W,S**

Directed graduate research and writing coordinated with the teaching of undergraduates. Students submit petition to sponsoring agency. The Staff

### **295. Directed Reading. F,W,S**

Directed reading that does not involve a term paper. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **296. Special Student Seminar. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **297. Independent Study. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **299. Thesis Research. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

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## RUSSIAN LITERATURE

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### UPPER-DIVISION COURSES

#### **199. Tutorial. F,W,S**

Speaking, reading, and writing proficiency in Russian required. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

#### **199F. Tutorial (2 credits). F,W,S**

Speaking, reading, and writing proficiency in Russian required. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

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## SPANISH/LATIN AMERICAN/LATINO LITERATURES

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### LOWER-DIVISION COURSES

#### **60. Introduction to Literary Genres. F**

Speaking, reading, and writing proficiency in Spanish required. The study of poetry, drama, and prose in Spain and Latin America. (General Education Code(s): TA, IH, E.) V. Fernandez

### UPPER-DIVISION COURSES

#### **100A. Origins to 18th Century.**

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. The Staff

#### **100B. Peninsular Literature: 19th and 20th Centuries. \***

Speaking, reading, and writing proficiency in Spanish required. A critical study of several representative texts from this period of Spanish literature.

## Literature

Satisfies the Modern Literary Studies and Spanish Literature concentrations. (Formerly Nineteenth and Twentieth Centuries.) The Staff

### **102. Introduction to Hispanic American Literature.**

#### **102A. From the Conquest to Sor Juana. W**

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. Satisfies the Pre- and Early Modern Studies, Spanish and World Literature concentrations; also satisfies the Global and Pre- and Early Modern distribution requirements. (General Education Code(s): CC.) J. Aladro Font

#### **102B. Romanticism to Modernism. \***

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. Satisfies the Modern Literary Studies, Spanish, and World Literature concentrations; also satisfies the Global distribution requirement. (General Education Code(s): CC, E.) The Staff

#### **103. Sor Juana Ines de la Cruz. \***

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. Satisfies the Pre- and Early Modern Studies and Spanish Literature concentrations; also satisfies the Pre- and Early Modern distribution requirement. J. Aladro Font

#### **104. Erotismo y Mistica. \***

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. Satisfies the Pre- and Early Modern Studies and Spanish Literature concentrations; also satisfies the Pre- and Early Modern distribution requirement. J. Aladro Font

#### **105. Introduction to Spanish Studies. W**

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. Satisfies the Modern, Spanish, and World Literature concentrations; also satisfies the Global distribution requirement. (Also offered as Spanish 105. Students cannot receive credit for both courses.) Prerequisite(s): Spanish 6 or Spanish for Heritage Speakers 6 or permission of instructor. (General Education Code(s): ER.) J. Aladro Font

#### **130. Studies in Latin American Literary Genres.**

#### **130A. Contemporary Spanish American Prose. \***

Speaking, reading, and writing proficiency in Spanish required. Examines contemporary Spanish American prose. Course topic changes; please see the Class Search for current topic. Satisfies the Modern Literary Studies, Spanish, and World Literature concentrations; also satisfies the Global distribution requirement. (General Education Code(s): CC, E.) The Staff

#### **130D. Latin American "testimonio". \***

Speaking, reading, and writing proficiency in Spanish required. Contemporary non-fiction testimonial literature of Latin America. Authors: Marta Rojas, Elene Poniatowska, Rigoberta Menchu, Noema Viezzer, Omar Cabezas Lacayo, Anibel Quijada Cerda, Mario Payeras, Eduardo Galeano, Ricardo Pozas, Hugo Neiva Samanez, Luis González de Alba. Satisfies the Modern Literary Studies, Spanish, and World Literature concentrations; also satisfies the Global distribution requirement. (General Education Code(s): E.) J. Poblete

#### **130E. Latin American Poetry. W**

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. Satisfies the Modern Literary Studies, Spanish, and World Literature concentrations; also satisfies the Global and Poetry distribution requirements. (General Education Code(s): CC, E.) V. Fernandez

#### **131. National Literatures of Latin America.**

Speaking, reading, and writing

## Literature

proficiency in Spanish required. A study of the literary expression of a particular Latin American country or region, with texts representing a variety of authors, periods, and genres. The Staff

### **131H. Cuba. \***

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. Satisfies the Modern Literary Studies, Spanish, and World Literature concentrations; also satisfies the Global distribution requirement. May be repeated for credit. (General Education Code(s): CC, E.) The Staff

### **134. Special Topics in Latin American Literature.**

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#### **134B. Women in Latin American Literature. F**

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. Satisfies the Modern Literary Studies, Spanish, and World Literature concentrations; also satisfies the Global distribution requirement. (General Education Code(s): E.) V. Fernandez

#### **134L. Historia de la lectura y los lectores: Recepcion y consumo cultural en el mundo Latino Americano. \***

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. Satisfies the Modern Literary Studies, Spanish, and World Literature concentrations; also satisfies the Global distribution requirement. (General Education Code(s): E.) J. Poblete

#### **134M. Modernidad y literatura: El Boom de la novela latinoamericana. F**

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. Course satisfies the Modern Literary Studies, Spanish, and World Literature concentrations; also satisfies the Global distribution requirement. (General Education Code(s): E.) J. Poblete

#### **134N. El Cuento Hispanoamericano: Variedades esteticas de la literatura breve en America Latina. \***

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. Satisfies the Modern Literary Studies, Spanish, and World Literature concentrations; also satisfies the Global distribution requirement. (General Education Code(s): E.) J. Poblete

### **135. Latin American Cinema.**

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#### **135C. La Globalizacion en/del Cine Latin/o Americano. F**

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. Course satisfies the Modern Literary Studies, Spanish/Latin American/Latino, and World Literature concentrations; also satisfies the Global distribution requirement. (General Education Code(s): E.) J. Poblete

#### **135E. Cine y sexualidad en América Latina. \***

Speaking, reading, and writing proficiency in Spanish required. Changing cinematic representations of masculinity, femininity, and sexuality and their articulation with expressions of the national in feature films made in various Latin American countries between 1940 and the present. Satisfies the Modern, Spanish, and World Literature concentrations; also satisfies the Global distribution requirement. (General Education Code(s): E.) The Staff

#### **135F. Cine y Literatura. \***

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. Satisfies the Spanish and World Literature concentrations; also satisfies the Global distribution requirement. May be repeated for credit. (General Education Code(s): IM.) The Staff

#### **151. Literature and Life in "Don Quijote" and Other Cervantes Texts. \***

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

## Literature

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. Satisfies the Pre- and Early Modern Studies and Spanish Literature concentrations; also satisfies the Pre- and Early Modern distribution requirement. J. Aladro Font

### **152. Spanish Golden Age Theater. S**

Speaking, reading, and writing proficiency in Spanish required. Studies in Spanish Golden Age theater. Satisfies the Pre- and Early Modern Studies and Spanish Literature concentrations; also satisfies the Pre- and Early Modern distribution requirement. J. Aladro Font

### **153. The Picaresque Novel. \***

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." Satisfies the Pre- and Early Modern and Spanish Literature concentrations; also satisfies the Pre- and Early Modern distribution requirement. (General Education Code(s): CC.) J. Aladro Font

### **154. Short Stories of the Spanish Golden Age. \***

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. Satisfies the Pre- and Early Modern Studies and Spanish Literature concentrations, also satisfies the Pre- and Early Modern distribution requirement. J. Aladro Font

### **163. The Literature of the Spanish Civil War. \***

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. Satisfies the Modern Literary Studies and Spanish Literature concentrations. The Staff

### **164. Contemporary Spanish Literature. \***

Speaking, reading, and writing proficiency in Spanish required. Examines works by Spanish peninsular authors from the 19th century to the present with attention to historical and cultural as well as literary issues. The topic changes, see the Class Search for current topic. Satisfies the Modern Literary Studies and Spanish Literature concentrations. (Formerly Fiction and History in Contemporary Spain.) May be repeated for credit. The Staff

### **166. The Latin American Essay. \***

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. Satisfies the Modern Literary studies, Spanish, and World Literature concentrations; also

satisfies the Global distribution requirement. (Formerly Twentieth-Century Spanish American Essay.) The Staff

### **190. Senior Seminar. S**

Offered to literature majors to satisfy the senior exit requirement. Offered at different times by different instructors. The focus is on topics of interest in Spanish and Latin American literature and culture. All students are required to complete an essay of significant length as part of the seminar coursework. Prerequisite(s): Literature 101. May be repeated for credit. The Staff

### **195. Senior Essay. F,W,S**

Speaking, reading, and writing proficiency in Spanish required. Prerequisite(s): Literature 101. The course is restricted to seniors. Students submit petition to sponsoring agency. The Staff

### **198. Group Tutorial. F,W,S**

Speaking, reading, and writing proficiency in Spanish required. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

Speaking, reading, and writing proficiency in Spanish required. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

Speaking, reading, and writing proficiency in Spanish required. Students submit petition to sponsoring agency. The Staff

GRADUATE COURSES

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**201. "Don Quixote". \***

Concentrates on the study and analysis of Miguel de Cervantes' major work "Don Quixote," with a three part structure: life and literature in "Don Quixote;" Cervantes-the father of the modern novel; and madness and "ingenio" in "Don Quixote." Enrollment restricted to graduate students. J. Aladro Font

**210. Spain in the Eyes/Camera of Pedro Almodovar. \***

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. Enrollment restricted to graduate students. J. Aladro Font

**215. The Conquest through the Eyes of Contemporary Writers. S**

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. Enrollment limited to 20. J. Aladro Font

**225. The Avant Garde in Latin America. \***

Emerging from a Europe in crisis, this 20th-century avante-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. Enrollment restricted to graduate students. The Staff

**226. Teoria Critica en America Latina. W**

Overview of contemporary theoretical issues in Latin American cultural critique. Course topic changes; please see the Class Search for current topic. Enrollment restricted to graduate students. May be repeated for credit. J. Poblete

**230. Citiscapes. F**

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. Enrollment restricted to graduate students. N. Klahn

**231. National Literatures of Latin America.**

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**231A. Cuba. \***

Course topic changes; please see the Class Search for current topic. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**295. Directed Reading. F,W,S**

Directed reading that does not involve a term paper. Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**296. Special Student Seminar. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**297. Independent Study. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**299. Thesis Research. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

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WORLD LITERATURE AND CULTURAL STUDIES

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UPPER-DIVISION COURSES

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**105. International Cyberpunk. \***

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. Satisfies the Modern Literary Studies and World Literature concentrations; also satisfies the Global distribution

requirement. (General Education Code(s): PE-T.) W. Godzich

**109. Topics in Cultural Studies. F**

Studies in the theory of cultural studies. Course topic changes; see the Class Search for the current topic. Satisfies the World Literature concentration; also satisfies the Global distribution requirement. May be repeated for credit. (General Education Code(s): TA, E.) The Staff

**113. The Future. \***

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. Satisfies the Modern Literary Studies and World Literature concentrations; also satisfies the Global distribution requirement. C. Connery

**115. Modern Literature in a Global Context.**

**115A. Fiction in a Global Context. \***

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. Satisfies the Modern Literary Studies and World Literature concentrations; also satisfies the Global distribution requirement. May be repeated for credit. (General Education Code(s): TA.) V. Cooppan

**117. Latin/o American Fiction. S**

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. Satisfies the Modern Literary Studies and World Literature concentrations; also satisfies the Global distribution requirement. (Formerly History and Memory in the New World.) (General Education Code(s): E.) K. Gruesz

**123. The 1960s. \***

An interdisciplinary study of the cultural and social movements of the 1960s. Satisfies the Modern Literary Studies and World Literature concentrations; also satisfies the Global distribution requirement. (General Education Code(s): E.) C. Connery

**124. Cultural Theory in Historical Perspective. \***

Examination of representations of medieval and early modern Mediterranean history. Course topic changes; please see the Class Search for current topic. Satisfies the Pre- and Early Modern Studies and World Literature concentrations; also satisfies the Global and Pre-

and Early Modern distribution requirements. May be repeated for credit. (General Education Code(s): CC, E.) C. Gomez-Rivas

**127. Chicano/Mexicano Geographies. \***

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. Satisfies the English, Modern Literary Studies, and World Literature concentrations; also satisfies the Global distribution requirement. (General Education Code(s): ER, E.) K. Gruesz

**129. Theorizing Race and Comics. \***

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. Satisfies the English, Modern Literary Studies, and World Literature concentrations; also satisfies the Global distribution requirement. Enrollment by interview only; course requires an essay application. Enrollment restricted to literature and history of art and visual culture majors. (General Education Code(s): ER.) C. Hong

**132. Global Cities. \***

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. Satisfies the Modern Literary Studies and World Literature concentrations; also satisfies the Global distribution requirement. May be repeated for credit. (General Education Code(s): CC.) C. Connery

**135. Classical Chinese Culture and Literature, 10th Century B.C.E. through Sixth Century C.E. \***

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. Satisfies the Pre- and Early Modern and World Literature concentrations; also satisfies the Global, Poetry, and Pre- and Early Modern distribution requirements. (Also offered as History 141A. Students cannot receive credit for both courses.) (General Education Code(s): E.) C. Connery

**136. Classical Chinese Culture and Literature, Sixth Century through 16th Century. \***

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. Satisfies the Pre- and Early Modern Studies and World Literature concentrations; also satisfies the Global, Poetry, and Pre- and Early Modern distribution requirements. (Also offered as

## Literature

History 141B. Students cannot receive credit for both courses.) (General Education Code(s): E.) C. Connery

### **140. The Historical Imaginary. F**

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 US imperialism. Satisfies the Modern Literary Studies and World Literature concentrations; also satisfies the Global distribution requirement. (General Education Code(s): E.) S. Gillman

### **142. Topics in the Literatures and Cultures of Southern Asia. W,S**

Provides in-depth analysis of literary and cultural phenomena of southern Asia. The course topic changes; see the Class Search for the current topic. Satisfies the World Literature concentration; also satisfies the Global Distribution requirement. May be repeated for credit. (General Education Code(s): CC.) G. Sahota

## **150. WORLD LITERATURE AND CULTURAL STUDIES CORE SEQUENCE.**

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### **150A. Worldings. \***

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. Satisfies the Modern Literary Studies and World Literature concentrations; also satisfies the Global distribution requirement. May be repeated for credit. V. Cooppan

### **150B. Space/Time. \***

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. Satisfies the Modern Literary Studies and World Literature concentrations; also satisfies the Global distribution requirement. May be repeated for credit. The Staff

### **150C. Problems. \***

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. Satisfies the Modern Literary Studies and World Literature concentrations; also satisfies the Global requirement. May be repeated for credit. The Staff

### **190. Senior Seminar.**

Seminar offered to literature majors as a way to satisfy the senior exit requirement. Offered at different times by different instructors; focus is on topics of interest in world literature and cultural studies. All students are required to complete an essay of significant length as part of the seminar coursework.

Prerequisite(s): Literature 101. The Staff

### **190A. Topics in World Literature and Cultural Studies. W**

Course topic changes; see the Class Search for current topic. Satisfies the World Literature concentration; also satisfies the Global and Senior Seminar distribution requirements. Prerequisite(s): Literature 101. Enrollment restricted to senior literature majors. May be repeated for credit. (General Education Code(s): E.) G. Sahota

### **190B. Studies in Slavery, Race, and Nation in the Americas. \***

Compares literatures and histories of slavery, abolitionism, and nationalism in 19th-century Cuba and the U.S. Readings include slave narratives and antislavery novels. Satisfies the Modern Literary Studies and World Literature concentrations; also satisfies the Global and Senior Seminar distribution requirements.

Prerequisite(s): Literature 101. Enrollment restricted to senior literature majors. (General Education Code(s): E.) S. Gillman

### **192. Directed Student Teaching. F,W,S**

Teaching of a lower-division seminar under faculty supervision. Students submit petition to sponsoring agency. The Staff

### **195. Senior Essay. F,W,S**

Prerequisite(s): Literature 101. Students submit petition to sponsoring agency. The course is restricted to seniors. May be repeated for credit. The Staff

### **198. Group Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## **GRADUATE COURSES**

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### **201. Theory and Methods. \***

Global theories of history and cultural production. Course topic changes; see the Class Search for current topic. Enrollment restricted to graduate students. May be repeated for credit. S. Gillman

Literature

**209. Topics in Cultural Studies. F,W,S**

Course topic changes; see the Class Search for current topic. Enrollment restricted to graduate students. May be repeated for credit. (F) D. Selden, (W) V. Cooppan, (S) C. Connery

**295. Directed Reading. F,W,S**

Directed reading which does not require a term paper. Students submit petition to sponsoring agency. Enrollment restricted to

graduate students. May be repeated for credit. The Staff

**296. Special Student Seminar. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**297. Independent Study. F,W,S**

Students submit petition to sponsoring agency. Enrollment

restricted to graduate students. May be repeated for credit. The Staff

**299. Thesis Research. F,W,S**

Students submit petition to sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# MATHEMATICS

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2015-16 General Catalog

4111 McHenry

(831) 459-2969

<http://www.math.ucsc.edu>

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## PROGRAM DESCRIPTION

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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 and cutting-edge ways of applying mathematics to their fields. A strong mathematics background is vital to the advanced study of the physical and biological sciences and plays an integral role in studying the social sciences. The UCSC mathematics program offers a wide variety of undergraduate mathematics 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 encouraged to take the mathematics assessment as early as possible. Failure to begin the calculus series upon arrival at UCSC could delay progress in some majors. Students concerned about their ability to place into courses above Mathematics 2 or Mathematics 3 should consider taking these courses or their equivalent prior to entering UCSC.
- Lower-division courses with numbers in the range 11A-B through 24 (calculus, linear algebra, multivariable calculus, and differential equations) prepare students for further study in mathematics, the physical and biological sciences, or quantitative areas of the social sciences. Science majors take a combination of these courses as part of their undergraduate studies.
- Upper-division courses, with numbers in the range 100-199, 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, multivariable calculus, and proof and problem solving are prerequisite to most of these advanced courses.

- Within the major, there are three concentrations leading to the bachelor of arts (B.A.) degree: pure mathematics, computational mathematics, and mathematics education. These programs 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. Please read the pure mathematics, computational mathematics, and mathematics education program descriptions below for specific information about course requirements. A minor in mathematics is also offered.

The mathematics program provides an excellent liberal arts background from which to pursue a variety of career opportunities. UCSC graduates with degrees 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 of mathematics are trained in the art of problem-solving, an essential skill in all professions.

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## PROGRAM LEARNING OUTCOMES

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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

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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, students must develop and unceasingly exercise their analytical abilities. Students who have learned to logically question assertions, recognize patterns, and distinguish the essential and irrelevant aspects of problems can think deeply and precisely, nurture the products of their imagination to fruition in reality, and share their ideas and insights while seeking and benefiting from the knowledge and insights of others.

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. 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, developing their ability to collaborate intellectually and creatively in diverse contexts, and to 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 abandon familiar but restrictive habits of thought. The overarching objectives can be realized in terms of more focused, appraisable objectives specific to mathematics as follows:

## CRITICAL THINKING

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Students will:

- understand the basic rules of logic, including the role of axioms or assumptions;
- appreciate the role of mathematical proof in formal deductive reasoning;
- be able to distinguish a coherent argument from a fallacious one, both in mathematical reasoning and in everyday life;
- understand and be able to articulate the differences between inductive and deductive reasoning;
- proficiently construct logical arguments and rigorous proofs; and
- formulate conjectures by abstracting general principles from examples.

Courses: 20AB, 100, 101, 105AB, 110, 111AB, 117, 118, 160, 161.

## PROBLEM SOLVING

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Students will be able to:

- formulate and solve abstract mathematical problems;
- recognize real-world problems that are amenable to mathematical analysis, and formulate mathematical models of such problems;
- apply mathematical methodologies to open-ended, real-world problems;
- recognize connections between different branches of mathematics; and
- recognize and appreciate the connections between theory and applications.

Courses: 19AB, 20AB, 22, 23AB, 24, 100, 101, 103AB, 106, 107, 114, 115, 116, 134, 145.

## EFFECTIVE COMMUNICATION

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Students will be able to:

- present mathematics clearly and precisely to an audience of peers and faculty;
- appreciate the role of mathematical proof as a means of conveying mathematical knowledge;
- understand the differences between proofs and other less formal arguments;
- make vague ideas precise by formulating them in mathematical language;
- describe mathematical ideas from multiple perspectives; and
- explain fundamental mathematical concepts or analyses of real-world problems to non-mathematicians.

Courses: 100, 101, 105AB, 111AB, 188, 189, 194, 195.

## SUBJECT-SPECIFIC KNOWLEDGE

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Students must demonstrate mastery in the three basic areas of mathematics: algebra, analysis, and topology/geometry on a basic level in lower-division courses and at an advanced level in upper-division courses.

### ALGEBRA, NUMBER THEORY, AND COMBINATORICS

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*"We must endeavor to persuade those who are to be the principal men of our State to go and learn arithmetic, not as amateurs, but they must carry on the study until they see the nature of numbers with the mind only; not like merchants or retail-traders, with a view to buying or selling, but for the sake of their military applications and the benefit of the soul. . . I must add how charming the science is, and in how many ways it conduces to our desired end, if pursued in the spirit of a philosopher, and not of a shopkeeper!"—*  
Plato, THE REPUBLIC

Abstract algebra involves the study of algebraic structures, such as groups, rings, fields, modules, vector spaces, and algebras. Linear algebra is a crucial subfield of algebra, both as an introduction to abstract algebraic structures and as a body of advanced results of immense importance in diverse areas of application. Number theorists study properties of the integers, as well as those of mathematical objects constructed from or generalizing the integers. Combinatorics involves finite or countable discrete structures, such as abstract graphs.

Courses: Math 21, 100, 110, 111AB, 114, 115, 116, 117, 118, 120, 134.

### CALCULUS AND ANALYSIS

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*Although the nature of is in no way altered when they appear. . . on the right-hand side of the differential equation, nonetheless their role and the character of the equation are thereby altered. . . They are brought into the world unilaterally, shadow figures lacking the body which cast them ...The initiative is thus shifted from the right-hand pole, the algebraic, to the left-hand one, the symbolic.—Karl Marx, ON THE DIFFERENTIAL*

Analysis extends and refines calculus; it encompasses differentiation, integration, measure, limits, infinite series, and analytic functions, primarily in the context of real and complex number systems. In much of analysis, the emphasis is not on finding explicit solutions to specific problems, but rather on determining which problems can be solved and what general properties solutions may share. Ordinary and

partial differential equations play a central role in analysis, and are widely used in modeling real-world systems.

Courses: Math 19AB, 20AB, 23AB, 24, 100, 103AB, 105AB, 106, 107, 140, 145, 148.

### GEOMETRY AND TOPOLOGY

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*"My noble friend, geometry will draw the soul towards truth, and create the spirit of philosophy . . . nothing should be more sternly laid down than that the inhabitants of your fair city should by all means learn geometry. Moreover, the science has significant indirect effects...in all departments of knowledge, as experience proves, anyone who has studied geometry enjoys infinitely quicker understanding than one who has not."—Plato, THE REPUBLIC*

Geometry explores the implementation and far-reaching consequences of systems of measurement; topology addresses questions pertaining to shape and global structure. Non-Euclidean geometry, differential geometry (the extension of calculus to mapping of curves, surfaces, and their generalizations), and algebraic geometry generalize key results and techniques from Euclidean geometry to both familiar and exotic settings. In algebraic and differential topology, techniques from diverse areas of mathematics are used to infer information about the shapes and related properties of spaces.

Courses: Math 23AB, 121AB, 124, 128AB, 129, 130.

This subdivision of mathematics is not sharp: the areas of overlap between the three main areas of mathematics are of great interest and importance. For example, analytic number theory is the study of the integers by means of tools from real and complex analysis, while differential geometry focuses on the interplay between analysis and geometry. The importance of all three areas, the influence of each on the others, and the insight to be gained by considering one area from perspectives commonly associated to another one are all emphasized in the mathematics curriculum—as can be seen in the course matrix, many courses involve material from multiple areas.

## Mathematics

### THE MATHEMATICS DEPARTMENT OFFERS THREE TRACKS WITHIN THE MATHEMATICS MAJOR:

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#### **Pure Mathematics**

Students in the Pure Mathematics track often go on to graduate study in mathematics; the pathway emphasizes the importance of a well-rounded, in-depth mathematical education, and includes advanced coursework in algebra, analysis, and geometry.

#### **Computational Mathematics**

Students in the Computational Mathematics track explore applications of mathematics in other fields and gain experience in mathematical modeling of real-world phenomena using ordinary and partial differential equations, approximation and optimization techniques, linear programming, or game theory.

#### **Mathematics Education**

Students in the Mathematics Education track prepare for a career in K-12 mathematics education; students

acquire in-depth knowledge of subjects covered at an introductory level in the classroom, including number theory, classical geometry, and the history of mathematics, and gain experience in teaching mathematics in an accessible and intuitive, but precise, manner.

#### **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 following tables of lower- and upper-division mathematics courses.

Mathematics

	<b>Lower-Division Courses</b>	<b>Critical Thinking</b>	<b>Problem Solving</b>	<b>Communication</b>	<b>Algebra</b>	<b>Analysis</b>	<b>Geometry</b>
MATH 2	College Algebra for Calculus		√		√		
MATH 3	Precalculus		√		√	•	
MATH 4	Mathematics of Choice and Argument	•	√		√		
MATH 11AB	Calculus with Applications		√			√	
<b>MATH 19AB*</b>	Calculus for Science, Engineering, and Mathematics	•	√			√	
<b>MATH 20AB*</b>	Honors Calculus	•	√	•		√	
<b>MATH 21</b>	Linear Algebra		√		√		
MATH 22	Introduction to Calculus of Several Variables		√			√	
<b>MATH 23AB</b>	Vector Calculus	•	√			√	•
<b>MATH 24</b>	Differential Equations		√		•	√	

**Boldface** indicates that a course that is required for at least one of the major pathways.

**Boldface\*** indicates a course that is one of two or three options for satisfying a requirement of one of the major pathways.

√ indicates a course in which the skill or subject is directly addressed, with substantial instruction and assessment emphasis.

• indicates a course in which the skill or subject plays an important role, but is not the primary focus

	<b>Upper-Division Courses</b>	<b>Critical Thinking</b>	<b>Problem Solving</b>	<b>Communication</b>	<b>Algebra</b>	<b>Analysis</b>	<b>Geometry</b>
<b>MATH 100</b>	Introduction to Proof and Problem Solving	√	•	√	•	•	
MATH 101	Mathematical Problem Solving	√	√	√	•	•	•
<b>MATH 103A*B</b>	Complex Analysis	√		√		√	
<b>MATH 105ABC</b>	Real Analysis	√	•	√		√	
<b>MATH 106*</b>	Systems of Ordinary Differential Equations	•	√	•	•	√	•
<b>MATH</b>	Partial		√			√	

Mathematics

	Upper-Division Courses	Critical Thinking	Problem Solving	Communication	Algebra	Analysis	Geometry
<b>107*</b>	Differential Equations						
<b>MATH 110</b>	Introduction to Number Theory	√	•	√	√		
<b>MATH 111AB</b>	Algebra	√	•	√	√		
MATH 114	Introduction to Financial Mathematics	•	√	•	√	•	
MATH 115	Graph Theory	•	√	•	√		
MATH 116	Combinatorics	•	√	•	√		
<b>MATH 117</b>	Advanced Linear Algebra	√	√	•	√		
MATH 118	Advanced Number Theory	√	√	•	√	•	
MATH 120	Coding Theory	•	√	•	√		
MATH <b>121A*B</b>	Differential Geometry	√	•	•		√	√
MATH 124	Introduction to Topology	√	•	•	√	√	
<b>MATH 128A</b>	Classical Geometry: Euclidean and Non-Euclidean	√	√	√			√
MATH 128B	Classical Geometry: Projective	√	√	√			√
MATH 129	Algebraic Geometry	√	•	•	√		√
MATH 130	Celestial Mechanics	•	√	•		√	√
MATH 134	Cryptography	√	√	•	√		
MATH 140	Industrial Mechanics	•	√	√		√	
<b>MATH 145*</b>	Introductory Chaos Theory	•	√	√		√	√
MATH 148	Numerical Analysis	•	√	•	√	√	
MATH 160	Mathematical Logic I	√	•	√			
MATH	Mathematical	√	•	√			

Mathematics

	Upper-Division Courses	Critical Thinking	Problem Solving	Communication	Algebra	Analysis	Geometry
161	Logic II						
<b>MATH 181</b>	History of Mathematics	√	•	√	•	√	•
MATH 188	Supervised Teaching		√	√			
MATH 189	ACE Program Service Learning		•	√	•	•	
<b>MATH 194*</b>	Senior Seminar	√	•	√			
<b>MATH 195*</b>	Senior Thesis	√	•	√			
MATH 199	Tutorial	•	•	•	•	•	•

**Boldface** indicates that a course that is required for at least one of the major pathways.

**Boldface\*** indicates a course that is one of two or three options for satisfying a requirement of one of the major pathways.

√ indicates a course in which the skill or subject is directly addressed, with substantial instruction and assessment emphasis.

• indicates a course in which the skill or subject plays an important role, but is not the primary focus

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## ACADEMIC ADVISING

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Academic advising is available at [the Undergraduate Affairs Office](#). The undergraduate 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 Undergraduate Affairs web site](#) 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 about requirements, course curriculum, and departmental policy.

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## REQUIREMENTS

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Students who plan to take a mathematics course at UCSC must demonstrate sufficient preparation by their score on either the mathematics placement examination (MPE), the College Entrance Examination Board Advanced Placement (AP) calculus examination, the International Baccalaureate Higher Level Mathematics Examination, or by passing the appropriate prerequisite course.

Students who have passed course 2 may enroll in course 3. Students who have passed course 3 may enroll in course 11A or 19A. Students who have passed a precalculus course at a college or university may enroll in course 11A or 19A, but they must first verify eligibility of the course and course completion with the mathematics adviser ([mathadvising@ucsc.edu](mailto:mathadvising@ucsc.edu)).

Transfer students interested in a mathematics or science major should take courses equivalent to course 19A, 19B, and 21 **before** enrolling at UCSC. Courses equivalent to 23A, 23B, and 24 are also recommended before transferring to UCSC.

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## UCSC MATHEMATICS PLACEMENT

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The mathematics placement process is designed to assess student readiness for their first UCSC mathematics class. Students whose areas of study require precalculus or calculus courses are strongly advised to complete placement and any required courses early in their academic careers. Information on registering and taking the placement examination is provided at:

<http://undergrad.pbsci.ucsc.edu/enrollment/math/math-placement/index.html>. Course eligibility cut-offs are listed at:

<http://undergrad.pbsci.ucsc.edu/enrollment/math/math-placement/mp-verify-your-placement.html>.

All students are advised to consult with the department sponsoring their major before deciding which mathematics pathway to take. Many majors in science and engineering require MATH 19A/B.

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## COLLEGE BOARD ADVANCED PLACEMENT CALCULUS EXAMINATIONS

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Students who have received 4 credits for the College Entrance Examination Board Advanced Placement (AP) calculus examination should normally enroll in course 19B, and those with 8 credits should normally enroll in course 23A. However, students who received a score of 3 on the calculus AB or BC AP examination, should enroll in course 19A or 19B, respectively, to improve their knowledge of calculus before continuing their studies. Students who wish to challenge themselves, and who received a score of 4 or 5 on the AB or a score of 3, 4, or 5 on the BC examination may choose course 20A, Honors Calculus. Non-mathematics majors should consult their major departments before enrolling in a mathematics course.

If your AP AB score is	May enroll in this course
3	Mathematics 11A or 19A
4 or 5	Mathematics 20A or 11B or 19B

If your AP BC score is	May enroll in this course
3	Mathematics 11B or 19B or 20A
4 or 5	Mathematics 20A or 22 or 23A

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## INTERNATIONAL BACCALAUREATE HIGHER LEVEL EXAMINATION IN MATHEMATICS

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Students who have received a score of 5, 6, or 7 on the International Baccalaureate (IB) Higher Level Examination in Mathematics may enroll in course 20A, Honors Calculus; 22, Calculus of Several Variables; or 23A, Multivariable Calculus. Non-mathematics majors should consult their major departments before enrolling in a mathematics course.

## DECLARATION OF THE MATHEMATICS MAJOR

Admission to the mathematics major (all concentrations) is contingent on students successfully passing the following introductory courses or their equivalents:

- Mathematics 19A, Calculus for Science, Engineering, and Mathematics
- Mathematics 19B, Calculus for Science, Engineering, and Mathematics
- Mathematics 21, Linear Algebra
- Mathematics 23A, Multivariable Calculus
- Mathematics 23B, Multivariable Calculus
- Mathematics 100, Introduction to Proof and Problem Solving

Students may only declare once they have passed all introductory courses or their equivalent courses with a grade of C or better. Students who receive two grades of NP, C-, D+, D, D-, or F in the introductory courses are not eligible to declare in the major. Students who are not eligible to declare may submit an appeal to the department's undergraduate vice chair. The advising office will subsequently notify the student, and their college, of the decision, no later than 15 business days after the submission of the appeal.

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 Mathematics 100 as early as prerequisites allow in order to decide whether they are interested in upper-division mathematics courses. It is strongly recommended that only students who earn grades of B- or better in Mathematics 100 consider applying to the major in mathematics. Students with a grade less than B in Mathematics 100 are urged to take Mathematics 101.

### MAJOR REQUIREMENTS

#### PURE MATHEMATICS

This concentration is intended for students who desire a comprehensive understanding of mathematics, including those considering graduate studies in the natural sciences. Students are required to complete at least 11 courses (with laboratories, if appropriate).

Eight of these courses must be:

- Mathematics 24, Ordinary Differential Equations;
- Mathematics 100, Introduction to Proof and Problem Solving;
- Mathematics 103A, Complex Analysis;
- Mathematics 105A, Real Analysis;
- Mathematics 111A, Algebra;
- Mathematics 117, Advanced Linear Algebra;
- one of Mathematics 121A, Differential Geometry, Mathematics 124, Introduction to Topology, or Mathematics 128A, Classical Geometry: Euclidean and Non-Euclidean, or Mathematics 129, Algebraic Geometry;
- and either Mathematics 194, Senior Seminar, or Mathematics 195, Senior Thesis.

The remaining three courses are selected by the student from among any mathematics course numbered above 100 (excluding Mathematics 188 and Mathematics 189) and Applied Mathematics and Statistics (AMS) 100 or above. Only one of the three courses can be from the AMS series.

A typical program for a pure mathematics major might include the following:

1st year	Mathematics 20A-B or 19A-B, 21, 23A
2nd year	Mathematics 23B, 24, 100, 103A, 110 or 128A
3rd year	Mathematics 105A-B, 111A-B, 106
4th year	Mathematics 107, 117, 121A, 194 or 195

The first two years of a typical program for a pure mathematics major who begins mathematics studies with precalculus might include the following:

1st year	Mathematics 3, 19A-B, 21
2nd year	Mathematics 23A-B, 24, 100, 103A or 128A

#### COMPUTATIONAL MATHEMATICS

This concentration is intended to prepare students for technical careers in industry or government while providing a solid mathematical background. Students are required to complete a minimum of eight mathematics courses (with laboratories, if appropriate) as follows:

- Mathematics 24, Ordinary Differential Equations;
- Mathematics 100, Introduction to Proof and Problem Solving;
- Mathematics 103A, Complex Analysis, or Mathematics 105A, Real Analysis;
- Mathematics 106, Systems of Ordinary Differential Equations, or Mathematics 107, Partial Differential Equations;
- Mathematics 110, Introduction to Number Theory;

## Mathematics

- Mathematics 111A, Algebra, or Mathematics 117, Advanced Linear Algebra;
- Mathematics 106, Systems of Ordinary Differential Equations, or Mathematics 145, Introductory Chaos Theory, or Applied Mathematics and Statistics 114, Introduction to Dynamical Systems;
- and either Mathematics 194, Senior Seminar, or Mathematics 195, Senior Thesis.

In addition, students must complete two courses selected from the following:

- Applied Mathematics and Statistics, 100 or above
- Biomolecular Engineering 110
- Computer Engineering 107, 108, 153, 177
- Computer Science 101, 102, 104A, 109, 112, 130, 132, 142
- Earth and Planetary Sciences 172
- Economics 113
- Electrical Engineering 103, 130, 135, 151, 154
- Physics 115

Some of these courses have prerequisites within their departments. Students are encouraged to plan their computational electives early, so that all prerequisites can be satisfied in a timely manner. Other upper-division courses with heavy emphasis on computational mathematics may occasionally be accepted with permission of the Mathematics Department.

Mathematics majors who wish to enroll in Computer Science 101 should contact the instructor to request a permission code.

A typical program for a computational mathematics major might include the following:

1st year	19A-B, 23A, CMPS 12A/L and 12B/M
2nd year	21, 23B, 24, 100, 110, CMPE 16
3rd year	103A, 105A, 145/L or AMS 147, CMPS 101
4th year	106, 111A, CMPS 109, 194

### MATHEMATICS EDUCATION

This concentration is intended to prepare students for teaching kindergarten through high school (K-12) mathematics. Students are required to complete the following 10 courses:

- Applied Mathematics and Statistics 5, Statistics
- Mathematics 100, Introduction to Proof and Problem Solving;
- either Mathematics 103A, Complex Analysis, or 105A, Real Analysis;
- Mathematics 110, Introduction to Number Theory;
- Mathematics 111A, Algebra;
- Mathematics 128A, Classical Geometry: Euclidean and Non-Euclidean;

- Applied Mathematics and Statistics 131, Introduction to Probability Theory;
- Mathematics 181, History of Math;
- Either Mathematics 188, Supervised Teaching Experience; or Education 50B, CalTeach 1: Mathematics, plus Education 100B, CalTeach 2: Mathematics
- and either Mathematics 194, Senior Seminar, or Mathematics 195, Senior Thesis.

UCSC students can pursue a degree in mathematics while preparing to teach at the secondary level. In California, students seeking a single-subject credential (for secondary teaching) in mathematics are required to take the CSET, a series of examinations that must be passed in order to enter a teaching-credential program (formerly The National Teachers Examination). Students who complete the mathematics education track, plus three additional specified courses, qualify for the California Single Subject Program, exempting themselves from the CSET. Both the Mathematics Department undergraduate adviser and the Education Department advising office have more information about the additional required courses for the Subject Matter Program.

A typical program for a mathematics education major might include the following:

1st year	Mathematics 19A-B, 21, 23A
2nd year	Mathematics 23B, 100; Applied Mathematics and Statistics 5
3rd year	Mathematics 101, 103A, 110, 181; Applied Mathematics and Statistics 131
4th year	Mathematics 111A, 128A, 188, 194

The first two years of a typical program for a mathematics education major who begins mathematics studies with precalculus might include the following:

1st year	Mathematics 3, 19A-B, 21
2nd year	Mathematics 23A-B, 100; Applied Mathematics and Statistics 5

### 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

## Mathematics

satisfied by Mathematics 100, Introduction to Proof and Problem Solving, and either Mathematics 194, Senior Seminar, or Mathematics 195, Senior Thesis.

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### HONORS

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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.

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### MINOR REQUIREMENTS

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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 eight courses as follows:

- Mathematics 21, Linear Algebra;
- Mathematics 23A, Vector Calculus; and
- Mathematics 23B, Vector Calculus;
- Mathematics 100
- and any four mathematics courses numbered above 100.

No senior seminar or thesis is required.

A typical mathematics minor program for a physics major might be:

1st year	Mathematics 19A-B, 23A
2nd year	Mathematics 21, 23B, 100
3rd year	Mathematics 103A, 121A or 124
4th year	Mathematics 117, 145 or Applied Mathematics and Statistics 114

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### COMBINED MAJORS

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#### ECONOMICS AND MATHEMATICS

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The combined 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 a modern economics Ph.D. program, or for

technically demanding professional careers. A full description can be found in the economics section of this catalog. The combined major, requiring fewer courses than a double major, is administered through the Economics Department.

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### GRADUATE PROGRAM

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The Mathematics Department offers programs leading to the master of arts (M.A.) and doctor of philosophy (Ph.D.) degrees. Contact the Division of Graduate Studies for further information on the M.A. and Ph.D. programs, as well as on university application procedures.

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#### M.A. DEGREE REQUIREMENTS

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Students are required to complete two of Mathematics 200, 201, 202, 203; two of Mathematics 204, 205, 206; one of Mathematics 208, 209, 210; and complete five additional courses in mathematics or a related subject by approval. In addition, students must do one of the following:

- obtain a second-level pass on one of three written preliminary examinations;
- write a master's thesis.

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#### PH.D. DEGREE REQUIREMENTS

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All of the following are required:

- 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 course sequence in the track associated with the preliminary examination in which they did not achieve a first-level pass;
- satisfy the foreign-language requirement;
- pass the oral qualifying examination;
- complete three quarters as a teaching assistant;
- complete six graduate courses in mathematics other than Mathematics 200, 201, 202, 204, 205, 206, 208, 209, and 210. No more than three courses may be independent study or thesis research courses;
- write a Ph.D. thesis.

Students admitted to the Ph.D. program may receive an M.A. degree en route to the Ph.D.

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### COURSE INFORMATION

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Mathematics 2, College Algebra for Calculus, is designed for students who do not meet the requirements for admission to Mathematics 3, Precalculus, and who need comprehensive and careful preparation for calculus. Mathematics 2 emphasizes algebra, graphs, and functions.

## Mathematics

Mathematics 3, Precalculus, is recommended for students who need some preparation in algebra and trigonometry prior to taking calculus. This course covers functions and their inverse, exponentials, logarithms, and trigonometry.

Mathematics 11A and 11B, Calculus with Applications, are intended for biology and Earth sciences majors. However, students in these majors who score 400 or more points on the mathematics placement examination are strongly encouraged to take the 19A-B sequence, which is required for most upper-division mathematics courses. Laboratory sections are strongly advised.

Mathematics 19A and 19B, Calculus for Science, Engineering, and Mathematics, are intended for chemistry, computer engineering, computer science, electrical engineering, information systems management, mathematics, and physics majors. Laboratory sections are strongly advised.

Mathematics 20A and 20B, Honors Calculus, are intended for students who would enjoy delving particularly deeply into the foundational and theoretical issues of calculus. Laboratory sections are strongly advised.

Mathematics 21, Linear Algebra, covers vector spaces, matrices, determinants, systems of linear equations, and eigenvalues. It is intended for students in the physical and biological and social sciences and is prerequisite to Mathematics 111A.

Mathematics 22, Introduction to Calculus of Several Variables, is intended for science students whose schedules do not permit a full and comprehensive two quarters of multivariable calculus. Students who intend to pursue further studies in mathematics must take Mathematics 23A-B and not 22. Laboratory sections are strongly advised.

Mathematics 23A and 23B, Vector Calculus, are intended for mathematics majors and minors and students in computer engineering, computer science, electrical engineering, information systems management, and physics majors which require more rigorous mathematical training. Laboratory sections are strongly advised.

Mathematics 100, Introduction to Proof and Problem Solving, is an introduction to the methodology of advanced mathematics, emphasizing proof techniques. Basic areas such as set theory and logic are introduced, together with extensive applications within mathematics. This course serves as a prerequisite for nearly all upper-division courses and partially fulfills the Disciplinary Communication (DC) requirement.

Mathematics 200+, Graduate-level courses. All graduate courses are open to undergraduates who have taken the recommended prerequisites; students should consult with the course instructor. Advanced undergraduates are strongly advised to take or audit graduate courses that interest them.

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## MATHEMATICS FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**Robert Boltje**

Group theory, representation theory, algebraic number theory

**Bruce N. Cooperstein**

Groups of Lie type, incidence geometry

**Chongying Dong**

Infinite-dimensional Lie algebras and their representations, conformal field theory

**Torsten Ehrhardt**

Functional analysis, Operator theory, Random matrix theory, Banach algebras, Wiener-Hopf factorization, Toeplitz and Hankel operators

**Viktor Ginzburg**

Global analysis, symplectic topology; Hamiltonian dynamical systems, Poisson geometry, symmetries, and group actions

**Debra Lewis**

Geometric Hamiltonian mechanics, geometric integration, bifurcation theory, applications of variational methods, control theory

**Geoffrey Mason**

Vertex operator algebras and applications to conformal field theory and string theory; modular forms; group theory; quasi-Hopf algebras

**Richard Montgomery**

Celestial mechanics, differential geometry, gauge theory, mechanics (quantum and classical), and singularity theory

**Jie Qing**

Nonlinear analysis, harmonic analysis, partial differential equations with applications to differential geometry, mathematical physics

**Hirotsuka Tamanoi**

Algebraic topology, string topology, topological quantum field theory, mathematical aspects of string theory

## Mathematics

### **Anthony J. Tromba**

Global nonlinear analysis, calculus of variations, minimal surfaces and Plateau's problem, Riemann surfaces

ASSOCIATE PROFESSOR

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### **Samit Dasgupta**

Algebraic number theory, arithmetic geometry, special values of L-functions

### **Martin H. Weissman**

Representation theory, automorphic forms, number theory

ASSISTANT PROFESSOR

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### **Longzhi Lin**

Geometric analysis and geometric partial differential equations

### **Junecue Suh**

Number theory and arithmetic algebraic geometry

## EMERITI

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### **Ralph H. Abraham**

### **Nicholas Burgoyne**

### **Arthur E. Fischer**

### **Marvin J. Greenberg**

### **Al Kelley**

### **Edward M. Landesman**

### **Tudor S. Ratiu**

### **Gerhard Ringel**

### **Maria Schonbek**

### **Marshall Sylvan**

### **Harold Widom**

LECTURER

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### **Frank Bäuerle**

### **Abraham Berman**

### **Nandini Bhattacharya**

### **Mark R. Eastman**

### **Yonatan Katznelson**

### **Edward Migliore**

### **Richard R. Mitchell**

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## MATHEMATICS COURSES

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### LOWER-DIVISION COURSES

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#### **2. College Algebra for Calculus.**

**F**

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(s): mathematics placement examination (MPE) score of 100 or higher. The Staff

#### **2S. College Algebra for Calculus (2 credits). \***

This two-credit, stretch course offers students two quarters to master material covered in course 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 course 2 the following quarter to complete the sequence and earn an additional 5 credits. Prerequisite(s): mathematics placement examination (MPE) score of 100 or higher. N. Bhattacharya, The Staff

#### **3. Precalculus. F,W,S**

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 course 3 and Applied Mathematics and Statistics

3. Applied Mathematics and Statistics 3 can substitute for course 3. Prerequisite(s): course 2 or mathematics placement examination (MPE) score of 200 or higher. (General Education Code(s): MF, Q.) The Staff

#### **4. Mathematics of Choice and Argument. \***

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(s): course 2, or mathematics placement examination (MPE) score of 200 or higher, or AP Calculus AB examination score of 3 or higher. (General Education Code(s): SR, Q.) The Staff

## Mathematics

### **11A. Calculus with Applications. F,W,S**

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 course 19A or Applied Mathematics and Statistics 11A and 15A, or Economics 11A.

Prerequisite(s): course 3 or Applied Mathematics and Statistics 3; or mathematics placement examination (MPE) score of 300 or higher; or AP Calculus AB exam score of 3 or higher. (General Education Code(s): MF, IN, Q.) The Staff

### **11B. Calculus with Applications. F,W,S**

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 course 19B, or Applied Mathematics and Statistics 11B and 15B, or Economics 11B. Prerequisite(s): course 11A or 19A or Applied Mathematics and Statistics 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. (General Education Code(s): MF, IN, Q.) The Staff

### **19A. Calculus for Science, Engineering, and Mathematics. F,W,S**

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 course 11A or Applied Mathematics and Statistics 11A and 15A, or Economics 11A. Prerequisite(s): course 3 or Applied Mathematics and Statistics 3; or mathematics placement examination (MPE) score of 400 or higher; or AP Calculus AB exam score of 3 or higher. (General Education Code(s): MF, IN, Q.) The Staff

### **19B. Calculus for Science, Engineering, and Mathematics. F,W,S**

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 course 11B, Applied Math and Statistics 11B and 15B, or Economics 11B. Prerequisite(s): course 19A 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 of higher. (General Education Code(s): MF, IN, Q.) The Staff

### **20A. Honors Calculus. F**

Challenging course designed to approach single-variable calculus from the perspective of modern mathematics. Emphasis is on the evolution and historical development of core concepts underlying calculus and analysis. Prerequisite(s): mathematics placement examination (MPE) 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. Enrollment limited to 60. (General Education Code(s): MF, IN, Q.) The Staff

### **20B. Honors Calculus. W**

Challenging course designed to approach single-variable calculus from the perspective of modern mathematics. Emphasis is on the evolution and historical development of core concepts underlying calculus and analysis. Prerequisite(s): course 20A. Enrollment limited to 60. (General Education Code(s): MF, IN, Q.) The Staff

### **21. Linear Algebra. F,W,S**

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 Applied Mathematics and Statistics 10 or 10A. Prerequisite(s): Mathematics 11A or 19A or 20A or Applied Mathematics and Statistics 11A or 15A. (General Education Code(s): MF, Q.) The Staff

### **22. Introduction to Calculus of Several Variables. W**

Functions of several variables. Continuity and partial derivatives. The chain rule, gradient and directional derivative. Maxima and

## Mathematics

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 course 23A. Prerequisite(s): course 11B or 19B or 20B or Applied Mathematics and Statistics 15B or AP calculus BC exam score of 4 or 5. (General Education Code(s): MF.) The Staff

### **23A. Vector Calculus. F,W,S**

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 course 22. (Formerly Multivariable Calculus.) Prerequisite(s): course 19B or 20B or AP calculus BC exam score of 4 or 5. (General Education Code(s): MF.) The Staff

### **23B. Vector Calculus. F,W,S**

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. (Formerly Multivariable Calculus.) Prerequisite(s): course 23A. (General Education Code(s): MF.) The Staff

### **24. Ordinary Differential Equations. S**

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 Applied Mathematics and Statistics 20. Prerequisite(s): course 22 or 23A; course 21 is recommended as preparation. The Staff

### **99. Tutorial. F,W,S**

The Staff

### **99F. Tutorial (2 credits). F,W,S**

May be repeated for credit. The Staff

## UPPER-DIVISION COURSES

### **100. Introduction to Proof and Problem Solving. F,W,S**

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(s): satisfaction of the Entry Level Writing and Composition requirements; courses 11A and 11B or 19A and 19B or 20A and 20B. Enrollment limited to 80. (General Education Code(s): MF.) The Staff

### **101. Mathematical Problem Solving. F**

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. (Formerly, course 30.) Prerequisite(s): courses 21 and 100. (General Education Code(s): PR-E.) The Staff

### **103A. Complex Analysis. W,S**

Complex numbers, analytic and harmonic functions, complex integration, the Cauchy integral formula, Laurent series, singularities and residues, conformal mappings. (Formerly course 103.) Prerequisite(s): course 23B; and either course 100 or Computer Science 101. The Staff

### **103B. Complex Analysis II (2 credits). \***

Conformal mappings, the Riemann mapping theorem, Mobius transformations, Fourier series, Fourier and Laplace transforms, applications, and other topics as time permits. Prerequisite(s): course 103A. The Staff

### **105A. Real Analysis. F,W**

The basic concepts of one-variable calculus are treated rigorously. Set theory, the real number system, numerical sequences and series, continuity, differentiation. Prerequisite(s): course 22 or 23B and either course 100 or Computer Science 101. The Staff

### **105B. Real Analysis. S**

Metric spaces, differentiation and integration of functions. The Riemann-Stieltjes integral. Sequences and series of functions. Prerequisite(s): course 105A. The Staff

### **105C. Real Analysis. \***

The Stone-Weierstrass theorem, Fourier series, differentiation and integration of functions of several variables. Prerequisite(s): course 105B. The Staff

**106. Systems of Ordinary Differential Equations. S**

Linear systems, exponentials of operators, existence and uniqueness, stability of equilibria, periodic attractors, and applications. (Formerly course 106A.) Prerequisite(s): courses 21 and 24 (preferred) or Applied Mathematics and Statistics 10 and 20; and either course 100 or Computer Science 101. The Staff

**107. Partial Differential Equations. W**

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. (Formerly course 106B.) Prerequisite(s): courses 21 and 24 (preferred) or Applied Mathematics and Statistics 10 and 20; and either course 100 or Computer Science 101; course 106 is recommended as preparation. The Staff

**110. Introduction to Number Theory. F,W**

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(s): course 100 or Computer Science 101. (General Education Code(s): Q.) The Staff

**111A. Algebra. F,W**

Group theory including the Sylow theorem, the structure of abelian groups, and permutation groups. Prerequisite(s): course 21 or Applied Mathematics and Statistics 10 and either course 100 or Computer Science 101. The Staff

**111B. Algebra. S**

Introduction to rings and fields including polynomial rings, factorization, the classical geometric constructions, and Galois theory. Prerequisite(s): course 111A. The Staff

**114. Introduction to Financial Mathematics. \***

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. Corequisite(s): Applied Mathematics and Statistics 131 or Computer Engineering 107. The Staff

**115. Graph Theory. W**

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(s): course 21 or Applied Mathematics and Statistics 10 and either course 100 or Computer Science 101. The Staff

**116. Combinatorics. \***

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(s): course 100. Enrollment restricted to sophomores juniors, and seniors. Familiarity with basic group theory recommended. The Staff

**117. Advanced Linear Algebra. F**

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(s): course 21 or Applied Mathematics and Statistics 10 and either course 100 or Computer Science 101. The Staff

**118. Advanced Number Theory. \***

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(s): course 110 or 111A. The Staff

**120. Coding Theory. \***

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(s): course 21. The Staff

**121A. Differential Geometry. F**

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

## Mathematics

shape operator. Gaussian and mean curvature. The theorem Egregium; global classification of surfaces in three space by curvature.

Prerequisite(s): courses 21 and 23B and either course 100 or Computer Science 101. Course 105A strongly recommended. The Staff

### **121B. Differential Geometry and Topology. \***

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(s): course 121A. The Staff

### **124. Introduction to Topology. F**

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(s): course 100; course 111A recommended. The Staff

### **128A. Classical Geometry: Euclidean and Non-Euclidean. S**

Rigorous foundations for Euclidean and non-Euclidean geometries. History of attempts to prove the parallel postulate and of the simultaneous discovery by Gauss, J. Bolyai, and Lobachevsky of hyperbolic geometry. Consistency proved by Euclidean models. Classification of rigid motions in

both geometries. Prerequisite(s): either course 100 or Computer Science 101. The Staff

### **128B. Classical Geometry: Projective. \***

Theorems of Desargue, Pascal, and Pappus; projectivities; homogeneous and affine coordinates; conics; relation to perspective drawing and some history. Prerequisite(s): course 21. The Staff

### **129. Algebraic Geometry. \***

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(s): courses 21 and 100. Enrollment limited to 40. The Staff

### **130. Celestial Mechanics. \***

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(s): courses 19A-B and course 23A or Physics 5A or 6A; courses 21 and 24 strongly recommended. Enrollment limited to 35. The Staff

### **134. Cryptography. S**

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(s): course 100; course 110 recommended as preparation. The Staff

### **140. Industrial Mathematics. \***

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(s): course 24 and either course 100 or Computer Science 101, and course 105A. The Staff

### **145. Introductory Chaos Theory. \***

The Lorenz and Rossler attractors, measures of chaos, attractor reconstruction, and applications from the sciences. Students cannot receive credit for this course and Applied Mathematics and Statistics 114. Prerequisite(s): course 22 or 23A; course 21; course 100 or Computer Science 101. Concurrent enrollment in course 145L is required. The Staff

### **145L. Introductory Chaos Laboratory (1 credit). \***

Laboratory sequence illustrating topics covered in course 145. One three-hour session per week in microcomputer laboratory. Concurrent enrollment in course 145 is required. The Staff

### **148. Numerical Analysis. \***

The theory of constructive methods in mathematical analysis and its application with scientific computation. Some typical topics are difference equations, linear

## Mathematics

algebra, iteration, Bernoulli's method, quotient difference algorithm, the interpolating polynomial, numerical differentiation and integration, numerical solution of differential equations, finite Fourier series. Prerequisite(s): course 22 or 23A; course 21 and 24 or Applied Mathematics and Statistics 10 and 20; course 100 or Computer Science 101. Concurrent enrollment in course 148L is required. The Staff

### **148L. Numerical Analysis Laboratory (1 credit). \***

Laboratory sequence illustrating topics covered in course 148. One three-hour session per week in microcomputer laboratory. Concurrent enrollment in course 148 is required. The Staff

### **160. Mathematical Logic I. \***

Propositional and predicate calculus. Resolution, completeness, compactness, and Lowenheim-Skolem theorem. Recursive functions, Godel incompleteness theorem. Undecidable theories. Hilbert's 10th problem. Prerequisite(s): course 100 or Computer Science 101. The Staff

### **161. Mathematical Logic II. \***

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(s): course 100 or equivalent, or by permission of instructor. Enrollment limited to 45. The Staff

### **181. History of Mathematics. W**

A survey from a historical point of view of various developments in mathematics. Specific topics and periods to vary yearly. Prerequisite(s): course 19B or 20B. Course 100 strongly recommended for preparation. (General Education Code(s): TA.) The Staff

### **188. Supervised Teaching. F,W,S**

Supervised tutoring in self-paced courses. May not be repeated for credit. Students submit petition to sponsoring agency. (General Education Code(s): PR-S.) The Staff

### **189. ACE Program Service Learning (2 credits). F**

Students participate in training and development to co-facilitate collaborative learning in ACE chemistry discussion sections and midterm/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 restricted to sophomores, juniors, and seniors. Enrollment limited to 10. (General Education Code(s): PR-S.) The Staff

### **194. Senior Seminar. W,S**

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(s): satisfaction of the Entry Level Writing and Composition requirements; course 103 or 103A or 105A or 111A. Enrollment is priority given to seniors; juniors may request permission from the Undergraduate Vice Chair. The Staff

### **195. Senior Thesis. F,W,S**

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. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## GRADUATE COURSES

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### **200. Algebra I. F**

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): courses 111A and 117 are recommended as preparation. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **201. Algebra II. W**

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.

## Mathematics

Prerequisite(s): Course 200 is recommended as preparation. Enrollment restricted to graduate students. The Staff

### **202. Algebra III. S**

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(s): Course 201 is recommended as preparation. Enrollment restricted to graduate students. The Staff

### **203. Algebra IV. \***

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(s): courses 200, 201, and 202. Enrollment restricted to graduate students. The Staff

### **204. Analysis I. F**

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(s): courses 105A and

105B are recommended as preparation. Enrollment restricted to graduate students. The Staff

### **205. Analysis II. W**

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. Lp spaces, derivative of a measure, the Radon-Nikodym theorem, and the fundamental theorem of calculus. Prerequisite(s): course 204. Enrollment restricted to graduate students. The Staff

### **206. Analysis III. S**

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(s): Courses 204 and 205 recommended as preparation. Enrollment restricted to graduate students. The Staff

### **207. Complex Analysis. W**

Holomorphic and harmonic functions, Cauchy's integral theorem, the maximum principle and its consequences, conformal mapping, analytic continuation, the Riemann mapping theorem. Prerequisite(s): Course 103 is recommended as preparation. Enrollment restricted to graduate students. The Staff

### **208. Manifolds I. F**

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. Course 204 recommended for preparation. Enrollment restricted to graduate students. The Staff

### **209. Manifolds II. W**

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(s): course 208. Course 201 is recommended as preparation. Enrollment restricted to graduate students. The Staff

### **210. Manifolds III. S**

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(s): Courses 208 and 209 recommended as preparation. Enrollment restricted to graduate students. The Staff

### **211. Algebraic Topology. \***

Continuation of course 210. Topics include theory of characteristic classes of vector bundles, cobordism theory, and homotopy theory. Prerequisite(s): Courses 200, 201, and 202 recommended as preparation. Enrollment restricted to graduate students. The Staff

**212. Differential Geometry. F**

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(s): course 208.

Enrollment restricted to graduate students. The Staff

**213A. Partial Differential Equations I. W**

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. Courses 106 and 107 are recommended as preparation. Enrollment restricted to graduate students. The Staff

**213B. Partial Differential Equations II. \***

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(s): Courses 106, 107, and 213A are recommended as preparation. Enrollment restricted to graduate students. The Staff

**214. Theory of Finite Groups. \***

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(s): Courses 200 and 201 recommended as preparation. Enrollment restricted to graduate students. The Staff

**215. Operator Theory. \***

Operators on Banach spaces and Hilbert spaces. The spectral theorem. Compact and Fredholm operators. Other special classes of operators. Prerequisite(s): Courses 204, 205, 206, and 207 are recommended as preparation. Enrollment restricted to graduate students. The Staff

**216. Advanced Analysis. \***

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(s): Courses 204, 205, and 206 recommended as preparation. Enrollment restricted to graduate students. The Staff

**217. Advanced Elliptic Partial Differential Equations. \***

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(s): Courses 204, 205, and 206 recommended as preparation. Enrollment restricted to graduate students. The Staff

**218. Advanced Parabolic and Hyperbolic Partial Differential Equations. \***

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(s): courses 205 and 206. Enrollment restricted to graduate students. The Staff

**219. Nonlinear Functional Analysis. \***

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. Enrollment restricted to graduate students. The Staff

**220A. Representation Theory I. S**

Lie groups and Lie algebras, and their finite dimensional representations. Prerequisite(s): courses 200, 201, and 202. Courses 225A and 227 recommended as preparation. Enrollment restricted to graduate students. The Staff

**220B. Representation Theory II. \***

Lie groups and Lie algebras, and their finite dimensional representations. Prerequisite(s): course 220A. Enrollment restricted to graduate students. The Staff

**222A. Algebraic Number Theory. F**

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. Courses 200, 201, and 202 are recommended as preparation. Enrollment restricted to graduate students. The Staff

**222B. Algebraic Number Theory. W**

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. Enrollment restricted to graduate students. The Staff

**223A. Algebraic Geometry I. W**

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. Courses 200, 201, 202, and 208 are recommended as preparation. Enrollment restricted to graduate students. The Staff

**223B. Algebraic Geometry II. S**

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. Course 223A is recommended as preparation. Enrollment restricted to graduate students. The Staff

**225A. Lie Algebras. W**

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(s): Courses 201 and 202 recommended as preparation. Enrollment restricted to graduate students. The Staff

**225B. Infinite Dimensional Lie Algebras. \***

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(s): course 225A. Enrollment restricted to graduate students. The Staff

**226A. Infinite Dimensional Lie Algebras and Quantum Field Theory I. \***

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. Enrollment restricted to graduate students. The Staff

**226B. Infinite Dimensional Lie Algebras and Quantum Field Theory II. \***

Continuation of course 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. Enrollment restricted to graduate students. The Staff

**227. Lie Groups. W**

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(s): courses 200, 201, 204, and 208. Enrollment restricted to graduate students. The Staff

**228. Lie Incidence Geometries. \***

Linear incidence geometry is introduced. Linear and classical groups are reviewed, and geometries associated with projective and polar spaces are introduced. Characterizations are obtained. Enrollment restricted to graduate students. The Staff

**229. Kac-Moody Algebras. F**

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. Enrollment restricted to graduate students. The Staff

**232. Morse Theory. S**

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(s): Courses 208, 209, 210, 211, and 212 recommended as preparation. Enrollment restricted to graduate students. The Staff

**233. Random Matrix Theory. S**

Classical matrix ensembles; Wigner semi-circle law; method of moments. Gaussian ensembles.

## Mathematics

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(s): courses 103, 204, and 205; course 117 recommended as preparation. Enrollment restricted to graduate students. The Staff

### **234. Riemann Surfaces. F**

Riemann surfaces, conformal maps, harmonic forms, holomorphic forms, the Riemann-Roch theorem, the theory of moduli. Enrollment restricted to graduate students. The Staff

### **235. Dynamical Systems**

#### **Theory. F**

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(s): courses 203 and 208. Enrollment restricted to graduate students. The Staff

### **238. Elliptic Functions and Modular Forms. \***

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(s): courses 200, 201, 202, and either 207 or 103A are

recommended as preparation. Enrollment restricted to graduate students. The Staff

### **239. Homological Algebra. \***

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. Courses 200 and 202 strongly recommended. Enrollment restricted to graduate students. The Staff

### **240A. Representations of Finite Groups I. \***

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 courses 200-202. Enrollment restricted to graduate students. The Staff

### **240B. Representations of Finite Groups II. \***

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 courses 200-203 and 240A. Prerequisite(s): Courses 200, 201, 202, 203, and 240A recommended. Enrollment restricted to graduate students. The Staff

### **246. Representations of Algebras. \***

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(s): courses 200, 201, and 202. Enrollment restricted to graduate students. The Staff

### **248. Symplectic Geometry. \***

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(s): course 204; courses 208 and 209 are recommended as preparation. Enrollment restricted to graduate students. The Staff

### **249A. Mechanics I. \***

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-

## Mathematics

Jacobi theory, godesic equations, and an introduction to Poisson geometry. Courses 208 and 209 are recommended as preparation. Courses 208 and 209 recommended as preparation. Enrollment restricted to graduate students. The Staff

### **249B. Mechanics II. \***

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. Course 249A is recommended as preparation. Enrollment restricted to graduate students. The Staff

### **249C. Mechanics III. \***

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. Course 249B is recommended as preparation. Enrollment restricted to graduate students. Offered in alternate academic years. The Staff

### **252. Fluid Mechanics. \***

First covers a basic introduction to fluid dynamics equations and then focuses on different aspects of the solutions to the Navier-Stokes equations. Prerequisite(s): courses 106 and 107 are recommended as preparation. Enrollment restricted to graduate students. The Staff

### **254. Geometric Analysis. S**

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. Courses 204, 205, 209, 212, and 213 recommended as preparation. Enrollment restricted to graduate students. The Staff

### **256. Algebraic Curves. \***

Introduction to compact Riemann surfaces and algebraic geometry via an in-depth study of complex algebraic curves. Courses 200, 201, 202, 203, 204, and 207 are recommended as preparation. Enrollment restricted to graduate mathematics and physics students. The Staff

### **260. Combinatorics. \***

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. Enrollment restricted to graduate students. The Staff

### **280. Topics in Analysis. \***

Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **281. Topics in Algebra. \***

Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **282. Topics in Geometry. \***

Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **283. Topics in Combinatorial Theory. \***

Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **284. Topics in Dynamics. \***

Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **285. Topics in Partial Differential Equations. \***

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. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **286. Topics in Number Theory. \***

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. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **287. Topics in Topology. \***

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. Enrollment restricted to graduate students. May be repeated for credit. The Staff

### **292. Seminar (no credit). F,W,S**

A weekly seminar attended by faculty, graduate students, and upper-division undergraduate

## Mathematics

students. All graduate students are expected to attend. Enrollment restricted to graduate students. The Staff

### **296. Special Student Seminar. F,W,S**

Students and staff studying in an area where there is no specific course offering at that time.

Enrollment restricted to graduate students. The Staff

### **297. Independent Study. F,W,S**

Either study related to a course being taken or a totally independent study. Enrollment restricted to graduate students. The Staff

### **298. Master's Thesis Research. F,W,S**

Enrollment restricted to graduate students. The Staff

### **299. Thesis Research. F,W,S**

Enrollment restricted to graduate students. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# MERRILL COLLEGE

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2015-16 General Catalog

College Office  
(831) 459-2144  
[merrill.ucsc.edu](http://merrill.ucsc.edu)

For college description and list of faculty, see [Colleges](#).

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## MERRILL COLLEGE COURSES

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### LOWER-DIVISION COURSES

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#### **10. Becoming a Successful Student (2 credits). W**

An interactive course providing 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 explored. Contact college office for interview-only criteria. Enrollment limited to 30. The Staff

#### **20N. Re-Evaluation Counseling.\***

Class introduces the fundamentals of re-evaluation counseling (co-counseling) and focuses on those aspects of the theory and practice which facilitate living in a diverse world. Interview with instructor before first class meeting. Enrollment limited to 20. Offered in alternate academic years. P. Roby

#### **28. Peer Leadership in Co-Curricular Settings (2 credits). S**

Introductory course for student leaders combining theoretical background and practical applications. Topics include: student-development theory; communication strategies; leadership-skills assessment; and intergroup relations. Includes readings, discussions, self-reflection, and lectures. Resident assistant (RA) pre-employment

training course. Enrollment by interview only: approval of instructor required. Enrollment restricted to selection as resident assistant (RA), program assistant, or alternate for Merrill College. Enrollment limited to 30. May be repeated for credit. The Staff

#### **42. Student-Directed Seminar. F,W,S**

Seminars taught by upper-division students under faculty supervision. (See course 192.) The Staff

#### **80A. Introduction to University Discourse: Cultural Identities and Global Consciousness. F**

Explores rhetorical principles and conventions of university discourse, providing intensive practice in analytical writing, critical reading, and speaking. Examines world poverty, imperialism, and nationalism; peoples' need to assert their cultural identities; and the benefits of individuals' absorption in worthy causes. Students cannot receive credit for this course and course 80B. Enrollment restricted to first-year college members who have not satisfied the C1 requirement. (General Education Code(s): T3-Social Sciences, C1, E.) The Staff

#### **80B. Rhetoric and Inquiry: Cultural Identities and Global Consciousness. F**

Explores the intersections of investigation, interpretation, and persuasion and hones strategies for

writing and research. Examines world poverty, imperialism, and nationalism; peoples' need to assert their cultural identities; and the benefits of individuals' absorption in worthy causes. Incorporates outside research. Students cannot receive credit for this course and course 80A. Prerequisite(s): satisfaction of the Entry Level Writing and C1 requirements. Enrollment restricted to first-year college members. (General Education Code(s): T3-Social Sciences, C2, E.) The Staff

#### **80C. Merrill Seminar. W,S**

Research-based seminar on a topic of particular cultural, historical, or contemporary interest, open to all undergraduate students, taught by either a Merrill College Fellow or other member of the UCSC faculty. (General Education Code(s): T5-Humanities and Arts or Social Sciences.) The Staff

#### **80F. Communicating Cultural Consciousness (2 credits). F**

Examines cultural identity within the context of larger global forces. Uses one in-depth study as a model and the daily news. Students work together in groups to develop multimodal projects that communicate cultural consciousness. Enrollment is restricted to first-year Merrill students who have been placed in the Multilingual Curriculum. Enrollment limited to 22. (General Education Code(s): PR-E.) E.

**83F. Topics in Foreign Policy (2 credits). \***

Students read and evaluate mainstream and Internet media sources on foreign-policy topics of interest to them, and learn the craft of writing news columns--writing for a public audience--on their chosen foreign-policy topics. Prerequisite(s): Satisfaction of the college core course. Merrill students are offered first priority. Enrollment limited to 25. C. Hallinan

**85B. Merrill Classroom Connection Field Study (3 credits). F,W,S**

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. Priority enrollment restricted to Merrill College members. May be repeated for credit. (General Education Code(s): PR-S.) The Staff

**85C. Merrill Classroom Connection Field Study (2 credits). F,W,S**

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. Priority enrollment restricted to Merrill College members. May be repeated for credit. (General Education Code(s): PR-S.) The Staff

**90. Theory and Practice of Field Study. S**

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. Enrollment is restricted to first-year, Challenge Program participants from Stevenson College, Merrill College, Porter College, and Kresge College. Enrollment limited to 25. (General Education Code(s): PR-S.) M. Rotkin

**90F. Merrill Field Study Practicum (2 credits). F,W,S**

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. Enrollment restricted to sophomore, junior, and senior college members. Enrollment limited to 30. (General Education Code(s): PR-S.) M. Rotkin

**91F. Challenge Speakers Colloquium (2 credits). F**

Eight lectures, six by faculty about research problems in their disciplines. Students attend two dinners with the speakers; respond to research papers in each speaker's field; conduct a research interview with a professor; and investigate a research question. (Also offered as Porter College 91F. Students cannot receive credit for both courses.) Prerequisite(s): course 90, or Stevenson 90, or Kresge 90A, or Porter 90A. Enrollment restricted to college members. E. Abrams

**93. Field Study. F,W,S**

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. The Staff

**93F. Field Study (2 credits). F,W,S**

Provides for individual program of study sponsored by the college and performed off campus. Approval of instructor required. May be repeated for credit. The Staff

**93G. Field Study (3 credits). F,W,S**

Provides for individual programs of study sponsored by the college and performed off campus. Approval of instructor required. May be repeated for credit. The Staff

**99. Tutorial. F,W,S**

Various topics to be arranged between student and instructor. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**99F. Tutorial (2 credits). F,W,S**

Various topics to be arranged between student and instructor. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**UPPER-DIVISION COURSES**

**120. Personal Empowerment. W**

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. Enrollment limited to 20. F. Andrews

**180. Research Skills for College**

**and Beyond (2 credits). W**

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. Enrollment restricted to junior and senior college members. Enrollment limited to 15. S. Amador

**192. Directed Student Teaching. F,W,S**

Teaching of a lower-division seminar by an upper-division student under faculty supervision. (See course 42.) Students submit petition to sponsoring agency, supported by faculty member willing to supervise. The Staff

**193. Field Study. F,W,S**

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. May be repeated for credit. The Staff

**193F. Field Study (2 credits). F,W,S**

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. May be repeated for credit. The Staff

**193G. Field Study (3 credits). F,W,S**

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. May be repeated for credit. The Staff

**194. Group Tutorial. F,W,S**

A program of independent study arranged between a group of students and a faculty member. The Staff

**195. Senior Research Project. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**198. Independent Field Study. F,W,S**

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. May be repeated for credit. The Staff

**199. Tutorial. F,W,S**

Various topics to be arranged between student and instructor. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# MICROBIOLOGY AND ENVIRONMENTAL TOXICOLOGY

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2015-16 General Catalog

430 Physical Sciences Building

Telephone (831) 459-4719

FAX (831) 459-3524

<http://www.metx.ucsc.edu>

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## PROGRAM DESCRIPTION

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The Microbiology and Environmental Toxicology Department (METX) sponsors undergraduate and graduate courses in microbiology and environmental toxicology, both within the department and through affiliated departments. The curriculum offers a strong foundation in fundamental and applied toxicology and microbiology to provide 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.

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### UNDERGRADUATE PROGRAMS

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While the METX Department only awards graduate degrees, it does offer a select number of undergraduate courses to prepare and attract promising undergraduates for advanced studies in microbiology and environmental toxicology or related disciplines. Students interested in microbiology and environmental toxicology 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 toxicology. With department approval, these undergraduates may also take graduate courses in microbiology and environmental toxicology. That coursework will be applied toward a graduate degree in microbiology and environmental toxicology if they are accepted into the program.

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### GRADUATE PROGRAMS

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Graduate training in the METX Department prepares students to solve important problems in the field of environmental health by providing stimulating coursework, extensive scientific presentation training, and in-depth research that culminates in a thesis. There is no other program in the world that educates students to appreciate the interplay between microbes, chemical toxins, and health and provides the training students require to work effectively in a complex world.

Graduate training in the METX department prepares students to become leaders in the field, following career paths in academia, teaching, industry, and government. Master of science (M.S.) students typically finish in two years and doctor of philosophy (Ph.D.) students in four to six years.

Key components of our graduate training include:

- Interdisciplinary core course that teaches critical thinking and how to approach problems: METX 200, Interdisciplinary Approaches to Problems at the Interface of Microbiology and Environmental Toxicology.
- Core course devoted to grant-writing skills: METX 205, Scientific Skills, Ethics, and Writing.
- Personalized class plan for the remaining three courses to fit the student's background and research goals. Possible courses include METX 201, Sources and Fates of Pollutants, METX 202, Cell and Molecular Toxicology, METX 206A, Advanced Microbiology, METX 210, Molecular and Cellular Basis of Bacterial Pathogenesis, METX 238, Pathogenesis: Molecular Mechanisms of Disease, and METX 250, Environmental Microbiology, as well as courses in other departments such as Ocean Sciences 220, Chemical Oceanography, and Molecular Cell and Developmental Biology 200B, Advanced Molecular Genetics. Speaking presentation skills training through coursework and yearly departmental presentations. Scientific

## Microbiology and Environmental Toxicology

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 to form connections and collaborations.

- Qualifying examinations designed to perfect the student's ability to craft research plans.
- Extensive laboratory research training that starts immediately upon entering the program and culminates in the student's master's thesis or Ph.D. dissertation.

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### SAMPLE PATHWAYS

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Pathways within the microbiology and environmental toxicology graduate program focus on interdisciplinary approaches to addressing problems in environmental and public health. We offer several defined training pathways, and also encourage students to create their own.

#### METALS IN THE ENVIRONMENT

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Research includes how organisms are exposed to metals, how these metals cause toxicity, and investigating the concentration, speciation, and isotopic composition of contaminant metals and metalloids.

#### MICROBIOLOGY

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Microbiology provides research training on molecular genetic analysis of both non-pathogenic and pathogenic microbes. Students study host-pathogen interactions, ecology and evolution of pathogenic microorganisms, adaptation of pathogenic and non-pathogenic microorganisms to environmental stresses, and mechanisms of microbial biotransformation of pollutants and toxic metals.

#### CELLULAR AND ORGANISMAL TOXICOLOGY

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This pathway provides training in the biochemical, molecular, cellular, and physiological processes that are impacted by exposures to such contaminants as toxic metals. Research includes exposure pathways and toxicity of contaminants and pathogens within humans, with emphasis on the molecular and cellular mechanisms underlying toxicity.

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### PROGRAM REQUIREMENTS

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The METX student's curriculum is tailored to the individual, creating a graduate experience that combines essential background material with coursework at the frontiers of science. The student, in conjunction with a faculty committee, chooses classes to complement the Ph.D. or master's thesis work that each student is performing. Students are encouraged to

explore new areas and bring this expertise back to their thesis research.

#### REQUIREMENTS FOR BOTH MASTER'S AND PH.D. STUDENTS IN MICROBIOLOGY AND ENVIRONMENTAL TOXICOLOGY

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1. Core coursework. METX 200 Interdisciplinary Approaches to Problems at the Interface of Microbiology and Environmental Toxicology, and METX 205, Scientific Skills, Ethics, and Writing, must be taken and passed with at least a B.
2. Three additional courses. Two courses from the following: METX 201, 202, 206A, 210, 238, 250, and at least one additional approved graduate-level course within Microbiology and Environmental Toxicology or another department. Students must enroll in METX 281, 292, and 297 or 299 each quarter. Additional courses as recommended by your first-year advising committee. Must be passed with at least a B.
3. Literature review. Under direction of the student's adviser, 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 adviser at the end of the summer of the first year.
4. Department seminar. Give a 20-minute departmental seminar each academic year, and one 50-minute departmental seminar during the fall quarter of the third year if a doctoral student, or in spring of the second year if a master's student.

#### REQUIREMENTS SPECIFIC TO THE PH.D. DEGREE

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1. Teaching assistant. 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.
2. Ph.D. qualifying examination (QE1—microbiology and environmental toxicology internal). Part I of the qualifying examination consists of two portions: preparation and defense of an independent research proposal, and knowledge of material presented in the microbiology and environmental toxicology core courses taken by the student. The student must complete QE1 no later than spring quarter of the second year.
3. Third-year seminar and thesis proposal. The student will present a 50-minute seminar on his/her dissertation research proposal no later than the end of fall quarter in the third year.
4. Ph.D. qualifying examination (QE2). Present and defend a dissertation research proposal to the

## Microbiology and Environmental Toxicology

student's Ph.D. qualifying examination (QE) committee. The student must complete QE2 no later than fall quarter of the third year.

5. 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 parts I and II.
6. Dissertation 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.

## REQUIREMENTS SPECIFIC TO THE MASTER'S DEGREE

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1. 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.
2. Second-year seminar. The student will present a 50-minute seminar on his/her thesis work in spring quarter of the second year.
3. 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.

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## MICROBIOLOGY AND ENVIRONMENTAL TOXICOLOGY FACULTY AND PROFESSIONAL INTERESTS

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### **Victoria Auerbuch Stone, Associate Professor**

Interactions between the pathogen *YERSINIA PSEUDOTUBERCULOSIS* and the innate immune system

### **Manel Camps, Associate Professor**

Molecular mechanisms of reactive DNA methylation toxicity

### **A. Russell Flegal, Professor**

Anthropogenic perturbations of biogeochemical cycles, applications of isotopic tracers in anthropology and archaeology

### **Karen Ottemann, Professor**

How bacterial pathogens are able to chronically colonize mammalian hosts and cause disease outcomes such as inflammation and cancer

### **Chad Saltikov, Professor**

Microbial processes that influence the biotransformation of pollutants in the environment

### **Donald R. Smith, Professor**

Neurotoxicity, cellular and organismal responses to environmental toxins

### **Fitnat Yildiz, Professor**

Understanding processes controlling transmission of bacterial pathogens

### ADJUNCT PROFESSOR

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### **Lynn Rothschild**

Astrobiology research at NASA Ames

### **Ron Oremland**

Microbial metabolism of reduced gases and of toxic elements

### ASSOCIATE ADJUNCT PROFESSOR

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### **Myra Finkelstein**

Human impacts to wildlife with an emphasis on contaminant-induced effects



### AFFILIATED FACULTY WHO SPONSOR METX STUDENTS

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### **Roberto Bogomolni (Chemistry and Biochemistry)**

Biophysical chemistry, photobiology, light energy conversion and signal transduction in biological systems

### **Adina Paytan, Research Scientist, Institute of Marine Sciences**

Biogeochemistry, paleoceanography, environmental and aquatic chemistry

### **Jonathan Zehr (Ocean Sciences)**

Aquatic microbial ecology, biological oceanography

### ADDITIONAL AFFILIATED FACULTY

### ENVIRONMENTAL TOXICOLOGY

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### **Don Croll (Ecology and Evolutionary Biology)**

Foraging ecology of marine sea birds and mammals, island conservation/ecology

### **Andrew Fisher (Earth and Planetary Sciences)**

Hydrology, crustal studies, heat flow modeling

**Raphael Kudela (Ocean Sciences)**

Ecological modeling and remote sensing, satellite oceanography, phytoplankton ecology and harmful algal blooms

**Matthew McCarthy (Ocean Sciences)**

Marine organic geochemistry and chemical oceanography, global biogeochemical cycles, compound-specific isotopes and radio carbon

**Peter T. Raimondi (Ecology and Evolutionary Biology)**

Applied marine ecology

CELLULAR TOXICOLOGY

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**Lindsay Hinck (Molecular, Cell, and Developmental Biology)**

Breast development and cancer, cell biology, and development

**Theodore Holman (Chemistry and Biochemistry)**

Bioinorganics and biological chemistry

**Pradip K. Mascharak (Chemistry and Biochemistry)**

Bioinorganic chemistry, design of antitumor drugs, modeling of active sites of metalloenzymes, design of catalysts for hydrocarbon oxidation, studies on intermediates in non-heme oxygenase chemistry, design of NO-donors for photodynamic therapy

**Glenn Millhauser (Chemistry and Biochemistry)**

Electron paramagnetic resonance; nuclear magnetic resonance, protein structure and function, peptide synthesis, prions, melanocortin signaling

**Martha Zuniga (Molecular, Cell, and Developmental Biology)**

Negative selection of autoreactive T cells in the thymus and in peripheral lymphoid organs, immunological tolerance to epithelial antigens, MHC transfer between keratinocytes and dendritic cells

MICROBIOLOGY

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**Grant Hartzog (Molecular, Cell, and Developmental Biology)**

Biochemistry, genetics, chromatin and transcriptional regulation

**Douglas R. Kellogg (Molecular, Cell, and Developmental Biology)**

Control of cell growth and size

**Roger Linington (Chemistry and Biochemistry)**

Marine natural products, marine microbiology, drugs for neglected diseases, chemical biology, chemical probes

**Todd Lowe (Biomolecular Engineering)**

Experimental and computational genomics, ncRNA gene finders, and high-throughput RNA sequencing to study the biology of extremophile archaea and bacteria

**Nader Pourmand (Biomolecular Engineering) Director, UCSC Genomics Sequencing Center**

Development of new tools and technologies that integrate biology, electronics, and nanofabrication for the detection and study of genes and proteins

**Joshua Stuart (Biomolecular Engineering)**

Computational genomics

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MICROBIOLOGY AND ENVIRONMENTAL TOXICOLOGY COURSES

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LOWER-DIVISION COURSES

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**80E. Aquatic Toxicology. F**

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. (General Education Code(s): SI, T-2 Natural Sciences.) A. Flegal

UPPER-DIVISION COURSES

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**101. Sources and Fates of Pollutants. S**

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 course 201. A. Flegal

**102. Cell and Molecular Toxicology. \***

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.

## Microbiology and Environmental Toxicology

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 course 202. (Formerly Cellular and Organismal Toxicology.) Prerequisite(s): Biology 20A and 20B or equivalent; Biology 100, Biochemistry, and 110, Cell Biology, are recommended. Enrollment restricted to juniors and seniors. D. Smith

### **119. Microbiology. F,S**

Cell and molecular biology of bacteria and their viruses, including applications in medicine, public health, agriculture, and biotechnology. Prerequisite(s): BIOL 100 or BIOC 100A. V. Stone, F. Yildiz

### **119L. Microbiology Laboratory. F,W,S**

An introduction to the principles and practices of laboratory microbiology, with a substantial presentation of optical microscopy. Students are billed a materials fee. Prerequisite(s): previous or concurrent enrollment in course 119 required; satisfaction of Entry Level Writing and Composition requirements. Enrollment restricted to biological sciences and affiliated majors; biology minors; other majors by permission. (General Education Code(s): W.) C. Saltikov, K. Ottemann

### **125. Practicing Safe Science (2 credits). W**

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. The Staff

### **135. Functional Anatomy. S**

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. (Formerly BIOL 135.) Prerequisite(s): courses 20A and Biology: Ecology and Evolutionary 20B. Concurrent enrollment in course 135L is required. Enrollment restricted to biological sciences majors and affiliated majors and biology minors. M. Camps

### **135C. Cadaver Dissection Laboratory (2 credits). S**

Dissection of a human cadaver under the direction of an anatomy instructor. Prerequisite(s): course 135 and 135L, or Biology 135 and 135L, or Anthropology 102A. Enrollment limited to 16. May be repeated for credit. M. Camps, R. Abu-Shumays

### **135L. Functional Anatomy Lab (2 credits). S**

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. Students are billed a materials fee. (Formerly BIOL 135L.) Prerequisite(s): courses 20A and Biology: Ecology and Evolutionary 20B. Enrollment restricted to biological sciences majors and affiliated majors and biology minors. Concurrent enrollment in METX 135 is

required. Enrollment limited to 24. M. Camps

### **138. Pathogenesis: Molecular Mechanisms of Disease. \***

Overview of the pathogenic mechanisms underlying human disease at the physiological and molecular levels, with their implications for epidemiology, diagnosis, and treatment. Includes discussion of clinical cases and of emerging areas of research. Geared toward students interested in future research or clinical careers in the area of human or animal health. Students cannot receive credit for this course and Microbiology and Environmental Toxicology 238. (Also offered as Biology: Molecular Cell & Dev 118. Students cannot receive credit for both courses.) Prerequisite(s): Biology 130. Enrollment restricted to students majoring in biology; health sciences; molecular, cell, and developmental biology; biochemistry and molecular biology; or neuroscience and behavior. Offered in alternate academic years. M. Camps

### **140. Molecular Biology of Prokaryotes. \***

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 course 240. Prerequisite(s): Biology 119. K. Ottemann

**144. Groundwater Contamination. S**

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(s): Earth Science 110B. Offered in alternate academic years. A. Flegal

**145. Medical Geology. \***

An interdisciplinary analysis of natural geochemical processes that impact human health and of anthropogenic processes that exacerbate those impacts. Prerequisite(s): Chemistry 1A, 1B, 1C, 1M, and 1N. A. Flegal

**150. Introduction to Research and Experimental Design. \***

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. K. Ottemann, (FWS) The Staff

**151. Scientific Writing and Presentation. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements. (General Education Code(s): W.) The Staff

**160. Coastal Environmental Toxicology and Policy (3 credits). \***

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. Enrollment restricted to sophomores, juniors, seniors, and graduate students. M. Connor, G. Griggs, A. Flegal

**170. Drug Action and Development. \***

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 270. (Formerly Frontiers in Drug Action and Discovery.) (Also offered as Biomolecular Engineering 170. Students cannot receive credit for both courses.) Prerequisite(s): Biology 100 or Chemistry 103 or Biochemistry 100A. Biology 110 and 130/L or 131/L are recommended. Enrollment restricted to juniors and seniors. D. Smith, T. Holman, M. Camps, R. Linington, P. Berman

**195. Senior Thesis. F,W,S**

An individually supervised course, with emphasis on independent research culminating in a senior thesis. May be repeated for credit. The Staff

**195F. Senior Thesis (2 credits). F,W,S**

An individually supervised course with emphasis on independent research culminating in a senior thesis. May be repeated for credit. The Staff

**198. Independent Study. F,W,S**

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. May be repeated for credit. The Staff

**198F. Independent Study (2 credits). F,W,S**

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. May be repeated for credit. The Staff

**199. Tutorial. F,W,S**

Reading, discussion, written reports, and laboratory research on selected topics. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S**

Reading, discussion, written reports, and laboratory research on selected topics. Enrollment limited to 4. May be repeated for credit. The Staff

GRADUATE COURSES

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**200. Interdisciplinary Approaches in Environmental Toxicology. F**

Introduction to interdisciplinary, case-based approaches to problem-solving. Course demonstrates how important, current problems in

environmental and human health have been addressed and solved. Assigned problems that integrate the different organization levels (environmental, molecular/cellular, organismal/public health) inherent to environmental and human health are presented. Students work in collaborative teams to analyze each problem and create a proposal for a research plan/solution. Enrollment restricted to graduate students. C. Saltikov, D. Smith

### **201. Sources and Fates of Pollutants. S**

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 course 101. Enrollment restricted to graduate students; qualified undergraduate science majors may enroll with permission of instructor. A. Flegal

### **202. Cell and Molecular Toxicology. \***

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 Microbiology and Environmental Toxicology 102 or BIOL 122.. (Formerly "Cellular and Organismal Toxicology.") Enrollment restricted to graduate students. D. Smith

### **203. Cellular and Molecular Toxicology. \***

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. Enrollment restricted to graduate students; qualified undergraduates may enroll with instructor's permission. (FWS) The Staff

### **205. Scientific Skills, Ethics, and Writing. W**

Course provides fundamental training of graduate students in the scientific method, experimental design, ethics in science, grant proposal and scientific writing, data presentation, and scientific speaking. Students are evaluated on class participation, performance, and a written NIH/NSF style research proposal. Enrollment restricted to graduate students. D. Smith

### **206A. Advanced Microbiology. W**

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*. Enrollment restricted to graduate students. Advanced undergraduates may enroll with permission of instructor. F. Yildiz, V. Stone, M. Camps, C. Saltikov

### **210. Molecular and Cellular Basis of Bacterial Pathogenesis. S**

Focuses on the molecular basis of bacterial pathogenesis with specific emphasis on gene expression, regulation, and ecology and evolution. Enrollment restricted to graduate students. Advanced undergraduates with extensive background in microbiology and biology may enroll with permission of instructor. F. Yildiz

### **215. Seminar in Advanced Prokaryotic Molecular Biology (2 credits). \***

Seminar focuses on aspects of prokaryotic molecular biology. Specific topics include transcriptional regulation, translational regulations, DNA replication, secretion of proteins, transport of small molecules, bacterial differentiation, signal transduction, biofilm formation, and motility. Discussions focus on model bacteria such as *Escherichia coli* and *Bacillus subtilis*. Enrollment restricted to graduate

## Microbiology and Environmental Toxicology

students. F. Yildiz, C. Saltikov, K. Ottemann

### **238. Pathogenesis: Molecular Mechanisms of Disease. \***

Overview of the pathogenic mechanisms underlying human disease at the physiological and molecular levels, with their implications for epidemiology, diagnosis, and treatment. Includes discussion of clinical cases and of emerging areas of research. Geared toward students interested in research or clinical careers in the area of human or animal health. Students cannot receive credit for this course and course 138. Enrollment restricted to graduate students. M. Camps

### **240. Molecular Biology of Prokaryotes. \***

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 course 140. K. Ottemann

### **250. Environmental Microbiology. \***

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. Enrollment restricted to graduate students. Offered in alternate academic years. C. Saltikov

### **270. Drug Action and Development. \***

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.) (Also offered as Biomolecular Engineering 270. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. D. Smith, T. Holman, M. Camps, R. Linington, P. Berman

### **281A. Topics in Environmental Toxicology. \***

Selected topics in environmental toxicology. Topics vary from year to year. Enrollment restricted to graduate students; qualified upper-division science majors may enroll with instructor's permission. May be repeated for credit. The Staff

### **281C. Topics in Environmental Microbiology (2 credits). F,W,S**

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. Enrollment restricted to graduate students; qualified undergraduates may enroll with instructor's permission. C. Saltikov

### **281F. Topics in Aquatic Toxicology (2 credits). F,W,S**

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. Enrollment restricted to graduate students; qualified upper-division science majors may enroll with instructor's permission. May be repeated for credit. A. Flegal

### **281M. Topics in Molecular Toxicology (2 credits). F,W,S**

Seminar and discussion on the mechanisms of toxicity in DNA alkylating agents. Participants present results from their research, and relevant journal articles are discussed. Enrollment restricted to graduate students. Undergraduates may enroll with instructor's permission. Enrollment limited to 5. May be repeated for credit. M. Camps

### **281O. Topics in Bacterial Pathogenesis (2 credits). F,W,S**

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. (Also offered as Biology: Molecular Cell & Dev 2800. Students cannot receive credit for both courses.) Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. Enrollment limited to 20. May be repeated for credit. K. Ottemann

### **281S. Cellular and Organismal Responses to Toxicants (2 credits). F,W,S**

Intensive research seminar on the concepts, theory, and techniques in deriving physiologically based pharmacokinetic models of toxin exposure, metabolism, and efficacy

## Microbiology and Environmental Toxicology

of therapeutic treatment in mammalian models of human metal toxicity. Enrollment restricted to graduate students; qualified undergraduates may enroll with permission of instructor. May be repeated for credit. D. Smith

### **281V. Topics in Bacterial Pathogenesis and Innate Immunity (2 credits). F,W,S**

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. Enrollment restricted to graduate students. Qualified undergraduates performing research under the supervision of the instructor may enroll with instructor's permission. May be repeated for credit. V. Stone

### **281Y. Biofilms: Processes and Regulation (2 credits). F,W,S**

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. Enrollment restricted to graduate

students. Qualified undergraduate students may enroll with instructor's permission. May be repeated for credit. F. Yildiz

### **282. Current Approaches to Molecular Pathogenesis (2 credits). \***

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*. May be repeated for credit. K. Ottemann

### **290. Proseminar. \***

Special topics offered from time to time by faculty, visiting professors, or staff members. Enrollment restricted to graduate students; qualified undergraduates may enroll with instructor's permission. May be repeated for credit. The Staff

### **290A. Epidemiology and Risk Assessment. \***

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. (Formerly Biological Impact of Chemical Exposures.) The Staff

### **292. Introductory Graduate Seminar (no credit). F,W,S**

Weekly seminars by academic and research faculty on their areas of special interest. Students write weekly abstracts on articles covered by the seminars. Enrollment restricted to graduate students; qualified undergraduates may enroll with instructor's permission. The Staff

### **297. Independent Study. F,W,S**

Independent study for graduate students who have not yet settled on a research area for the thesis. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **299. Thesis Research. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# MUSIC

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2015-16 General Catalog

244 Music Center

(831) 459-2292

[music@ucsc.edu](mailto:music@ucsc.edu)

<http://music.ucsc.edu>

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## PROGRAM DESCRIPTION

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The UCSC music curriculum is distinctive in developing musicians who integrate scholarship with performance. Although this rigorous program primarily addresses Western art music, it also incorporates the study of world music cultures in both their art and vernacular traditions. A major in music establishes a substantial foundation for further academic or performance studies. Two undergraduate majors are offered: the bachelor of music (B.M.), which especially develops the student's attainment in performance, and the bachelor of arts (B.A.), which cultivates greater breadth in the student's academic achievement. Two minors in music are also offered: one in electronic music, and one in jazz. The electronic music and jazz minors are open to music majors, as well as to students pursuing other majors.

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 master of arts (M.A.) degree in music has emphases in composition, musicology/ethnomusicology, or performance practice, and integrates studies in performance, composition/analysis, and research. 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. The doctor of musical arts (D.M.A.) degree in music composition has tracks in computer-assisted composition and world music composition and 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.

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.

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## UNDERGRADUATE PROGRAMS

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The bachelor of arts (B.A.) degree integrates performance, theory, composition, history, and literature. The bachelor of music (B.M.) degree is designed for exceptionally talented students who intend to pursue a career in performance. Acceptance to the B.M. program is by audition during fall quarter; students must audition prior to their senior year.

The core degree requirements are the same for both bachelor of arts (B.A.) and bachelor of music (B.M.) students and are as follows:

- Music 30A, 30B, and 30C, Theory, Literature, and Musicianship
- Music 60, Group Instruction in Piano, taken concurrently with the Music 30 sequence (may be waived if the student is taking piano lessons from a UCSC instructor)
- Music 130, Harmony and Form in 19th-Century and Early 20th-Century Music
- Music 101A, 101B, and 101C, History of Western Art Music
- One course from the Music 105 series, Special Topics in History
- One course from the Music 150 series, Special Topics in Theory
- One course from the Music 180 series, Studies in World Musics

Additional Course Requirements for the Bachelor of Arts (B.A.)

- One of the following: Music 121, Orchestration; Music 124, Intermediate Electronic Sound Synthesis; or an additional Music 150 series or Music 180 series course
- Senior Capstone: Music 120, Seminar in Music Composition; or an additional Music 105 series course by permission of instructor

## Music

- A minimum of six quarters of Music Department instrumental or choral ensembles
- A minimum of six quarters of applied instruction (private individual instrumental or vocal lessons)

### Additional Course Requirements for the Bachelor of Music (B.M.)

- A minimum of 12 quarters of Music Department instrumental or choral ensembles
- A minimum of 11 quarters of applied instruction (private individual instrumental or vocal lessons)
- Demonstration of an advanced level at Continuing B.M. juries each fall and spring quarter
- Music 196B, Senior Recital

The B.M. degree is for students who aspire to academic excellence and an advanced performance level. 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.

**Note:** B.M. students wishing to concentrate in jazz are required to take Music 111B, Seminar in Jazz Analysis, instead of one of the Music 180 courses and Music 174, Intermediate Jazz Improvisation; and Music 175, Jazz Theory II.

It is essential that students in either program begin the Music 30 sequence, ensembles, and applied instruction in fall of their freshman year or as early as possible to

make satisfactory progress toward their degree objectives.

Sample academic plans for the B.A. and B.M. degree programs are found in the Music Student Handbook, available online at the Music Department web site: <http://music.ucsc.edu>.

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## UNDERGRADUATE PROGRAM LEARNING OUTCOMES

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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).
  - 30ABC, Theory, Literature, and Musicianship
  - 60, Fundamental Keyboard Skills
  - 130, Harmony and Form in 19th- and Early 20th-century Music
  - 150, Special Topics in Music Theory
  - Foreign Language Requirement (for B.M. students concentrating in voice)
3. Developing skills of critical thinking and writing about music by taking courses on past and present musical cultures in European and other heritages.
  - 101ABC, History of Western Art Music
  - 105, Special Topics in Music History
  - 180A or B or C or D, Studies in World Music
  - Upper-division electives
4. Creating music by performing, composing, and improvising.
  - 120, Seminar in Music Composition
  - 121, Orchestration; or 124, Intermediate Electronic Sound Synthesis
  - Performance ensembles (6 quarters for B.A. students, 12 quarters for B.M. students)
  - Individual Lessons (6 quarters for B.A. students, 11 quarters for B.M. students)
  - 196B, Senior Recital (required for B.M. students; an elective for B.A. students who qualify by petition)

## Music

- Upper-division electives in historical and cultural studies, music and technology, theory, conducting, and jazz improvisation

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### HOW MUSIC MAJORS ARE ASSESSED

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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 Music 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 Music 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.

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### QUALIFICATION POLICY

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- Successful completion of Music 30A with a grade of "C" or above;
- Signature approval by the applied instrument instructor on the primary instrument authorization form.

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### FOREIGN LANGUAGE REQUIREMENT

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French 1, German 1, and Italian 1 are required for B.M. students who wish to concentrate in voice. 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 up to a comparable level 3 at UCSC or be able to pass the level 4 entrance examination.

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### LETTER GRADE REQUIREMENT

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All upper-division courses applied toward the music majors must be taken for a letter grade, except ensemble courses, which may be taken Pass/No Pass.

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### REQUIRED EXAMINATIONS AND AUDITIONS

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**Core Curriculum Placement Examination.** This examination is for the placement of students, including transfer students and re-entry students, into the appropriate music lower-division core course. It includes written sections in the areas of theory and musicianship that emphasize aural recognition and identification of musical structures and brief definitions of terms relating to music history. The date of the examination is normally the Tuesday before the first day of instruction for fall quarter. For more information on the examination including a sample test, please visit our web site: <http://music.ucsc.edu>.

**Advisory Audition.** All students in Music 30A, including music minors, will be scheduled for a juried audition at the end of the first fall quarter (on their major instrument or voice). The purpose of this audition is 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. The advisory audition is waived for students who have been admitted to the B.M. program.

**Proficiency Audition.** It is a requirement of the major that all students in Music 130 must audition at the end of the second fall quarter and exhibit an upper-intermediate or higher level (on their major instrument or voice). The audition committee may allow for an extension (up to two quarters maximum) for a student who fails the proficiency audition.

**Bachelor of Music Auditions.** Auditions for admissions to the B.M. program are held at the end of each fall quarter. Students must have approval from applied music instructor in order to audition. After students have been accepted, they are required to audition twice a year, at the end of fall and spring quarters, for continuing review and critique.

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### TRANSFER STUDENTS

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The Music Department requires transfer students to take the core curriculum placement examination and seek academic counseling before transfer. Transfer students are strongly encouraged to audition in advance because auditions help determine eligibility for the major. Detailed information on auditions and a sample core curriculum placement examination is

## Music

available at:

<http://music.ucsc.edu/programs/important-information-incoming-and-prospective-students>.

Transfer students who have some background in music theory normally test into Music 30A (which is only offered in the fall quarter). Students who require Music 15 for music theory preparation should take Music 15 in their first year or during summer session prior to their incoming fall quarter to prepare for Music 30A. Transfer students who have completed all of their general education requirements and who test into Music 30A upon transfer may be able to complete the music major in two years.

B.A. transfer students should note that upon completion of Music 130, it is a requirement of the major to perform on a musical instrument or voice at an upper-intermediate level. Prospective students wishing to have their performance skill level assessed by faculty in preparation for entry to the program are encouraged to send a CD or tape for faculty review.

B.M. transfer students should prepare to audition in the fall quarter after enrollment. (For audition requirements, see the Requirements for the Bachelor of Music section above.) In certain cases, some or all of the applied music requirement may be waived based on prior coursework.

Because Italian 1, German 1, and French 1 are required for voice students, transfer students are encouraged to complete these language requirements before coming to UCSC.

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### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in music is satisfied by completing Music 101A and 101C (already a part of the core curriculum and required for the B.A. and B.M.).

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### HONORS

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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.

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### APPLIED MUSIC (INDIVIDUAL INSTRUCTION)

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Private lessons in various instruments are required as a part of the B.A., B.M. or minor in music. These lessons carry an additional fee and require an audition with the instructor. Concurrent enrollment in an appropriate ensemble is required for a stipulated number of quarters. Consult the Music Student Handbook for more details.

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### MINORS

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#### ELECTRONIC MUSIC

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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. A student may obtain a minor in electronic music by application and acceptance to the minor program and completing the following:

- One course from the following: Music 11A, Classical Music from the Middle Ages to the Present; Music 11B, Introduction to Jazz; Music 11C, Introduction to American Popular Music; or Music 11D, Introduction to World Music
- Music 15, Preparatory Musicianship
- Music 80C, History, Literature, and Technology of Electronic Music
- Music 123, Electronic Sound Synthesis
- Music 124, Intermediate Electronic Sound Synthesis
- Music 125, Advanced Electronic Sound Synthesis
- Two quarters of Music 167, Workshop in Electronic Music
- One of the following: Music 80L, 80M, or 80R (or a similar music course that has a technical focus as approved by the department), or Film 171A or Theater Arts 114
- One of the following: Physics 160; or Computer Science 5C, 5J, 5P, or 12A; or Electrical Engineering 70, 153, or 171

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#### JAZZ

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The jazz minor focuses on the study of the history, theory, and performance of jazz. In addition, students may be introduced to musical styles that have had profound influences on this uniquely American art form: folk and popular musics of Africa, Europe, and the United States and Western classical music. The jazz

## Music

minor is limited to students who have sufficient performance proficiency to pass auditions for entry into the jazz ensembles. The required courses for the minor in jazz are the following:

- Music 11A, Classical Music from the Middle Ages to the Present
- Music 15, Preparatory Musicianship
- Music 75, Beginning Improvisational Theory and 175, Jazz Theory II
- Music 111B, Seminar in Jazz Analysis
- One of the following: Music 11C, 11D, 80J, or 80Q;
- Six quarters of ensembles, including at least three quarters of the jazz ensembles (Music 3, Large Jazz Ensemble and/or 164, Jazz Ensemble)
- Music 174, Intermediate Jazz Improvisation

Detailed information about the music majors and minors may be obtained from the Music Department web site and undergraduate adviser.

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### GRADUATE PROGRAMS

#### MASTER OF ARTS

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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 adviser, 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.

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#### REQUIREMENTS

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A minimum of 60 course credits completed at UCSC is required for the degree. All M.A. students are required to complete:

- Music 200, Introduction to Research Methods
- Music 201, History of Music Theory from the Greeks through Rameau
- Music 202, Tonal and Post-tonal Analysis
- Music 252, Current Issues Colloquium during each quarter in residence (for students entering the program fall 2007 and thereafter).

Students with an emphasis in composition also complete:

- Music 219, Techniques in Composition
- Music 220, Graduate Seminar in Music Composition
- One course in the Music 203 Performance Practice series.

Students with an emphasis in musicology/ethnomusicology or performance practice also complete:

- Three courses from the Music 203 Performance Practice series (Music 206D, Music Perception and Cognition meets the requirement for one 203 course). It is possible in some cases to substitute a course from the Music 253 or 254 series for one 203 course.

The final project for the degree includes both performing and scholarly components, which vary according to the degree emphasis.

Students with a composition emphasis submit a thesis composition together with an essay that addresses historical, technical, and/or interpretive issues of the music (Music 299); and they complete a full-length recital (Music 298) of their compositional work.

Students with a musicology/ethnomusicology emphasis complete a thesis (Music 299) and a short performance or lecture-recital related to the thesis (Music 298).

Students with a performance practice emphasis complete a full-length recital (Music 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 (Music 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.

Graduate students must take all courses for a letter grade with the exception of independent study courses (Music 261, 265, 295, 297, 298, and 299) and the colloquium course (Music 252), which may be taken with the Satisfactory/Unsatisfactory grade option.

Prior to the start of classes each fall quarter, each incoming M.A. student is required to complete a three-hour diagnostic examination which is intended to identify areas in which supplementary coursework may be needed, in addition to the courses listed above.

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#### DOCTOR OF MUSICAL ARTS

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The doctor of musical arts (D.M.A.) degree program in music composition has tracks in computer-assisted composition and world music composition. The track in computer-assisted composition includes algorithmic techniques for the generation of musical materials and structures to be realized in the creation of instrumental,

## Music

vocal, and digitally synthesized music. The track in 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.

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### REQUIREMENTS

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For students entering with the bachelor's degree, a minimum of 102 credits in coursework at UCSC 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 UCSC 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).

Required courses include:

- Music 200, Introduction to Research Methods
- Music 201, History of Music Theory from the Greeks through Rameau
- Music 202, Tonal and Post-tonal Analysis
- Music 219, Techniques in Composition
- Music 220, Graduate Seminar in Music Composition
- Music 252, Current Issues Colloquium (each quarter in residence)
- Five quarters of independent study—Music 297, 298, and 299.

**Note:** Students entering with a master's degree from another institution may petition to waive one or more of these courses by submitting documentation for equivalent courses completed elsewhere.

Students in the computer-assisted composition track complete:

- Music 206B, Computer-Assisted Composition
- One course in the Music 203 Performance Practice series
- Two quarters of Music 267, Workshop in Computer Music and Visualization, or another Music 206 course.

Students in the world music composition track complete:

- Music 206A, World Music Composition
- Music 203H, Area Studies in Performance Practice
- Music 203G, Concepts, Issues, and the Practice of Ethnomusicology; or another Music 206 course.

Graduate students must take all courses for a letter grade with the exception of independent study courses (Music 261, 265, 295, 297, 298, and 299) and the colloquium course (Music 252), which may be taken with the Pass/No Pass grade option.

Prior to the start of classes in fall quarter, each incoming D.M.A. student is required to complete a three-hour diagnostic examination which is intended to identify areas in which supplementary coursework may be needed, in addition to the courses listed above.

A D.M.A. student who entered the D.M.A. program with a bachelor's degree may apply for an M.A. degree, whether he/she is leaving the D.M.A. program or continuing toward completion of the D.M.A. degree, by fulfilling the following requirements:

- Completion of a minimum of five quarters at UCSC.
- Completion of a minimum of 35 graduate or upper-division course credits (including all courses required for the M.A. degree with an emphasis in composition).
- Successful completion of the qualifying recital (Music 298).

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### PRE-QUALIFYING REVIEWS

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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 Music 200, 201, and/or 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 Porter College and the Music Department, and 2) participation in a

public reading of graduate-student final projects from Music 219 and 220.

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### THE QUALIFYING RECITAL

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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.

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### DISSERTATION PROSPECTUS

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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 those areas of study that should be emphasized in the student's qualifying examination.

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### QUALIFYING EXAMINATION

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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.

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### DISSERTATION

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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.

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## FINAL EXAMINATION

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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.

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### DOCTOR OF PHILOSOPHY IN MUSIC

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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.

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### REQUIREMENTS

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Students entering the Ph.D. program with a bachelor's degree are required to complete the following courses:

- Music 200, Introduction to Research Methods
- Music 201, History of Music Theory from the Greeks through Rameau
- Music 202, Tonal and Post-tonal Analysis
- Three courses from the Music 203 Performance Practice series (Music 206D, Music Perception and Cognition, or a Music 254 course may each substitute for one 203 course)
- Three courses from the Music 253 series
- Three courses from the Music 254 series
- Music 252, Current Issues Colloquium (during each quarter of residence)
- Music 299, Thesis Research

Students entering the Ph.D. program with a master's degree are required to complete following courses:

- Three courses from the Music 253 series
- Three courses from the Music 254 series
- Music 252, Current Issues Colloquium (during each quarter of residence)
- Music 299, Thesis Research

## Music

All students in the Ph.D. program, whether or not they are entering the program with a master's degree, should plan to take at least two, and preferably three of the following courses in addition to the regular requirements: Music 201, Music 202, Music 203H, or Anthropology 208A. The decision about which of these courses to take should be made in consultation with the student's adviser and the chair of the graduate committee.

Graduate students must take all courses for a letter grade with the exception of independent study courses (Music 261, 265, 295, 297, 298, and 299) and the colloquium course (Music 252), which may be taken with the Satisfactory/Unsatisfactory grade option.

Prior to the start of classes in fall quarter, each incoming Ph.D. student is required to complete a three-hour diagnostic examination that is intended to identify areas in which supplementary course work may be needed.

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 may devise a program of study that includes additional music courses, and courses from other disciplines suited to their special areas of concentration, in addition to the required courses.

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: Music 200, 201, 202, one course from the Music 203 series, Music 252 each quarter in residence, one course each from the Music 253 and 254 seminar series, and Music 297.

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### PRE-QUALIFYING REVIEWS

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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.

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### QUALIFYING EXAMINATIONS

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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.

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### DISSERTATION

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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.

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### FINAL EXAMINATION

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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 web site: <http://music.ucsc.edu/>.

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## FOREIGN LANGUAGE REQUIREMENT (FOR ALL GRADUATE PROGRAMS)

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For M.A. and D.M.A. students, 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.

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## MUSIC FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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#### **Amy C. Beal**

American music, 20th-century music, experimental and improvisatory performance practices, biography, women composers, piano performance, contemporary music ensembles (including percussion ensemble and gamelan), postwar and Cold War culture, German new music festivals and radio stations, trans-Atlantic cultural exchange

#### **Linda C. Burman-Hall, Emerita**

#### **David H. Cope, Emeritus**

#### **Sherwood Dudley, Emeritus**

#### **Karlton E. Hester**

Premeditated, electroacoustic, and spontaneous composition; flutes, saxophones, and interdisciplinary performance; improvisational and Afrocentric music theory, analysis and history. Artistic Director, Global African Music and Arts Festival/Symposium; UCSC/ISIM International Improvisation Festival/Conference.

#### **Edward F. Houghton, Emeritus**

#### **David Evan Jones**

Instrumental and computer-assisted composition, electro-acoustic music, world music composition, chamber opera, language and music, timbre and orchestration

#### **Hi Kyung Kim**

Composition, theory, contemporary music, analysis, orchestration, Korean music, world music composition, Founder and Artistic Director, Pacific Rim Music Festival

#### **Anatole Leikin**

Classical and romantic music history, theory, and performance practices, piano and fortepiano, Russian music

#### **Leta E. Miller**

Twentieth-century American music in the United States, 16th-century chanson and madrigal, music and science in the baroque period; C.P.E. Bach, Lou Harrison, music in San Francisco, modern and baroque flute

#### **Gordon Mumma, Emeritus**

#### **Paul Nauert, Emeritus**

#### **Nicole A. Paiement, Emerita**

#### **Larry Polansky**

Composition, post-tonal theory, algorithmic music, American music, tuning theory, contemporary music, ensemble performance and performance practice, acoustic and electric guitar music, music editing and publishing, interdisciplinary collaboration, music and scientific research

#### **John M. Schechter, Emeritus**

Music

ASSOCIATE PROFESSOR

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**Benjamin L. Carson**

Composition, music perception, empirical musicology, Arnold Schoenberg, popular culture, improvisation

**Tanya H. Merchant**

Ethnomusicology, musics of Central Asia, the former Soviet Union, and the Balkans, music and gender, identity, nationalism, globalization, and the institutionalization of music

**Dard Neuman, Kamil and Talat Hasan Endowed Chair in Classical Indian Music**

Ethnomusicology; Hindustani music; colonialism, nationalism, technology and performance; sitar

**Nina Treadwell**

Renaissance through early baroque music history and performance practices, early plucked-string instruments (theorbo, renaissance, and baroque guitar; renaissance lute), 16th- and 17th-century Italian theatrical music, gender studies, women and music, literary and critical theory

ASSISTANT PROFESSOR

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**David Dunn**

Sound art and design, music and the environment, acoustic ecology, compositional linguistics, live electro-acoustic performance, composition, bio-acoustic research, history of electronic music practice, art and science, audio engineering and location recording

**Nicol C. Hammond**

South African music, popular music studies, ethnomusicology, voice, nationalism, postcolonialism, gender and sexuality, queer studies, world music, music of sub-Saharan Africa, music of the Global South

**Bruce Kiesling**

Conducting

ADJUNCT PROFESSOR

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**Zachary Watkins**

Electronic music, composition, improvisation

LECTURER

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**Nathaniel A. Berman**

Director, Concert Choir and Wind Ensemble

**Kyle Bruckmann**

Oboe

**Paul Contos**

Saxophone

**William D. Coulter**

Classical guitar

**Greer Ellison**

Flute, baroque and classical flutes

**Maria V. Ezerova**

Piano

**Giacomo Fiore**

Musicology

**Roman Fukshanksky**

Clarinet

**Barry L. Green**

String bass

**Thomas Horning**

Trombone, euphonium and tuba

**Erin Irvine**

Bassoon

**Roy T. Malan**

Violin, viola

**George E. Marsh**

Drumset, improvisation, rhythm theory, Inner Drumming, game theory, polyrhythms, Deep Listening

**Stan E. Poplin**

String bass, jazz ensembles

**Richard Roper**

Trumpet

**Ittai Rosenbaum**

Music theory, jazz ensembles

**Vanessa Ruotolo**

Cello

**Emily Sinclair**

Voice

**Brian J. Staufenbiel**

UCSC Opera Program Director

**Undang Sumarna**

West Javanese gamelan

**Avi Tchamni**

Theory, ethnomusicology

**Susan C. Vollmer**

Horn

**Zachary Watkins**

Electronic music studio

**Sheila Willey Hannon**

Voice

**William K. Winant**

Orchestral percussion, percussion ensemble



VISITING PROFESSOR

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**Aashish Khan**

North Indian classical music

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## MUSIC COURSES

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### LOWER-DIVISION COURSES

#### **1A. Women's Chorale (2 credits). \***

Study of vocal and choral techniques in the context of ensemble rehearsals, often culminating in public performance. Repertoire to include varied works for treble choir, both a cappella and with instrumental accompaniment. Familiarity with basic music notation recommended. Some additional rehearsal time, both individually and with the group is required. Students are billed a materials fee. Admission by audition with conductor prior to first class meeting. May be repeated for credit. (General Education Code(s): A.) The Staff

#### **1C. University Concert Choir (2 credits). F,W,S**

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. Students are billed a materials fee. May be repeated for credit. (General Education Code(s): PR-E, A.) The Staff

#### **2. University Orchestra (2 credits). F,W,S**

A study of selected works for orchestra, culminating in one or more public concerts. Admission by audition with conductor prior to first class meeting. Students are billed a materials fee. May be repeated for credit. (General Education Code(s): PR-E, A.) The Staff

#### **3. Large Jazz Ensemble (2 credits). F,W,S**

Instruction in performance in large jazz ensembles with written arrangements. Prepares a specific repertoire for public performance. Admission by audition with instructor prior to first class meeting. Students are billed a materials fee. Enrollment limited to 25. May be repeated for credit. (General Education Code(s): A.) The Staff

#### **4A. Latin American Ensemble: "Voces" (2 credits). \***

Instruction in diverse musical traditions, and their culturally-grounded performance contexts, of Native American, Ibero-American, and African American music cultures of Latin America, including texted music in Spanish and Quechua or other regional languages. The class forms an ensemble that prepares varying cultural and national repertoires for public performance. Some Spanish language ability is recommended. Attend first class meeting. Enrollment limited to 25. May be repeated for credit. (General Education Code(s): A.) The Staff

#### **4B. Latin American Ensemble: "Taki Ñan" (2 credits). \***

Development of Latin American, Native American, Ibero-American, African American, and/or Nueva Canción (New Song) repertoire in a small ensemble setting. Three quarters of course 4A or previous enrollment in course 4B required prior to enrolling in this course. Admission by audition with instructor at first class meeting. Enrollment limited to 10. May be repeated for credit. (General Education Code(s): A.) The Staff

#### **5A. West Javanese Gamelan Ensemble: Beginning (2 credits). F,W,S**

Instruction in practice and performance of gamelan music from Java or Sunda. Preparation of several works for public presentation. Attend first class meeting. May be repeated for credit. (General Education Code(s): A.) U. Sumarna

#### **5B. West Javanese Gamelan Ensemble: Intermediate (2 credits). F,W,S**

Instruction in practice and performance of gamelan music from Java or Sunda. Preparation of several works for public presentation. Attend first class meeting. May be repeated for credit. (General Education Code(s): A.) U. Sumarna

#### **5C. West Javanese Gamelan Ensemble: Advanced (2 credits). F,W,S**

Instruction in practice and performance of gamelan music from Java or Sunda. Preparation of several works for public presentation. Attend first class meeting. May be repeated for credit. (General Education Code(s): A.) U. Sumarna

#### **6. Classical Guitar Ensemble (2 credits). \***

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

## Music

audition with instructor prior to first class meeting. May be repeated for credit. (General Education Code(s): A.) The Staff

### **7. Music, Mind, Evolution, Language. S**

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. May be repeated for credit. (General Education Code(s): IM.) L. Polansky

### **8. Balinese Gamelan Ensemble (2 credits). F,W,S**

Instruction in practice and performance of gamelan music from Bali and Indonesia, including ritual and new music. Preparation of several works for public presentation. Attend first class meeting. Prerequisite(s): course 5A or 5B or 5C, or by permission of instructor at first class meeting. May be repeated for credit. (General Education Code(s): A.) The Staff

### **9. Wind Ensemble (2 credits). F,W,S**

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. Students are billed a materials fee. May be repeated for credit. (General Education Code(s): PR-C, A.) The Staff

### **10. Eurasian Ensemble (2 credits). W,S**

Performing ensemble focusing on the vernacular and art musics of the Eurasian continent, with emphasis on Central Asia. Admission by instructor determination at first class meeting. Enrollment limited to 25. May be repeated for credit. (General Education Code(s): PR-C, A.) T. Merchant

### **11A. Classical Music from the Middle Ages to the Present. \***

A study of significant works of classical music from Gregorian chant to the present day in relation to the historical periods which they represent. Emphasis upon the listening experience and awareness of musical style and structure. Illustrated lectures and directed listening. (General Education Code(s): IM, IH, A.) A. Leikin, N. Treadwell, L. Miller

### **11B. Introduction to Jazz. \***

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. (General Education Code(s): IH, A, E.) K. Hester

### **11C. Introduction to American Popular Music. \***

Survey of American popular music, from the beginnings of mass media to the late-twentieth century and beyond. Areas of focus will include early African-American styles (the blues, gospel and ragtime), vaudeville songs, a variety of immigrant traditions and folk movements, rock and roll, soul, R & B, hip-hop, and others. Musical experience helpful but not required. (General Education Code(s): IH, A.) B. Carson

### **11D. Introduction to World Music. \***

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. (General Education Code(s): CC, IH, A, E.) T. Merchant

### **15. Preparatory Musicianship. S**

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. May be repeated for credit. The Staff

### **30A. Theory, Literature, and Musicianship. F**

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. Enrollment limited to 60. A. Leikin

### **30B. Theory, Literature, and Musicianship. W**

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

## Music

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): course 30A; instructor determination at first class meeting. Enrollment limited to 60. A. Leikin

### **30C. Theory, Literature, and Musicianship. S**

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): course 30B; instructor determination at first class meeting. Enrollment limited to 60. A. Leikin

### **42. Student-Directed Seminar. \***

Seminars taught by upper-division students under faculty supervision. (See course 192.) Students submit petition to sponsoring agency. The Staff

### **51. Vocal Repertoire Class (2 credits). F,W,S**

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. Enrollment limited to 20. May be repeated for credit. (General Education Code(s): A.) E. Sinclair, S. Willey

### **54. North Indian Music Workshop (2 credits). S**

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. May be repeated for credit. (General Education Code(s): A.) A. Khan

### **60. Fundamental Keyboard Skills (2 credits). \***

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 course 30A. Concurrent enrollment in course 30A is required. Students are billed a course fee. Prerequisite(s): Instructor determination at first class meeting. (Formerly Group Instruction in Piano.) Enrollment limited to 8. May be repeated for credit. E. Arulanantham

### **61. Individual Lessons: Half Hour (2 credits). F,W,S**

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. May be repeated for credit. The Staff

### **62. Individual Lessons: One Hour (3 credits). F,W,S**

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. May be repeated for credit. The Staff

### **63. Group Instrumental and Vocal Lessons (2 credits). \***

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. Enrollment limited to 6. May be repeated for credit. The Staff

### **75. Beginning Improvisational Theory. \***

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. Enrollment limited to 30. May be repeated for credit. (General Education Code(s): A.) The Staff

### **80A. Music of the Silk Road. \***

Exploration of the commonalities between music cultures found along ancient trade routes through Asia. (General Education Code(s): CC, T4-Humanities and Arts, A, E.) T. Merchant

## Music

### **80C. History, Literature, and Technology of Electronic Music.**

\*  
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. (General Education Code(s): PE-T, T6-Natural Sciences or Humanities and Art, A.) The Staff

### **80E. Race and American Music.**

\*  
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. (General Education Code(s): ER.) B. Carson

### **80F. Music in Latin American Culture: Regional Traditions.**

\*  
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. (General Education Code(s): T4-Humanities and Arts, A, E.) The Staff

### **80G. American Musical Theater.**

\*  
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. Offered in alternate academic years. (General Education Code(s): IM, T4-Humanities and Arts, A.) The Staff

### **80H. The Hollywood Musical.**

\*  
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. (General Education Code(s): T4-Humanities and Arts, A.) The Staff

### **80I. Music of Modern Israel.**

\*  
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. Enrollment limited to 40. (General Education Code(s): CC, T4-Humanities and Arts, A, E.) A. Tchamni

### **80J. American Folk Music.**

\*  
Surveys American folk music, both instrumental and vocal, by region and period. Approach is primarily through listening. Previous musical experience helpful, but not required. Offered in alternate academic years. (General Education Code(s): T4-Humanities and Arts, A.) The Staff

### **80K. Sound in Art, Science, and the Environment. S**

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. (General Education Code(s): PE-E.) D. Dunn

### **80L. Artificial Intelligence and Music.**

\*  
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. Offered in alternate academic years. (General Education Code(s): MF, T-6 Natural Sciences or Humanities and Arts, A.) The Staff

### **80M. Film Music.**

\*  
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. Offered in alternate academic years. (General Education Code(s): IM, T4-Humanities and Arts, A.) N. Treadwell, The Staff

### **80N. Music of the Grateful Dead.**

\*  
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. Offered in alternate

## Music

academic years. (General Education Code(s): IM, T4-Humanities and Arts, A.) The Staff

### **80O. Music, Politics, and Protest. \***

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. (General Education Code(s): IM, T4-Humanities and Arts, A.) D. Neuman

### **80P. History of Jewish Music. \***

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. Enrollment limited to 40. (General Education Code(s): CC, T4-Humanities and Arts, A, E.) A. Tchamni

### **80Q. A Survey of African Music. \***

Traces the various stylistic musical areas throughout the African continent and explores the development of traditional African music from antiquity into the 20th century. Offered in alternate academic years. (General Education Code(s): CC, T4-Humanities and Arts, A, E.) K. Hester

### **80R. Music and the World Wide Web. \***

A survey of musical applications of the World Wide Web and the technologies they employ: tools for musical research, playback, composition, performance, and publishing. Historical perspectives and artistic ethics also discussed. Students prepare a creative project using software tools, techniques, sound sources available on the web,

and learn how to publish the results on the web. Enrollment limited to 44. Offered in alternate academic years. (General Education Code(s): T6-Natural Sciences or Humanities and Arts, A.) The Staff

### **80S. Women in Music. F**

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. (Also offered as Feminist Studies 80S. Students cannot receive credit for both courses.) Offered in alternate academic years. (General Education Code(s): CC, T4-Humanities and Arts, A.) T. Merchant

### **80T. Mizrach: Jewish Music in the Lands of Islam. \***

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. (General Education Code(s): CC, T4-Humanities and Arts.) A. Tchamni

### **80V. The Music of the Beatles. \***

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 course 180V in the same quarter. Course 11C is recommended but not required as preparation. (General Education Code(s): IM, T4-Humanities and Arts, A.) The Staff

### **80W. Music Business. \***

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 course 180W in the same quarter. Offered in alternate academic years. (General Education Code(s): T4-Humanities and Arts, A.) The Staff

### **80X. Music of India. \***

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. (General Education Code(s): CC, T4-Humanities and Arts, A, E.) D. Neuman

### **80Y. Music, Anti-Semitism, and the Holocaust. \***

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. Enrollment limited to 85. (General Education Code(s): IM.) A. Tchamni

### **80Z. Laptop Music. F**

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,

## Music

and rhythm, and sonic realization via MIDI (musical instruction 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. Enrollment limited to 30. (General Education Code(s): PR-C.) D. Jones

### **94. Group Tutorial. F,W,S**

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. The Staff

### **99. Tutorial. F,W,S**

A program of directed study arranged with a department faculty member. Students submit petition to sponsoring agency. The Staff

### **99F. Tutorial (2 credits). F,W,S**

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. The Staff

## UPPER-DIVISION COURSES

### **101A. History of Western Art Music. W**

First quarter of a three-quarter chronological study of Western art music. Coordinated lectures, readings, listening, and analysis of representative works: Medieval, Renaissance, Baroque. Prerequisite(s): course 30A and satisfaction of the Entry Level Writing and Composition requirements. N. Treadwell, L. Miller

### **101B. History of Western Art Music. S**

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(s): course 30B. A. Leikin

### **101C. History of Western Art Music. F**

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(s): course 30C and satisfaction of the Entry Level Writing and Composition requirements. A. Beal

### **102. University Orchestra (2 credits). F,W,S**

A study of selected works for orchestra, culminating in one or more public concerts. Admission by audition with conductor prior to first class meeting. Students are billed a materials fee. Enrollment restricted to juniors and seniors. May be repeated for credit. (General Education Code(s): A.) Y. Samet, N. Paiement

### **103. University Concert Choir (2 credits). F,W,S**

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. Students are billed a materials fee. May be repeated for credit. (General Education Code(s): A.) N. Berman

### **105. Special Topics in History. The Staff**

### **105A. Music of the United States. \***

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(s): course 101A, 101B, or 101C, or by permission of the instructor. Enrollment restricted to juniors and seniors. Enrollment limited to 35. A. Beal, L. Miller

### **105E. Early Keyboard Music. \***

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(s): course 101A or 101B or 101C. Enrollment restricted to junior and senior music majors. The Staff

### **105I. Improvisation and Collaborative Practices in the 20th Century. \***

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(s): courses 30A, 30B, and 30C, and at least one course from the 101 series. Enrollment restricted to music majors. Enrollment limited to 40. A. Beal, K. Hester

### **105M. Solo Song: from Monophony to Monody. S**

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(s): course 30A and 101A. Enrollment is restricted to music majors. Enrollment limited to 30. N. Treadwell

## Music

### **105O. Opera from Peri to Pergolesi. W**

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(s): courses 30C and 101A, or by permission of the instructor. N. Treadwell

### **105Q. The String Quartet from Haydn to Shostakovich. \***

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.

Prerequisite(s): course 30C and course 101B, or by permission of instructor. Enrollment limited to 35. L. Miller

### **111B. Seminar in Jazz Analysis. F**

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 course 11B. Prerequisite(s): course 30B and course 11B. Enrollment limited to 20. K. Hester

### **120. Seminar in Music Composition. W**

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(s): course 30C. Enrollment limited to 20. D. Jones, L. Polansky, H. Kim

### **121. Orchestration. F**

A study of the nature of each instrument of the orchestra. Scoring

for various small instrumental combinations, culminating in a transcription for full orchestra. (Formerly course 130.)

Prerequisite(s): course 30C.

Enrollment limited to 20. H. Kim

### **123. Electronic Sound Synthesis. W**

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; course 80C or course 30A placement. Enrollment limited to 25. The Staff

### **124. Intermediate Electronic Sound Synthesis. S**

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(s): course 123.

Enrollment limited to 25. The Staff

### **125. Advanced Electronic Sound Synthesis. F**

Continuing study in the electronic music studio, with concentration on compositional development.

Includes advanced applications of skills developed in courses 123 and 124, expansion of background knowledge and relevant electroacoustical studies.

Prerequisite(s): course 124.

Enrollment limited to 25. The Staff

### **127. Sound, Listening, and Consciousness. S**

This course is a hands-on practicum. Students explore the cutting edge of sound and consciousness from multiple perspectives, realizing inherent skills as listeners and music-makers through direct engagement--through attention to sound.

Enrollment limited to 20. (General Education Code(s): PR-C.) J. Hoefs

### **130. Harmony and Form in 19th-Century and Early 20th-Century Music. F**

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(s): course 30C and Piano Proficiency Exam. Enrollment limited to 20. (General Education Code(s): MF.) D. Jones, B. Carson

### **150. Special Topics in Theory. The Staff**

#### **150C. Special Topics in Music Theory: Tonal Counterpoint. S**

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(s): course 130.

(General Education Code(s): IM.) D. Jones, B. Carson

#### **150I. Special Topics in Music Theory: Hindustani Music. \***

In-depth introduction into the music, culture, and theory of

## Music

Hindustani music. Prerequisite(s): course 130. Enrollment restricted to junior and senior music majors. (General Education Code(s): CC.) D. Neuman

### **150P. Special Topics in Music Theory: 20th-Century Popular Song. \***

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(s): course 30C or permission of instructor. Enrollment restricted to music majors. (General Education Code(s): IM.) B. Carson

### **150S. Focus on Spontaneous Composition. S**

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(s): course 130. Enrollment restricted to sophomores, juniors, and seniors. Enrollment limited to 35. K. Hester

### **150T. Post Tonal Composition and Analysis. S**

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(s): course 130. Enrollment limited to 20. (General Education Code(s): IM.) D. Jones

### **150X. Theoretical Practices of American Music. \***

Examines theoretical practices and compositional methods of 20th-Century American composers including Charles Ives, Henry Cowell, Ruth Crawford, Johanna Beyer, Harry Patch, Conlon Nancarrow, John Cage, James Tenney, Kenneth Gaburo, George Russell, and Ornette Coleman. Prerequisite(s): courses 30A, 30B, and 30C. Enrollment restricted to music majors. Enrollment limited to 25. (General Education Code(s): IM.) D. Jones, L. Polansky, A. Beal

### **159A. Opera Workshop (2 credits). F,W**

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. Students are billed a materials fee. Enrollment limited to 30. May be repeated for credit. (General Education Code(s): A.) B. Staufenbiel

### **160. University Opera Theater. S**

A production workshop, culminating in one or more staged performances of an entire opera or selected scenes from the operatic repertory. Admission by audition with instructor prior to first class meeting; auditions usually take place in fall quarter. Students are billed a materials fee. May be repeated for credit. (General Education Code(s): A.) B. Staufenbiel

### **161. Individual Lessons: One Hour (3 credits). F,W,S**

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. May be repeated for credit. The Staff

### **162. Advanced Individual Lessons: One Hour. F,W,S**

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. May be repeated for credit. The Staff

## Music

### **163. Early Music Consort (2 credits). \***

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. May be repeated for credit. (General Education Code(s): PR-C.) N. Treadwell

### **164. Jazz Ensembles (2 credits). F,W,S**

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. May be repeated for credit. S. Poplin

### **165. Chamber Music Workshop (2 credits). F,W,S**

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. May be repeated for credit. The Staff

### **166. Chamber Singers (2 credits). F,S**

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. Students are billed a materials fee. May be repeated for credit. (General Education Code(s): PR-C, A.) The Staff

### **167. Workshop in Electronic Music (2 credits). F,W,S**

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(s): course 124. Enrollment limited to 20. May be repeated for credit. The Staff

### **168. Contemporary Music Ensemble (2 credits). \***

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 prior to first class meeting. May be repeated for credit. A. Beal, L. Miller

### **174. Intermediate Jazz Improvisation. \***

Develops basic skills through a range of advanced bop, quasi-modal and post-bebop styles—including selected free jazz and "avant-garde" repertoire. Prerequisite(s): course 75; audition with instructor at first class meeting. Enrollment limited to 20. May be repeated for credit. K. Hester

### **175. Jazz Theory II. W**

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(s): course 75. Enrollment limited to 30. K. Hester

### **180A. Studies in World Musics: Asia and the Pacific. \***

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(s): course 30B. Concurrent enrollment in a non-Western performing ensemble is strongly recommended. Enrollment restricted to music majors and graduate students. Anthropology majors may enroll with permission of instructor. Enrollment limited to 30. (General Education Code(s): A, E.) T. Merchant, D. Neuman

### **180B. Studies in World Musics: Africa and the Americas. \***

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(s): course 30B; concurrent enrollment in a non-Western performing ensemble is strongly recommended. Enrollment restricted to music majors and graduate students. Anthropology majors may enroll with permission of instructor. Enrollment limited to 30. (General Education Code(s): A, E.) The Staff

### **180C. Studies in World Musics: Central Asia. \***

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,

## Music

and Tuva. Prerequisite(s): course 30A. Enrollment restricted to music majors. Enrollment limited to 36. T. Merchant

### **180D. Music of Insular Southeast Asia. S**

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(s): course 30A; concurrent enrollment in course 5B, 5C, or 8. Enrollment restricted to music majors. Anthropology majors may enroll with permission of instructor. (General Education Code(s): CC.) The Staff

### **192. Directed Student Teaching. F,W,S**

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. The Staff

### **195A. Senior Thesis. F,W,S**

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. The Staff

### **195B. Senior Thesis. F,W,S**

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. The Staff

### **196A. Senior Recital Preparation (without individual lessons). F,W,S**

Prerequisite(s): juried audition or approved composition portfolio. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **196B. Senior Recital Preparation (with individual lessons). F,W,S**

Students are billed a course fee. Prerequisite(s): juried audition. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

A program of directed study arranged with a department faculty member. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

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. May be repeated for credit. The Staff

## GRADUATE COURSES

### **200. Introduction to Research Methods. F**

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. N. Treadwell, L. Miller

### **201. History of Music Theory from the Greeks Through Rameau. W**

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. (Formerly Pretonal and Tonal Analysis.) Enrollment restricted to graduate students. Offered in alternate academic years. L. Miller

### **202. Tonal and Posttonal Analysis. W**

Encompasses various forms of linear analysis, set theory, and selected topics in current analytical practice. Offered in alternate academic years. P. Nauert, H. Kim, D. Jones

### **203. Special Topics in Performance Practice. \***

Investigation of primary and secondary sources of information about the culturally and historically accurate performance of music in various times and places. Undergraduates who have completed the appropriate course 101 courses may enroll in 203 courses by interview with the instructor. The Staff

### **203A. Performance Practice in the Middle Ages. \***

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. L. Miller

### **203B. Performance Practice in the Renaissance. \***

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

## Music

performance of a Renaissance work. Offered on a rotational basis with other courses in the 203 series. N. Treadwell, L. Miller

### **203C. Performance Practice in the Baroque. \***

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. The Staff

### **203D. Performance Practice in the Classic Period. \***

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. The Staff

### **203E. Performance Practice in the Romantic Period. W**

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. A. Leikin

### **203F. Performance Practice in the 20th Century. \***

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. May be repeated for credit. B. Carson, A. Beal, D. Jones

### **203G. Concepts, Issues, and the Practice of Ethnomusicology. \***

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. The Staff

### **203H. Area Studies in Performance Practice. \***

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. May be repeated for credit. D. Neuman, H. Kim

### **205. Conceptual Foundations in Music Repertoire and Analysis. F,W,S**

A series of 2-credit courses that build upon and advance the depth and breath of analytical skills with the aim of preparing graduate students for advanced work in cultural musicology. The Staff

### **205A. Conceptual Foundations in Western Music Analysis (2 credits). F**

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. Enrollment is restricted to graduate students. A. Leikin, N. Treadwell, A. Beal, L. Miller

### **205B. Conceptual Foundations in World Music (2 credits). W**

A broad survey of traditional and vernacular musical practices from around the world with an emphasis on aural analysis and critical listening skills. Enrollment is restricted to graduate students. Enrollment limited to 15. D. Neuman, N. Hammond, T. Merchant

### **206A. World Music Composition. W**

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

## Music

compositional/improvisational approach. Enrollment restricted to graduate students. Enrollment limited to 12. May be repeated for credit. K. Hester

### **206B. Computer-Assisted Composition. W**

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. (Also offered as Digital Arts and New Media 217. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. L. Polansky

### **206D. Music Perception and Cognition. \***

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. Enrollment restricted to graduate students. Enrollment limited to 16. May be repeated for credit. B. Carson

### **219. Techniques in Composition. F**

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. (Formerly course 219A.) Enrollment restricted to graduate students. May be repeated for credit. D. Jones

### **220. Graduate Seminar in Music Composition. S**

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(s): course 219. Enrollment limited to 16. May be repeated for credit. D. Jones, L. Polansky, H. Kim

### **228. Techniques of Modernity and Aesthetic Formations. \***

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. Enrollment restricted to graduate students; upper-division undergraduates may enroll with permission of instructor. Enrollment limited to 18. D. Neuman

### **252. Current Issues Colloquium (no credit). F,W,S**

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. Enrollment restricted to graduate students. Undergraduate students may enroll with permission of instructor. L. Burman-Hall, A. Beal

### **253A. Pitch, Melody, and Tuning Systems. \***

Focuses on pitch systems from Western and non-Western cultures, and on scholarly perspectives about them throughout the 20th and 21st centuries. Enrollment restricted to graduate students. Enrollment limited to 20. T. Merchant

### **253B. Rhythm, Time, and Form. \***

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(s): course 200 or the equivalent, or consent of instructor. Enrollment restricted to graduate students. Enrollment limited to 10. B. Carson

### **253C. Music and Discourse. \***

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. Enrollment restricted to graduate students. Enrollment limited to 5. The Staff

## Music

### **253D. Issues in the Ethnography of Music. \***

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. Enrollment restricted to graduate students. Enrollment limited to 10. D. Neuman

### **254C. Performativity and Music. \***

"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. (Formerly Performance Theory and Practice.) Enrollment restricted to graduate students. Enrollment limited to 10. N. Treadwell

### **254D. Organology and Acoustics. \***

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., course 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. Enrollment limited to 15. The Staff

### **254E. Asian Resonances in 20th-Century American and European Music. \***

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. Enrollment restricted to graduate students. Enrollment limited to 10. L. Miller

### **254I. Empirical Approaches to Art Information. \***

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. (Also offered as Digital Arts and New Media 254I. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. Enrollment

limited to 17. May be repeated for credit. B. Carson

### **254J. Jazz Historiography. \***

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. Enrollment restricted to graduate students. Enrollment limited to 10. The Staff

### **254K. Music, Gender, and Sexuality. \***

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. Enrollment restricted to graduate students. Enrollment limited to 10. T. Merchant

### **254L. John Cage: Innovation, Collaboration, and Performance Technologies. \***

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. (Also offered as Digital Arts and New Media 254L. Students cannot receive credit for both courses.) Enrollment restricted to juniors, seniors, and graduate students. Upper-division undergraduates may enroll with permission of instructor. Enrollment limited to 12. A. Beal

## Music

### **254M. Music in San Francisco, 1850-1950. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. L. Miller

### **254N. Cruising the Postcolony. F**

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. Enrollment restricted to graduate students. Enrollment limited to 18. N. Hammond

### **254Q. Dialogues and Questions in Digital Arts and Culture. S**

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. (Formerly Digital Arts and New Media 203.) (Also offered as Digital Arts and New Media 202. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. The Staff

### **261. Graduate Applied Instruction (3 credits). F,W,S**

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. May be repeated for credit. The Staff

### **265. Graduate Ensemble Participation (2 credits). F,W,S**

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. May be repeated for credit. The Staff

### **267. Workshop in Computer Music and Visualization (2 credits). F,W,S**

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 by permission of instructor; appropriate graduate experience required. Enrollment restricted to graduate students. (Also offered as Digital Arts and

New Media 267. Students cannot receive credit for both courses.) Enrollment limited to 12. May be repeated for credit. L. Polansky

### **295. Directed Reading. F,W,S**

Directed reading, which does not involve a term paper. May be repeated once for credit. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **297. Independent Study. F,W,S**

Independent study, creative work, or research for graduate students who have not yet begun work on their thesis. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **298. Graduate Recital. F,W,S**

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. Enrollment restricted to graduate students. The Staff

### **299. Thesis Research. F,W,S**

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. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# OAKES COLLEGE

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2015-16 General Catalog

College Office

(831) 459-2558

<http://oakes.ucsc.edu>

For college description and list of faculty, see [Colleges](#).

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## OAKES COLLEGE COURSES

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### LOWER-DIVISION COURSES

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#### **10. Academic Success (2 credits). W**

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. The Staff

#### **30. Thesis Writing and Editing (2 credits). \***

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. Enrollment limited to 20. May be repeated for credit. The Staff

#### **42. Student-Directed Seminar.**

Seminars taught by upper-division Oakes students under faculty supervision. (See course 192.) The Staff

#### **60. Oakes Literary Journal: Further Reflections on a Diverse Society (2 credits). \***

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(s): course 80A or 80B. Enrollment restricted to first-year students. Enrollment limited to 20. May be repeated for credit. The Staff

#### **67. The Politics of Food: Labor and Social Justice (2 credits). S**

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(s): successful completion of college core course 80A, 80B, 80C, 80D, or 80H. Enrollment restricted to college members. Enrollment limited to 25. May be repeated for credit. R. King, M. Baker

#### **72. Building the Strength to Love and Dream: Oakes Oral History Project. W**

Students study the founding and development of Oakes College's first 10 years through oral history. Students immerse themselves in thorough background research and build skills necessary to conduct oral histories with founding Oakes members, revising pieces suitable for publication. Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements. Enrollment restricted to College members. L. Lopez

#### **73A. Oakes College Mentoring: Training Workshop (2 credits).**

Students discuss texts, write responses, and share ideas as they prepare to become academic peer counselors for Oakes Core students in fall. Prerequisite(s): Oakes College Core course. Enrollment restricted to Oakes College members. Enrollment by permission of instructor. L. Knisely

#### **73B. Oakes College Mentoring: Service Learning Practicum (2 credits). F**

Mentors introduce first-years to campus resources, provide them with academic support, share academic successes and difficulties, and offer guidance on college adjustment. Prerequisite(s): course 73A. Enrollment restricted to Oakes College members. (General Education Code(s): PR-S.) L. Knisely

#### **75. Oakes Student Development and Leadership Theory (2 credits). S**

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. Enrollment limited to 30. May be repeated for

**80A. Introduction to University Discourse: Communicating Diversity for a Just Society. F**

Explores rhetorical principles and conventions of university discourse providing intensive practice in analytical writing, critical reading, and speaking. Examines historical and contemporary aspects of multiculturalism in the U.S.

Explores how social inequality based on ethnicity, race, class, and gender occurs among all levels of society. Students cannot receive credit for this course and course 80B. (Formerly Introduction to University Discourse: Values and Change in a Diverse Society.) Enrollment restricted to first-year college members who have not satisfied the C1 requirement.

Enrollment limited to 22. (General Education Code(s): T5-Humanities and Arts or Social Sciences, C1, E.) R. Langhout

**80B. Rhetoric and Inquiry: Communicating Diversity for a Just Society. F**

Explores intersections of investigation, interpretation, and persuasion and hones strategies for writing and research. Examines historical and contemporary aspects of multiculturalism in the U.S. Explores how social inequality based on ethnicity, race, class, and gender occurs among all levels of society. Students cannot receive credit for this course and course 80A. (Formerly Rhetoric and Inquiry: Values and Change in a Diverse Society.) Prerequisite(s): satisfaction of the Entry Level Writing and C1 requirements.

Enrollment restricted to first-year college members. Enrollment limited to 22. (General Education Code(s): T5-Humanities and Arts or Social Sciences, C2, E.) R. Langhout

**80C. Introduction to University Discourse: Communicating Diversity for a Just Society Writing Intensive 1. F**

Explores rhetorical principles and conventions of university discourse and provides intensive practice in analytical writing, critical reading, and speaking. Examines historical and contemporary aspects of multiculturalism in the U.S.

Explores how social inequality based on ethnicity, race, class, and gender occurs among all levels of society. More writing-intensive than course 80A; prerequisite to course 80D. Enrollment restricted to first-year college members who have not satisfied the C1 requirement.

Enrollment limited to 22. The Staff

**80D. Introduction to University Discourse: Communicating Diversity for a Just Society Writing Intensive 2. W**

Continues to provide practice in analytical writing, critical reading, and speaking, and to examine issues relating to multiculturalism, diversity, and power.

Prerequisite(s): course 80C.

Enrollment restricted to first-year college members who have not satisfied the C1 requirement.

Enrollment limited to 22. (General Education Code(s): C1.) The Staff

**80F. Cultural Immersion: Exploring, Connecting, and Collaborating with Oakes and Beyond (2 credits). F**

Focuses on two issues: isolation and building a U.S.-based cultural foundation, while introducing students to university-level discourse, collaborative discussion in small groups, and peer editing of writing. Enrollment is restricted to first-year Oakes students who have been placed in the Multilingual Curriculum. The Staff

**80H. Rainbow Theater Cultural Studies. S**

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. Enrollment limited to 40. May be repeated for credit. (General Education Code(s): T4-Humanities and Arts, E.) D. Williams

**93. Field Study. F,W,S**

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. May be repeated for credit. The Staff

**94F. Group Tutorial (2 credits). F,W,S**

A program of independent study arranged between a group of students and a faculty instructor. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**95. Directed Reading. F,W,S**

Directed reading on selected topics in literature. Students submit petition to sponsoring agency. The Staff

**99. Tutorial. F,W,S**

Individual study for lower-division students directed by a fellow of Oakes. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**99F. Independent Study (2 credits). F,W,S**

Independent study on various topics to be arranged between student and instructor. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

Upper-Division Courses

**128. Latino Media in the U.S. \***

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. (Also offered as Latin American&Latino Studies 128. Students cannot receive credit for both courses.) Enrollment limited to 39. (General Education Code(s): IM, E.) The Staff

**150. Queer History and Theory in the United States. S**

Gives students a broad overview of the historical and social construction of gay and lesbian identities in the United States. The recent emergence of relatively stable LGBTQIA identities in the U.S. presents a compelling historical problem: how can we know about queer people in the past when they were often "hidden from history" or if they identified themselves in ways that may seem strange to us in the present? Students grapple with these questions as they chart the emergence and eclipsing of sexual identities in U.S. history and 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. (Formerly Gays and Lesbians in the United

States.) Enrollment restricted to junior and senior Oakes College members. Enrollment limited to 30. P. Longo

**151A. Corre la Voz: Community Literacies and Power (2 credits). F,W,S**

Required seminar for Corre la Voz program interns and Oakes students working in English-language learners (ELL) (Spanish English) community-teaching placements. Examines theories and methods that emphasize social connection, leadership, verbal enrichment, multi-modal literacies, and community empowerment. Taken concurrently with field study. Enrollment by interview only, and successful application to the Corre la Voz program or the submission of a teaching-placement agreement. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Co-requisite(s): course 151B or 199. Enrollment restricted to sophomore, junior, and senior Oakes College members. May be repeated for credit. L. Lopez

**151B. Community Literacies Field Study (3 credits). F,W,S**

Field study for Corre la Voz interns. Intensive on-site training and participation in team teaching of middle grade English-language learners (ELL) (Spanish English) youth. Literacies include mathematics, drama, social-emotional, and digital media. Enrollment by interview only, and successful application to the Corre la Voz program or previous successful quarters in the program. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Concurrent enrollment in course 151A is required during the first quarter after which course 151B may be repeated by itself.

Enrollment restricted to sophomore, junior, and senior Oakes College members. Enrollment limited to 25. May be repeated for credit. (General Education Code(s): PR-S.) The Staff

**152. Transformative Literacies. W**

Combines a seminar on critical inquiry into different theories and practices of transformative literacy work with community-service placement or a creative project. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 20. (General Education Code(s): PR-S.) L. Lopez

**153. Community Mapping. S**

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(s):satisfaction of Entry Level Writing and Composition requirements. Enrollment restricted to Oakes College members. Enrollment limited to 25. May be repeated for credit. (General Education Code(s): PR-S.) L. Lopez

**192. Directed Student Teaching. F,W,S**

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. The Staff

**193. Field Study. F,W,S**

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. The Staff

**195. Senior Thesis. F,W,S**

Senior thesis related to college-sponsored individual majors. Students submit petition to sponsoring agency. Sponsoring faculty must be member of individual major committee. May be repeated for credit. The Staff

**198. Independent Field Study. F,W,S**

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. May be repeated for credit. The Staff

**199. Tutorial. F,W,S**

Individual study for junior and senior members of Oakes College directed by a fellow of Oakes. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S**

Independent study on various topics to be arranged between student and instructor. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# OCEAN SCIENCES

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2015-16 General Catalog

A312 Earth and Marine Sciences Building

(831) 459-4730

<http://oceansci.ucsc.edu/>

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## PROGRAM DESCRIPTION

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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.

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### UNDERGRADUATE PROGRAMS

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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.) 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.

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### GRADUATE PROGRAMS

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The graduate programs in ocean sciences are designed to prepare students for careers in research, teaching, and other environmentally related endeavors. 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 to their sponsor that they have taken the classes necessary to do their research.

The prerequisites for entering the Ph.D. program are a minimum of two quarters or two semesters in each of the following: a calculus series; chemistry, and physics with labs. In addition, one course in each of the following is required: earth sciences or geological principles; biology; and statistics or biostatistics.

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## OCEAN SCIENCES PH.D. DEGREE PROGRAM

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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 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 normally taken during the third or fourth year of the program. 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.

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### SAMPLE PATHWAYS

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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.

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### BIOLOGICAL OCEANOGRAPHY

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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.

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### CHEMICAL OCEANOGRAPHY

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Chemical interactions of trace metals and radionuclides in the sea are the focus of this area of study. Research includes development of analytical techniques, measurement of trace species in seawater, and investigation of the effects and interactions of trace elements on biological processes using analytical and isotopic approaches.

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### GEOLOGICAL OCEANOGRAPHY

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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.

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### PHYSICAL OCEANOGRAPHY

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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.

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## REQUIREMENTS FOR PH.D. STUDENTS IN THE OCEAN SCIENCES DEPARTMENT

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To introduce students to the breadth and depth of the field of ocean sciences, students will be required to complete the following.

1. 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; OCEA 220,

Chemical Oceanography; OCEA 230, Biological Oceanography; and OCEA 280, Marine Geology.

2. 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. These courses are selected in consultation with the student's adviser 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).
3. OCEA 292, Ocean Sciences Seminar series. Attendance required **each quarter of enrollment**.
4. OCEA 296, Teaching in Ocean Sciences, taken prior to, or concurrent with, being a teaching assistant. Generally offered during the fall quarter each year.
5. Teaching experience is satisfied by two quarters of teaching assistant experience in Ocean Sciences or related departments. 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 a sponsor. Students beyond their first year will usually take 10 or 15 credits of Independent Study or Thesis Research each quarter.
6. Pass a departmental oral examination. 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.
7. Pass the qualifying examination to advance to candidacy. This examination requires a written research proposal to be defended orally in front of the student's Qualifying Examination Committee.
8. Ph.D. 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.

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## OCEAN SCIENCES MASTER'S DEGREE PROGRAM

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The Ocean Sciences Department offers a master of science (M.S.) degree in ocean sciences. The degree combines core courses and electives to provide depth and breadth in the ocean sciences, with a focused thesis to provide experience in original research. 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.

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. As with the doctoral program, students are encouraged to select a course of study and a research program 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.

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## COURSE REQUIREMENTS FOR THE OCEAN SCIENCES MASTER'S DEGREE

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To introduce students to the breadth and depth of the field of ocean sciences, students will be required to complete the following:

1. Complete three of the four core courses (one of which must be OCEA 200, Physical Oceanography). 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. All four core courses are recommended, however, and if taken, the fourth course counts as an elective. The courses must be taken in the following sequence: fall-OCEA 200 Physical Oceanography, and OCEA 280 Marine Geology; winter-OCEA 220 Chemical Oceanography; and spring-OCEA 230 Biological Oceanography.
2. A minimum of three graduate-level or upper-division elective courses is required to provide depth in the chosen area of emphasis. These courses are selected in consultation with the student's adviser 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).
3. A minimum of three courses in Thesis Research (OCEA 299) under the direction of a sponsor. Each quarter a student should take 15 credits of classes. Students beyond their first year will usually take 10 or 15 credits of Thesis Research each quarter.
4. OCEA 296, Teaching in Ocean Sciences, to be taken prior to or concurrent with being a teaching assistant
5. Teaching experience satisfied by one quarter as a teaching assistant for an Ocean Sciences or supporting department's courses.
6. Attendance at the Ocean Sciences Seminar series (OCEA 292) each quarter of enrollment

7. Successful completion of a master's thesis presented at an open seminar.

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 ([http://graddiv.ucsc.edu/student\\_affairs/](http://graddiv.ucsc.edu/student_affairs/)).

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## OCEAN SCIENCES FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**Margaret L. (Peggy) Delaney**

Paleoceanography, marine geochemistry

**Christopher A. Edwards**

Physical oceanography, numerical modeling of coastal physical and biological processes, data assimilation

**Robert E. Garrison (Emeritus)**

**Raphael M. Kudela**

Biological oceanography, ecological modeling, ocean optics, phytoplankton ecology and harmful algal blooms

**Matthew D. McCarthy**

Marine organic geochemistry and chemical oceanography, global biogeochemical cycles, compound-specific stable isotopes and radiocarbon

**Andrew M. Moore**

Physical oceanography; numerical ocean modeling; air-interaction; ocean prediction

**A. Christina Ravelo**

Stable isotope geochemistry and chemical oceanography, paleoclimatology

**Jonathan P. Zehr**

Aquatic microbial ecology, biological oceanography

### ASSISTANT PROFESSOR

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**Phoebe Lam**

Particle geochemistry, biological carbon pump, cycling of trace elements and isotopes, chemical oceanography

**Carl Lamborg**

Trace metal (esp. mercury) biogeochemistry, historical reconstructions of environmental chemistry using natural archives, aquatic chemistry

**Marilou Sison-Mangus**

Microbial ecology, evolutionary biology, biological oceanography

### EMERITUS FACULTY

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**Kenneth W. Bruland**

**Robert E. Garrison**

**Mary W. Silver**

### ADJUNCT PROFESSOR

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**Steven Haddock**

Ecology of bioluminescence and gelatinous zooplankton from blue-water and deep-sea environments

**Randall S. Wells**

Behavioral ecology and conservation biology of small cetaceans

### ASSOCIATE ADJUNCT PROFESSOR

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**John Carlos Garza**

Population and community ecology, plant-herbivore interactions

**Sean A. Hayes**

Behavior, ecology, genetics and population dynamics with a particular interest in salmon and pinnipeds

**Jeffrey D. Paduan**

Coastal ocean dynamics, physical oceanographic modeling from high-frequency radar data

**Alexandra Worden**

Mechanisms and controls of microbial population dynamics with an emphasis on carbon cycling in marine ecosystems

### ASSISTANT ADJUNCT PROFESSOR

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**Michael Beck**

Marine conservation, regional biodiversity planning, habitat restoration, marine proprietary rights

### LECTURER

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**Baldo Marinovic**

Plankton biology, Euphausiid (krill) population biology, zooplankton ecology, pelagic food web dynamics, climate change, potential impacts of climate change on zooplankton and fisheries

**Adina Paytan**

Biogeochemistry, paleoceanography, environmental and aquatic chemistry

**Carrie Pomeroy**

Marine policy and fisheries management

**Colleen Reichmuth**

Behavioral, sensory, and cognitive ecology of marine mammals

**Scott Shaffer**

Links between ecology, morphology, and physiological adaptations of marine vertebrates, particularly how animals use and allocate energy



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## OCEAN SCIENCES AFFILIATED AND ADJUNCT FACULTY

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**Michael Beck (The Nature Conservancy, Long Marine Laboratory)**

Marine conservation, regional biodiversity planning, habitat restoration, marine proprietary rights

**Giacomo Bernardi (Ecology and Evolutionary Biology)**

Fish biology, phylogenetics, evolution

**Mark Carr (Ecology and Evolutionary Biology)**

Marine ecology, applied marine ecology

**Daniel Costa (Ecology and Evolutionary Biology)**

Physiological ecology of marine mammals and birds

**Phillip Crews (Chemistry and Biochemistry)**

Marine natural products chemistry, bioorganic chemistry, organic structural analysis by NMR, natural products of marine macro- and microorganisms

**Donald Croll (Ecology and Evolutionary Biology)**

Ecology and conservation of islands and seabirds

**Andrew Fisher (Earth and Planetary Sciences)**

Hydrogeology, crustal studies, coupled flows, modeling

**A. Russell Flegal (Microbiology and Environmental Toxicology)**

Anthropogenic perturbations of biogeochemical cycles, applications of isotopic tracers in anthropology and archaeology

**Laurel Fox (Ecology and Evolutionary Biology)**

Terrestrial population and community ecology, plant-animal interactions

**John Carlos Garza (Southwest Fisheries Science Center)**

Population and ecological genetics of marine organisms

**Gary Griggs (Earth and Planetary Sciences, Institute of Marine Sciences)**

Coastal geology, oceanography

**Thomas Guilderson (Institute of Marine Sciences)**

Applied isotope geochemistry, biogeochemistry, carbon cycle, climate studies

**Steven Haddock (Ecology and Evolutionary Biology)**

Ecology of bioluminescence and gelatinous zooplankton from blue-water and deep-sea environments

**Sean Hayes (Southwest Fisheries Science Center)**

Behavior, ecology, genetics and population dynamics with a particular interest in salmon and pinnipeds

**Roger Linington (Chemistry and Biochemistry)**

Marine natural products, drugs for neglected diseases, chemical biology, chemical probes

**Marc Mangel (Applied Mathematics and Statistics)**

Quantitative and behavioral ecology, marine fisheries, with particular application to salmonids, rockfish and krill

**Baldo Marinovic (Institute of Marine Sciences)**

Plankton biology, Euphausiid (krill) population biology, zooplankton ecology, pelagic food web dynamics, and the potential impacts of climate change on zooplankton and fisheries interactions

**Jeffrey Paduan (NOAA/COTS Center for Integrated Marine Technology)**

Coastal ocean dynamics, physical oceanographic modeling from high frequency radar data

**Adina Paytan (Institute of Marine Sciences)**

Biogeochemistry, paleoceanography, chemical oceanography, environmental and aquatic chemistry

**Grant Pogson (Ecology and Evolutionary Biology)**

Molecular population genetics, ecological genetics, marine invertebrates and fishes

**Donald Potts (Ecology and Evolutionary Biology)**

Coral reef ecology, genetics, evolution, and geological history; marine biodiversity; tropical biology, global change, and remote sensing

**Peter Raimondi (Ecology & Evolutionary Biology)**

Marine ecology, evolutionary ecology, experimental design, applied ecology

**Colleen Reichmuth (Institute of Marine Sciences)**

Behavioral, sensory, and cognitive ecology of marine mammals

**Scott Shaffer (Biological Sciences, SJSU)**

Physiological ecology of vertebrate animals, especially birds and mammals

**Eli Silver (Earth and Planetary Sciences)**

Tectonics, remote sensing, and applied geophysics

**Lisa Sloan (Earth and Planetary Sciences)**

Earth history and global change, stratigraphy-sedimentation, methods in Paleoclimatology, topics in climate change

**Donald Smith (Microbiology and Environmental Toxicology)**

Neurotoxicity, cellular and organismal responses to environmental toxins

**Terrie Williams (Ecology and Evolutionary Biology)**

Large mammal physiology, bioenergetics, exercise and environmental physiology

**Alexandra Worden (Monterey Bay Aquarium Research Institute)**

Mechanisms and controls of microbial population dynamics with an emphasis on carbon cycling in marine ecosystems

**James Zachos (Earth and Planetary Sciences)**

Oceanography, stable isotope geochemistry, sedimentology/stratigraphy, oceans and climate, deep time paleoclimates, paleoceanography

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## OCEAN SCIENCES COURSES

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### LOWER-DIVISION COURSES

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**1. The Oceans. W,S**

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 Earth Sciences 1. (General Education Code(s): SI, IN, Q.) C. Lamborg, M. McCarthy

**80A. Life in the Sea. F,W**

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. (General Education Code(s): SI, T-2 Natural Sciences.) M. Sison-Mangus, The Staff

**80B. Our Changing Planet. F,S**

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. (General Education Code(s): PE-E, T2-Natural Sciences.) P. Lam, A. Ravelo

**90. Fundamentals of Climate. F,W**

A 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. May be repeated for credit. (General Education Code(s): SR.) A. Moore, C. Edwards

### UPPER-DIVISION COURSES

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**101. The Marine Environment. W**

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(s): Chemistry 1C and Mathematics 11B or 19B. Students taking the prerequisite math courses concurrently may enroll in the course with permission from instructor. R. Kudela

**102. Oceans and Climate: Past, Present, and Future. \***

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(s): Chemistry 1C. The Staff

**118. Marine Microbial Ecology. S**

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(s): Biology 20C or 21C, and Chemistry 1C. J. Zehr

**120. Aquatic Chemistry: Principles and Applications. S**

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(s): Chemistry 108B or 112C. C. Lamborg

**124. Aquatic Organic Geochemistry. W**

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(s): basic college chemistry (Chemistry 1B, 1C); at least one quarter of college level organic chemistry required (e.g., Chemistry 7). M. McCarthy

**130. Biological Oceanography. S**

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 may not receive credit for this course and Ocean Sciences 230.

Prerequisite(s): previous course in ocean sciences recommended. Enrollment restricted to juniors (with instructor approval), and seniors. The Staff

**172. Geophysical Fluid Dynamics. S**

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 course 272. Students cannot receive credit for this course and course 272. (Also offered as Earth Sciences 172. Students cannot receive credit for both courses.) Prerequisite(s): Physics 107; Mathematics 22 or 23B recommended. Offered in alternate academic years. C. Edwards

**199. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

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**GRADUATE COURSES**

**200. Physical Oceanography. F**

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. A. Moore

**211. Climate Dynamics. \***

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 Nino, the North Atlantic Oscillation, and the Pacific Decadal Oscillation. Enrollment restricted to graduate students. Undergraduates may enroll by permission of instructor. Previous courses in calculus and ocean sciences or earth sciences are recommended. A. Moore

**213. Biogeochemical Cycles. F**

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. (Also offered as Earth Sciences 213. Students cannot receive credit for both courses.) Enrollment 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. M. McCarthy

**215. Predicting the Atmosphere, Ocean, and Climate. \***

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. Enrollment restricted to graduate students. Undergraduates may enroll with instructor approval. Courses 200, 264, Earth Sciences 272, or equivalents are recommended. A. Moore

**218. Marine Microbial Ecology. S**

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

## Ocean Sciences

this course and course 118 and Biology 171. Biology 20C and Chemistry 1C recommended. J. Zehr

### **220. Chemical Oceanography. W**

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. P. Lam

### **224. Aquatic Organic Geochemistry. W**

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 124. M. McCarthy

### **230. Biological Oceanography. S**

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 may not receive credit for this course and course 130. Prerequisite(s): previous course in ocean sciences recommended. Enrollment

restricted to graduate students. R. Kudela

### **260. Introductory Data Analysis in the Ocean and Earth Sciences. W**

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. (Also offered as Earth Sciences 260. Students cannot receive credit for both courses.) Prerequisite(s): previous course in ocean or earth sciences is recommended. Enrollment restricted to graduate students; undergraduates with permission of instructor. C. Edwards

### **272. Geophysical Fluid Dynamics. S**

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 course 172. (Also offered as Earth Sciences 272. Students cannot receive credit for both courses.) Physics 227 is recommended as preparation. Enrollment restricted to graduate students. Offered in alternate academic years. C. Edwards

### **280. Marine Geology. F**

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 Earth Sciences 102. Enrollment restricted to graduate students. A. Ravelo

### **285. Past Climate Change. W**

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. A. Ravelo

### **286. Introduction to Ocean Modeling. \***

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. Enrollment restricted to graduate students, or to seniors by permission of instructor. A. Moore

### **290. Proseminar.**

Special topics in marine sciences to be offered from time to time by professors and staff members. The Staff

### **290A. Topics in Chemical Oceanography. S**

A weekly seminar series covering recent developments in chemical oceanography. Different topics and approaches will be stressed from year to year. May be repeated for credit. P. Lam

**290B. Topics in Biological Oceanography. \***

Explores different problems of special interest in biological oceanography. Different topics and approaches will be stressed from year to year. May be repeated for credit. M. Sison-Mangus

**290C. Topics in Marine Geochemistry. F**

Selected topics in geochemistry. Discussion of theoretical models, different approaches, and recent research. Topics vary from year to year. May be repeated for credit. C. Lamborg

**290D. Topics in Marine Microbiology. S**

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. May be repeated for credit. J. Zehr

**290E. Topics in Climatic and Oceanic Change. \***

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. May be repeated for credit. A. Ravelo

**290G. Topics in Physical Oceanography. S**

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. Enrollment restricted to graduate students; undergraduates may enroll with

permission of instructor. May be repeated for credit. A. Moore

**290H. Topics in Ocean Optics. W**

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(s): previous course in ocean sciences recommended. Enrollment restricted to graduate students; senior undergraduates with permission of instructor. May be repeated for credit. R. Kudela

**290J. Topics in Marine Organic Geochemistry. \***

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(s): previous course in ocean sciences and organic chemistry are recommended. Enrollment restricted to graduate students; upper-division undergraduates with instructor's permission. May be repeated for credit. M. McCarthy

**292. Seminar (no credit). F,W,S**

Weekly seminar on various topics attended by faculty, graduate, and upper-division undergraduate students. M. McCarthy, P. Lam, M. Sison-Mangus

**293. Graduate Research Seminar (2 credits). \***

Weekly seminar series covering a spectrum of topics in oceanography. Designed for Ph.D. program graduate students in ocean sciences and those in biology, Earth sciences, chemistry, and physics with research interests in oceanography.

Enrollment restricted to graduate students. May be repeated for credit. The Staff

**296. Teaching in Ocean Sciences (2 credits). F**

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(s): graduate standing or permission of instructor. Enrollment restricted to graduate students. C. Edwards

**297. Independent Study.**

Independent reading, research, and written reports not related to thesis research. Students submit petition to sponsoring agency. The Staff

**299. Thesis Research.**

Students submit petition to sponsoring agency. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# PHILOSOPHY

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2015-16 General Catalog

220 Cowell College

(831) 459-2070

<http://philosophy.ucsc.edu>

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## PROGRAM DESCRIPTION

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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, 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 all 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. 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.

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### PROGRAM LEARNING OBJECTIVES

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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.

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### MAJOR REQUIREMENTS

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#### COURSES

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Eleven courses are required: two at the introductory level, two in the history of philosophy sequence (100A, 100B, 100C), and seven additional upper-division courses (including one advanced seminar). For some of the lower-division required courses, students may petition to substitute courses taken at other institutions (please note that logic classes offered at community colleges will **NOT** fulfill the department’s logic requirement). These 11 courses must meet the following distribution requirements:

**Introductory.** Course 9 and at least one of courses 11, 22, or 24.

**History of philosophy.** Two of 100A, 100B, or 100C (all three strongly recommended for students who anticipate graduate work in philosophy). Taking any two from the sequence Philosophy 100A, 100B, and 100C will satisfy the Disciplinary Communication (DC) requirement.

**Upper Level.** Six courses numbered 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: 118, 137, 140, 142, 143, 144, 147, 148, 152, and 153.

Courses satisfying the metaphysics and epistemology requirement: 114, 115, 121, 122, 125, 126, 127, 133, 135, and 171.

## Philosophy

Courses 195A, 195B, and 199 also cannot be counted among these six courses. All upper-division courses must be completed at UCSC unless a petition for an exception is approved by the undergraduate program director.

**Senior Seminar.** One advanced seminar numbered 190.

Courses must be satisfied in the following sequence. Before being eligible to enroll in any course in the history sequence (Philosophy 100A-100C), a student must have completed all required introductory courses, i.e., Philosophy 9 and at least one from Philosophy 11, 22, or 24. Before being eligible to enroll in any philosophy course above Philosophy 100C, prospective majors must have taken at least one of the required history of philosophy courses (i.e., either Philosophy 100A, 100B, or 100C). Transfer students wishing to major in philosophy should consult with the Philosophy Department undergraduate adviser as soon as possible.

### DECLARING THE MAJOR OR MINOR

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Students must have taken or currently be enrolled in at least one philosophy course in order to declare the major or minor. Students declare by visiting the undergraduate adviser, who will develop an individual academic plan and complete a Petition for Major/Minor Declaration form.

### DISCIPLINARY COMMUNICATION REQUIREMENT

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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 Philosophy 100A, 100B, and 100C.

### COMPREHENSIVE REQUIREMENT

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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. In addition to Honors in an advanced seminar, graduating seniors with a distinguished record of achievement in their philosophy courses may be awarded Honors or Highest Honors in the philosophy major.

Graduation with Honors in Philosophy requires at least a 3.7 average in all philosophy courses taken at UCSC. 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.

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## MINOR REQUIREMENTS

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A minor in philosophy consists of any nine of the 11 courses required for the major. At least five of these must be upper-division. There is no senior exit requirement for the minor.

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## PROGRAM PLANNING NOTES

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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 (course 195A). Normally, the senior essay is completed in one quarter; in unusual circumstances, it can be continued for a second quarter (course 195B), but only if the writing requirements for course 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 introductory 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 in the fall quarter for students contemplating graduate school in philosophy.

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## PREPARATION FOR THE MASTER'S DEGREE

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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 the fall quarter of their senior year. For up-to-date information about the application process, consult the department's web site (<http://philosophy.ucsc.edu>); and see the Philosophy Department manager.

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## GRADUATE PROGRAM

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The department's graduate program profile emerges from its distinctive approach to the study of philosophy, including an interest in the history of philosophy as an indispensable background to the main areas of contemporary concern in the discipline. More specifically, the department's characteristic and compelling strength lies in its attitude towards the two current traditions in philosophy—the so-called analytic and continental traditions. While analytically trained, the majority of the faculty has research or teaching

## Philosophy

interests in some major 19th and 20th century European figures, including, among others, Hegel, Nietzsche, Husserl, Heidegger, and Foucault.

Among the faculty's main contemporary interests are those topics commonly pursued in any high-ranking research and teaching program, including for example research and teaching interests in philosophy of science, philosophy of biology, metaphysics, philosophy of mind, logic, epistemology, philosophy of language, philosophy of religion, moral philosophy, and aesthetics. The faculty's research and teaching in these areas is informed by leading historical figures, including especially Kant, Aristotle, Hume, Wittgenstein and—again, uniquely for such a small department—leading figures from the Middle Ages and late antiquity (including medieval Islamic figures).

Graduate students are therefore able to take advantage of a wide range of courses in the history of philosophy, including ancient, early modern, Kant, 19th-century, and the history of 20th-century philosophy (analytic, continental, and combined).

Both the master of arts (M.A.) and the doctor of philosophy (Ph.D.) programs encourage interaction with other fields.

### GRADUATE PROGRAM 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 Philosophy 294 or higher will satisfy any of these minimum core requirements. This restriction is redundant for 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 Philosophy 280 and 281 each quarter.

Philosophy 280, Graduate Colloquia Course, provides preparation for and requires attendance at all department-sponsored colloquia and works-in-progress presentations.

Philosophy 281, The Pedagogy of Philosophy, provides training in university-level teaching in general and in the pedagogy of philosophy specifically.

For further details, see the graduate program statement on the department's web page or consult with the department's graduate adviser.

#### Ph.D. Program

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.

**Courses.** 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.

**Language requirement.** 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.

**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, Philosophy 270, which must be

## Philosophy

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. Philosophy 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.

**Prospectus.** Within one year of passing the qualifying examination, i.e. 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.

**Dissertation.** The final requirement for the Ph.D. degree is a dissertation representing a contribution to philosophical research.

### M.A. Program

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Applications to the M.A. program are welcomed from talented students with 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 or two years.

**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.

**Languages.** There is no foreign language requirement for M.A. students.

**Master's paper.** By the end of the second year of study and the completion of 45 credits, M.A. students will submit a master's paper, which will normally be defended orally before a committee of two faculty members.

### Relationship of the M.A. and Ph.D. Programs

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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

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Application materials are available online at <http://graddiv.ucsc.edu>. Further information regarding the program may be requested from the Department of Philosophy at (831) 459-4578, fax: (831) 459-2650. Visit the web site at <http://philosophy.ucsc.edu>.

### DESIGNATED EMPHASIS

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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.

The following are required for the emphasis:

1. **Department approval.** The primary faculty adviser is to be consulted about the intention to pursue a Philosophy Designated Emphasis.
2. **Philosophy adviser.** A core philosophy faculty member is required to act as an adviser and serve on both the qualifying examination committee and the dissertation reading committee.
3. **Coursework.** Students must complete four graduate courses in philosophy selected in consultation with the philosophy faculty adviser. One of the four may be an independent study approved by the philosophy faculty adviser.
4. **Writing.** 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 adviser.

Guidelines and application forms are available in the Philosophy Department office.

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## PHILOSOPHY FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**W. Emmanuel Abraham, Emeritus**

**Robert A. Goff, Emeritus**

**Jorge Hankamer**

Syntax, morphology, computational linguistics, Turkish

**David C. Hoy, Distinguished Professor, Emeritus**

**S. Paul Kashap, Emeritus**

**Richard E. Otte**

Philosophy of religion, formal epistemology, philosophy of science, philosophical logic

**Paul A. Roth, Distinguished Professor**

Philosophy of social science, Quine, philosophy of history, philosophy and sociology of science, epistemology, history of analytic philosophy

**Ellen Kappy Suckiel, Emerita**

**Richard A. Wasserstrom, Emeritus**

### ASSOCIATE PROFESSOR

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**John F. Bowin**

Ancient philosophy, especially ancient science and metaphysics, and contemporary analytic metaphysics

**Jonathan Ellis**

Philosophy of mind, epistemology, philosophy of psychology, philosophy of language, Wittgenstein

**Daniel Guevara**

Kant, moral philosophy, moral psychology, environmental ethics, history of modern philosophy

**Abraham D. Stone**

Nineteenth- and early 20th-century German philosophy (continental and analytic), philosophy of science and mathematics, medieval philosophy, metaphysics, Kant

**Rasmus G. Winther**

Philosophy of science, philosophy of biology, philosophy of mind, pragmatism, Latin American philosophy, continental philosophy, philosophy of

multiculturalism, post-colonial theory, feminism, ontology, evolutionary theory, cognitive science

### ASSISTANT PROFESSOR

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**Janette Dinishak**

Philosophy and history of psychology, Wittgenstein, philosophy of mind, philosophy of science, disability studies, ethical theory

**Samantha Matherne**

Kant, 20th-century European philosophy (especially phenomenology, neo-Kantians), aesthetics

**Nicoletta Orlandi**

Philosophy of mind, philosophical psychology, epistemology, philosophy of cognitive science

### LECTURER

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**Lucas Fain**

Modern and contemporary European philosophy, social and political philosophy, history of ethics (esp. happiness), metaphilosophy, psychoanalysis of philosophy

**Jocelyn Hoy**

19th- and 20th-century continental philosophy

**Kyle Robertson**

Ethics, applied ethics, philosophy of law, logic, ancient ethics



### PROFESSOR

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**Karen M. Barad (Feminist Studies)**

Feminist science studies, materialism, deconstruction, poststructuralism, posthumanism, multi-species studies, science and justice, physics, 20th-century continental philosophy, epistemology, ontology, ethics, philosophy of physics, feminist, queer, and trans theories

**Jerome Neu, Emeritus (Humanities)**

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**PHILOSOPHY COURSES**


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**LOWER-DIVISION COURSES****8. Reason, Logic, and the Idols of Thought. F**

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. (Formerly Logic, Numbers, and Emotion: Thinking Clearly in Everyday Life.) (General Education Code(s): SR, Q.) J. Ellis

**9. Introduction to Logic. F,W**

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. (General Education Code(s): MF, IH, Q.) (F) K. Robertson, (W) J. Bowin

**11. Introduction to Philosophy. F,W,S**

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. (General Education Code(s): TA, IH.) (F) A. Stone, (W) L. Fain, (S) D. Guevara

**22. Introduction to Ethical Theory. W,S**

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. (General Education Code(s):

CC, IH.) (W) J. Dinishak, (S) N. Orlandi

**80E. Latin American Philosophy. \***

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. (Also offered as Latin American&Latino Studies 80E. Students cannot receive credit for both courses.) (General Education Code(s): T4-Humanities and Arts, E.) R. Winther

**80G. Bioethics in the 21st Century: Science, Business, and Society. F**

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. (Also offered as Biomolecular Engineering 80G. Students cannot receive credit for both courses.) (General Education Code(s): PE-T, T6-Natural Sciences or Humanities and Arts.) S. Dreisbach

**80M. Philosophical Foundations of Science Studies. \***

Provides a philosophical perspective concerning the revolution in the understanding of science that generated the so-called "science wars." Introduces the changed philosophical understanding of science shared and presupposed in the fields of science, technology, and society. (Formerly Science and Society.) (General Education Code(s): T5-Humanities and Arts or Social Sciences.) P. Roth

**80S. The Nature of Science. \***

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. (General Education Code(s): T6-Natural Sciences or Humanities and Arts.) J. Dinishak, R. Otte

**99. Tutorial. F,W,S**

The Staff

**UPPER-DIVISION COURSES****100A. Ancient Greek Philosophy. F**

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 Scepticism. (General Education Code(s): W satisfied by taking this course and either course 100B or 100C.) Prerequisite(s): course 9; courses 11 or 22 or 24; and satisfaction of the Entry Level Writing and Composition requirements. J. Bowin

## Philosophy

### **100B. The Rationalists. W**

A study of the historical background and the present relevance of Descartes, Spinoza, and Leibniz. (General Education Code(s): W satisfied by taking this course and either course 100A or 100C.) Prerequisite(s): course 9; courses 11 or 22 or 24; and satisfaction of the Entry Level Writing and Composition requirements. S. Matherne

### **100C. The Empiricists. S**

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. (General Education Code(s): W satisfied by taking this course and either course 100A or 100B.) Prerequisite(s): course 9; courses 11 or 22 or 24; and satisfaction of the Entry Level Writing and Composition requirements. A. Stone

### **106. Kant. W**

Intensive study of Kant's philosophy, particularly his epistemology and metaphysics developed in his Critique of Pure Reason. Prerequisite(s): course 9; course 11 or 22 or 24; course 100A or 100B or 100C. Enrollment limited to 70. A. Stone

### **107. Nineteenth-Century Philosophy. S**

A study of some European philosophers of the 19th century, with particular attention to Hegel, Schopenhauer, and Nietzsche. (Formerly course 108.) Prerequisite(s): course 9; course 11 or 22 or 24; course 100A or 100B or 100C. L. Fain

### **108. Phenomenology. \***

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(s): course 9; course 11 or 22 or 24; course 100A or 100B or 100C. J. Hoy

### **111. Continental Philosophy. \***

Study of recent work in continental philosophy. Topics vary. Prerequisite(s): course 9; course 11 or 22 or 24; course 100A or 100B or 100C. R. Winther

### **112. American Philosophy. \***

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(s): course 9; course 11 or 22 or 24; course 100A or 100B or 100C. R. Winther

### **113. The History of Analytic Philosophy. \***

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. (Formerly The Origins of Analytic Philosophy.) Prerequisite(s): course 9; course 11 or 22 or 24; course 100A or 100B or 100C. P. Roth

### **114. Probability and Confirmation. \***

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(s): course 9; course 11 or 22 or 24; course 100A or 100B or 100C. R. Otte

### **115. Formal Methods in Philosophy. \***

Study of formal methods commonly used in analytic philosophy. Emphasis is on developing the technical tools to enable one to read and do modern analytic philosophy. Applications of various formal tools to philosophical problems will also be discussed. Prerequisite(s): course 9; course 11 or 22 or 24; course 100A or 100B or 100C. R. Otte

### **116. Logic, Sets, and Functions. \***

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(s): course 9; course 11 or 22 or 24; course 100A or 100B or 100C. J. Bowin

### **117. Non-Classical Logic. \***

Investigations of non-classical logic. Several non-classical logics, such as various modal logics, multi-valued logics, and relevance logics studied. Meta-theoretic results investigated for each logic studied. Prerequisite(s): course 9; course 11 or 22 or 24; course 100A or 100B or 100C. R. Otte

### **118. Stoic Ethics. \***

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

## Philosophy

Epictetus). Prerequisite(s): course 100A or 100B or 100C; or consent of instructor. J. Bowin

### **119. Intermediate Logic. \***

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(s): course 9; course 11 or 22 or 24; course 100A or 100B or 100C. R. Otte

### **121. Epistemology. W**

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(s): course 9; course 11 or 22 or 24; course 100A or 100B or 100C. Enrollment limited to 98. J. Ellis

### **122. Metaphysics. F**

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.

(Formerly Contemporary Analytic Metaphysics.) Prerequisite(s): course 9; course 11 or 22 or 24; course 100A or 100B or 100C. J. Bowin

### **123. Philosophy of Language. \***

Current theories of the nature and preconditions of language, the nature of meaning, and the nature of truth. Prerequisite(s): course 9;

course 11 or 22 or 24; course 100A or 100B or 100C. The Staff

### **125. Philosophy of Science. \***

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(s): course 9; course 11 or 22 or 24; course 100A or 100B or 100C. R. Winther

### **126. Philosophy of Social Sciences. \***

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(s): course 9; course 11 or 22 or 24; course 100A or 100B or 100C. P. Roth

### **127. Philosophy of Biology. \***

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(s): course 9; course 11 or 22 or 24; course 100A or 100B or 100C. Enrollment limited to 39. (General Education Code(s): W.) R. Winther

### **133. Philosophy of Mind. \***

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(s): course 9; course 11 or 22 or 24; course 100A or 100B or 100C, or by consent of instructor. The Staff

### **135. Philosophy of Psychology. W**

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(s): course 9; course 11 or 22 or 24; course 100A or 100B or 100C, or by consent of instructor. Enrollment restricted to sophomores, juniors, and seniors. J. Dinishak

### **140. History of Ethics. \***

A careful study of any one or a number of select primary texts in the history of moral philosophy, with some emphasis on the relation to contemporary issues.

Prerequisite(s): course 9; course 11 or 22 or 24; course 100A or 100B or 100C. J. Dinishak

### **142. Advanced Ethics. \***

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(s): course

## Philosophy

9; course 22, 24, or 28, and course 100A or 100B or 100C. D. Guevara

### **143. Applied Ethics: Ethics Bowl. F**

Intensive application of ethics through debate as preparation to participate in an Ethics Bowl competition. Students develop oral advocacy skills and are given the opportunity to compete for a position on the UCSC Ethics Bowl team. Enrollment by permission of instructor. Enrollment limited to 15. May be repeated for credit. The Staff

### **147. Topics in Feminist Philosophy. \***

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. (Also offered as Feminist Studies 168. Students cannot receive credit for both courses.) Prerequisite(s): course 9; and course 11 or 22 or 24; and course 100A or 100B or 100C. J. Hoy

### **148. The Holocaust and Philosophy. \***

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(s): course 9; and course 11 or 22 or 24; and course 100A or 100B or 100C. Enrollment restricted to juniors and seniors. P. Roth

### **152. Aesthetics. S**

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(s): course 100A or 100B or 100C. (General Education Code(s): A.) S. Matherne

### **153. Philosophy of Race. \***

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(s): course 9; course 11 or 22 or 24; course 100A or 100B or 100C; or consent of instructor. R. Winther

### **155. The Trajectory of Justice in America: Eight Cases that Changed the U.S.. \***

Reviews changing concepts of justice in constitutional law cases that changed the United States politically and socially. These cases include the Pentagon Papers, the Watergate burglary, Karen Silkwood, the American Sanctuary Movement, and Iran-Contra. (Also offered as Cowell College 126. Students cannot receive credit for both courses.) The Staff

### **171. Faith and Reason. F**

Recent work in analytic philosophy of religion, concentrating on traditional theism. Topics include arguments for and against the existence of God, religious experience, miracles, the relation of faith and reason, and problems such as freedom and divine foreknowledge. Prerequisite(s): course 9; and course 11 or 22 or 24; and course 100A or 100B or 100C. R. Otte

### **180R. Readings in Philosophy (2 credits). \***

Discussion-based course centered on readings in philosophy. Readings

change each term and are a mixture of books, chapters from books, and articles. Prerequisite(s): One philosophy course. Enrollment by permission of instructor. Enrollment limited to 20. May be repeated for credit. R. Winther, R. Otte

### **190. Senior Seminar. F,S**

Special topics. Format varies each quarter. Prerequisite(s): course 9; course 11 or 22 or 24; and two from courses 100A, 100B, and 100C. Enrollment restricted to senior philosophy majors and by permission of instructor. May be repeated for credit. (F) A. Stone, (F) J. Dinishak, (S) R. Otte, (S) N. Orlandi

### **195A. Senior Essay. F,W,S**

Preparation of senior essay (approximately 25 pages) during one quarter. Students submit petition to sponsoring agency. The Staff

### **195B. Senior Essay. F,W,S**

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. The Staff

### **199. Tutorial. F,W,S**

May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

GRADUATE COURSES

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**202. Topics in Ancient Greek Philosophy. W**

Topics will vary each quarter and will focus on some major ancient Greek philosophical figure or work. Enrollment restricted to philosophy graduate students. May be repeated for credit. J. Bowin

**203. Autism. \***

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. Enrollment restricted to graduate students. J. Dinishak

**214. Probability and Confirmation. \***

Studies the philosophical foundations of probability, induction, and confirmation. Different interpretations of probability studied, and solutions to various problems and paradoxes investigated. Enrollment restricted to graduate students. R. Otte

**222. Metaphysics. \***

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. Enrollment restricted to philosophy graduate students. J. Ellis, R. Winther, A. Stone

**224. Philosophy of Language. \***

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. Enrollment restricted to philosophy graduate students. The Staff

**231. Epistemology. S**

May focus on topics such as naturalized epistemology, probabilistic epistemology, theories of justification, a priori knowledge, memory, and virtue epistemology. (Formerly Metaphysics and Epistemology.) Enrollment restricted to philosophy graduate students. May be repeated for credit. J. Ellis

**232. Advanced Topics in Value Theory. \***

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. Enrollment restricted to philosophy graduate students. Enrollment limited to 22. May be repeated for credit. D. Guevara

**233. Seminar in Philosophy of Mind. \***

A study of one or more topics in contemporary philosophy of mind. Enrollment restricted to graduate students. May be repeated for credit. J. Ellis

**235. Philosophy of Psychology. F**

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(s): One course in philosophy, psychology, or linguistics. Enrollment restricted to graduate students. N. Orlandi

**237. Making Up the Mind. \***

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. Enrollment restricted to graduate students. P. Roth

**239. Philosophy of Religion. \***

Investigation of various topics in philosophy of religion. Enrollment restricted to philosophy graduate students or by permission of instructor. May be repeated for credit. R. Otte

**252. Poststructuralism. \***

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. (Also offered as History of Consciousness 252. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. May be repeated for credit. R. Winther

**270. Research Seminar. W**

A research seminar to develop the skills of the profession with special focus on critical reading, constructing feedback, and philosophical research and writing. Must be completed by the third year. A substantial draft of a paper is required to enroll. Enrollment

## Philosophy

restricted to philosophy graduate students. May be repeated for credit. J. Ellis

### **280. Graduate Colloquia Course (2 credits). F,W,S**

This colloquia series sponsors speakers each quarter. Students must attend all colloquia and are encouraged to form discussion groups after each lecture. Enrollment restricted to philosophy graduate students. The Staff

### **281. The Pedagogy of Philosophy (2 credits). F**

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. Enrollment is restricted to graduate students. May be repeated for credit. D. Guevara

### **290A. Philosophy of History. S**

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(s): Enrollment restricted to graduate students. Enrollment limited to 10. P. Roth

### **290C. Advanced Topics in Ethics. \***

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. Enrollment restricted to philosophy graduate

students. May be repeated for credit. D. Guevara

### **290F. Topics in Philosophy of Biology. \***

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. Enrollment restricted to graduate students. May be repeated for credit. R. Winther

### **290H. Environmental Ethics. \***

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. Enrollment restricted to graduate students. D. Guevara

### **290J. Advanced Topics in the History of Ethics. \***

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. Enrollment restricted to graduate students. May be repeated for credit. D. Guevara

### **290K. Philosophical Matters of Scientific Practice. \***

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. Enrollment restricted to graduate students. K. Barad, R. Winther

### **290O. Majors Figures in the History of Philosophy. S**

Focuses on philosophical writings and significance of a single major figure in the history of philosophy, ancient, medieval, or modern. Enrollment is restricted to philosophy graduate students. Enrollment limited to 10. May be repeated for credit. S. Matherne

### **290P. Major Figures in Contemporary Philosophy. F**

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. Enrollment restricted to philosophy graduate students. May be repeated for credit. J. Dinishak

### **290Q. Philosophy of Mathematics. \***

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. Enrollment restricted to graduate students. R. Winther, A. Stone

## Philosophy

### **290S. Topics in the Philosophy of Science. \***

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. Enrollment restricted to graduate students. May be repeated for credit. R. Winther

### **290W. History of Consciousness. \***

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. Enrollment restricted to graduate students. R. Winther

### **294. Teaching-Related Independent Study. F,W,S**

Directed graduate research and writing coordinated with the teaching of undergraduates. May be repeated for credit. The Staff

**295. Directed Reading. F,W,S**  
Directed reading which does not involve a term paper. May be repeated for credit. The Staff

### **295F. Readings in Philosophy (2 credits). F,W,S**

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. May be repeated for credit. The Staff

### **296. Special Student Seminar. F,W,S**

A seminar for graduate students arranged between students and a faculty member. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **297. Independent Study. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **297F. Independent Study (2 credits). F,W,S**

Students submit petition to course sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**299. Thesis Research. F,W,S**  
Enrollment restricted to students who have advanced to candidacy. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised 09/01/15

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# PHYSICAL AND BIOLOGICAL SCIENCES DIVISION

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2015-16 General Catalog

204 Natural Sciences 2 Annex

(831) 459-2931

<http://pbsci.ucsc.edu>

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## PROGRAM DESCRIPTION

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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 Division of Physical and Biological Sciences' interdisciplinary framework 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, from evolution to plate tectonics, we provide 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 the Science Communication Program. Our undergraduate affairs office helps students understand and manage the breadth and diversity of academic programs and resources that are available to students in the physical and biological sciences. More information can be found at <http://undergrad.pbsci.ucsc.edu/>.

Revised: 09/01/15

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# PHYSICAL EDUCATION

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2015-16 General Catalog

East Field House

(831) 459-2531

<http://opers.ucsc.edu/>

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## PROGRAM DESCRIPTION

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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 this information, students will be better prepared to make important choices leading to healthy lifestyles.

Physical education courses at UCSC, 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.

Students may enroll in as many courses as they desire and are permitted to repeat any course.

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## PHYSICAL EDUCATION FACULTY AND PROFESSIONAL INTERESTS

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### DIRECTOR

**Andrea M. Willer, Ed.D**

### FACULTY

**Rena V. Cochlin**

International folk dance, Mexican dance, modern dance, ballet, yoga, pilates

### PHYSICAL EDUCATION INSTRUCTOR

**Julie Kimball**

Yoga, swimming

**Russell Kingon**

Sailing, rowing

**Joan R. McCallum**

Swimming, lifeguard training, water safety

**Cynthia Mori**

Strength training, physical conditioning, wellness, yoga

**Kim Musch**

Swimming, lifeguard training, water safety

**Lisa K. Norris**

Jazz dance, ballet

**Michael Runeare**

Soccer

**Hilary Scheer**

Sailing, Rowing

**Yoshihito Shibata**

Aikido

**Cecilia Shin**

Scuba

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## PHYSICAL EDUCATION COURSES

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### LOWER-DIVISION COURSES

**5A. Aquatics: Swimming Level I (no credit). F,W,S**

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. Students pay a course fee. Prerequisite(s): instructor determines skill level at first class meeting. Enrollment limited to 15. J. Kimball, The Staff

**5B. Aquatics: Swimming Level II (no credit). F,W,S**

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

## Physical Education

determines skill level at first class meeting; pass Swimming Level I course or demonstrate equivalent skills. Students pay a course fee. Enrollment limited to 20. The Staff, J. McCallum, J. Kimball

### **5C. Aquatics: Swimming Level III (no credit). F,W,S**

Coeducational. Stroke refinement and skill proficiency. Course teaches refinement of basic strokes and introduces butterfly, plus backstroke, surface diving, turns, endurance swimming, and survival techniques. Students pay a course fee. Prerequisite(s): instructor determines skill level at first class meeting; pass in Swimming Level II course or possess equivalent skills in freestyle, sidestroke, elementary backstroke, and breaststroke. Enrollment limited to 30. J. McCallum, The Staff

### **5D. Aquatics: Swimming Level IV (no credit). F,W,S**

Coeducational. Advanced skills. Designed to perfect the techniques and skills of all basic strokes plus butterfly, surface dives, survival swimming, basic diving, endurance swimming, and personal and rescue skills. Students pay a course fee. Prerequisite(s): pass in Swimming Level III course or possess equivalent swimming skill requirements in freestyle, backstroke, sidestroke, or competitive swimming; instructor determines skill level. Enrollment limited to 30. J. McCallum, The Staff

### **5E. Aquatics: Lifeguard Training (LT) (no credit). F,S**

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 written final

exam with 80 percent score. Students pay a course fee. 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 text book. Enrollment limited to 10. K. Musch, J. McCallum

### **5F. Water Safety Instructor (WSI) (no credit). S**

Coeducational. A Red Cross course designed to certify students who complete all required work as swimming instructors. Instruction in teaching techniques, stroke analysis, skilled swimming, class organization, pool safety, and pool maintenance. Practice teaching assignments outside of class with practical and written final exams. Screening test given at first class meeting. Prerequisite(s): must be 17 years old, possess valid ARC Instructor Candidate Training card (ICT), and ARC swimmers-level skills. (Emergency Water Safety (EWS), or Lifeguard Training (LT) certificate is highly recommended). Students pay a course fee. Enrollment limited to 10. K. Musch, J. McCallum

### **5G. Aquatics: Swimming/Conditioning (no credit). F,W,S**

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. Students pay a course fee. Prerequisite(s): instructor determination at first class meeting. Enrollment limited to 40. The Staff, K. Musch, J. McCallum

### **5H. Aquatics: Competitive Swimming (no credit). W**

Emphasis on competitive swimming and conditioning techniques. For students who want instruction at the competitive level of swimming. Three hours per week. Students pay a course fee. Prerequisite(s): instructor determination at first class meeting. Enrollment limited to 50. K. Musch

### **5R. Aquatics: Basic Scuba Diving (no credit). F,W,S**

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. Students pay a course fee. Prerequisite(s): pass swimming skills tests and medical clearance. It is strongly recommended that students enroll in course 5S. Enrollment limited to 24. C. Shin

### **5S. Aquatics: Advanced Scuba Diving (no credit). F,W,S**

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. Students pay a course fee. Prerequisite(s): course 5R or pass swimming skills test and medical clearance. (Formerly course 5T.) Enrollment limited to 25. C. Shin

### **5T. Scuba Rescue Diving (no credit). F,W,S**

Coeducational. Course geared toward the successful completion of NAUI Rescue Diver Certification. Course consists of lecture, pool laboratory, and open-water

## Physical Education

experience. Emphasis is on training divers to manage risks and effectively handle limited in-water problems. Students pay a course fee. Prerequisite(s): Scuba certification and medical clearance. Enrollment limited to 10. C. Shin

### **5U. Aquatics: Scuba Divemaster (no credit). F,W,S**

Coeducational. A diving-leadership certification course for the experienced scuba student who wishes to assist with the scuba-instruction program at UCSC. Topics include teaching techniques, skin and scuba techniques, rescue techniques, and safety procedures. Specialty laboratories also offered with this course which cover a variety of diving skills. Students pay a course fee. Prerequisite(s): Basic Scuba Certification and special prerequisite checking by instructor. (Formerly Aquatics: Scuba Instruction.) Enrollment limited to 20. C. Shin

### **9B. Boating: Beginning Dinghy Sailing (no credit). F,W,S**

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. Students pay a course fee. Prerequisite(s): swimming ability. (Formerly Boating: Basic Sailing) Enrollment limited to 18. H. Scheer, R. Kingon

### **9C. Boating: Intermediate Dinghy Sailing (no credit). F,W,S**

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. Students pay a course fee. Prerequisite(s): course 9B or equivalent skills. Enrollment limited to 16. H. Scheer, R. Kingon

### **9D. Boating: Advanced Dinghy Sailing (no credit). F,W,S**

Coeducational. For students interested in high-performance sailing using Flying Juniors and Coronado 15s. Includes special techniques used in racing conditions. Students pay a course fee. Prerequisite(s): course 9C or equivalent skills. Enrollment limited to 12. H. Scheer, R. Kingon

### **9H. Boating: Basic Rowing (no credit). F,W,S**

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. (Formerly course 9J.) Students pay a course fee. Prerequisite(s): swimming ability. Enrollment limited to 12. R. Kingon

### **9J. Boating: Intermediate Rowing (no credit). F,W,S**

Coeducational intermediate course designed to cover more advanced rowing techniques and the skills needed for safe open water rowing. Students pay a course fee. Prerequisite(s): basic rowing or permission of instructor. (Formerly course 9H.) Enrollment limited to 11. R. Kingon, The Staff

### **9K. Boating: Ocean Kayaking (no credit). F,S**

Co-educational course that teaches novice kayakers the skills to safely use UCSC kayaks in the 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. Students pay a course fee.

Enrollment limited to 12. R. Kingon, D. Johnston

### **9S. Boating: Beginning Keelboat Sailing (no credit). F,W,S**

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. Students pay a course fee. (Formerly Boating: Intermediate Keelboat Sailing.) Prerequisite(s): course 9C or equivalent skills. Enrollment limited to 16. H. Scheer, R. Kingon

### **9T. Boating: Intermediate Keelboat Sailing (no credit). F,S**

Coeducational. Further development and refinement of boat-handling techniques, including advanced maneuvering, anchoring, and racing with an introduction to the use of spinnakers. Students pay a course fee. (Formerly Boating: Advanced Keelboat Sailing.) Prerequisite(s): course 9S. Enrollment limited to 12. H. Scheer, R. Kingon

### **9X. Boating: Advanced Keelboat Sailing (no credit). F,W,S**

Coeducational. Designed for the experienced sailor who desires to bareboat larger vessels in the future. Topics include: ocean navigation; anchoring techniques; boat systems, such as diesel engines; boat plumbing and electronics; and docking. Prerequisite(s): course 9T and 40 or more hours of club keelboat usage. Enrollment by permission of instructor. Students pay a course fee. Enrollment limited to 4. H. Scheer, R. Kingon

## Physical Education

### **15B. Court Sports: Basketball (no credit). F,W,S**

Coeducational. Instruction in fundamentals, offensive and defensive strategies, rules, and conditioning designed primarily for beginning and intermediate level players. Students pay a course fee. Enrollment limited to 20. The Staff

### **15H. Court Sports: Racquetball (no credit). F,W,S**

Coeducational. The beginning section provides an introduction to the basic knowledge and skills involved in this indoor racquet sport. The advanced beginning section continues the development of the basic skills emphasizing increased shot variety and advanced strategy. The intermediate section offers the opportunity for further skill development and introduces more advanced offensive skills. Students pay a course fee. Enrollment limited to 18. The Staff, C. George, J. Bardos

### **15N. Court Sports: Tennis (no credit). F,W,S**

Coeducational. The beginning section introduces the basics of forehand, backhand, and serve. Advanced beginning section reviews these basics and introduces the volley, overhead, and lob. The intermediate section reviews all stroke mechanics and covers basic singles and doubles strategy. The advanced section includes use of spins, practice principles, detailed stroke analysis, and advanced play situations. Competitive Tennis is a year-long program for members of the intercollegiate tennis teams. Students pay a course fee. Enrollment limited to 24. The Staff

### **15T. Court Sports: Volleyball (no credit). F,W,S**

Coeducational. Beginning/intermediate, intermediate, and advanced sections are offered for students who desire to learn and improve the basic skills, as well as to understand the rules. Competitive section is open to students interested in participation in the UCSC NCAA Women's Volleyball team. It covers information and practice in all aspects of the competitive volleyball season. Students pay a course fee. Enrollment limited to 25. T. Hollenbeck, The Staff

### **20A. Dance: Ballet (no credit). F,W,S**

Coeducational. Sections offered at various technical levels graded from I to III. Emphasis on principles of movement, style, and execution of ballet technique. Section in ballet repertory where advanced students have the opportunity to perform is offered in the spring quarter. Students pay a course fee. L. Norris, The Staff

### **20B. International Folk Dance (no credit). F,W,S**

Coeducational. International folk dance with an emphasis on Balkan and Israeli dances. Sections are also offered periodically in Mexican dance. Students pay a course fee. R. Cochlin

### **20C. Dance: Jazz (no credit). F,W,S**

Coeducational. Sections offered at various technical levels graded from I to III. Exploration of jazz dance emphasizing basic technique, styling, rhythm, and isolations. Jazz and contemporary music is used as accompaniment. Some background in ballet strongly recommended before continuing to Jazz II or III. Section in jazz dance repertory

where advanced students have the opportunity to perform is offered in spring quarter. Students pay a course fee. Enrollment limited to 40. L. Norris, The Staff

### **20D. Dance: Modern (no credit). F,W,S**

Coeducational. Sections offered at various technical levels graded from I to III. Emphasis on basic techniques and building phrases of movement. Section in choreography and improvisation offered in spring quarter. Section in dance repertory offered periodically. Students pay a course fee. R. Cochlin, The Staff

### **20F. Dance: Individual Studies in Dance (no credit). F,W,S**

Coeducational. Designed to give students the opportunity of pursuing their particular interests in the field of dance with the support and direction of a faculty member. Prerequisite(s): instructor determination at first class meeting. L. Norris, R. Cochlin

### **25A. Fencing: Epee (no credit). F,W,S**

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. Students pay a course fee. The Staff

### **25B. Fencing: Foil (no credit). F,W,S**

Coeducational. Instruction in modern competitive French-Italian foil techniques for beginning, intermediate, and advanced levels. Emphasis on physical and mental conditioning leading to improved skill in recreational and competitive areas of involvement. Students pay a course fee. The Staff

## Physical Education

### **25C. Fencing: Sabre (no credit). F,W,S**

Coeducational. Instruction and practice in basic offensive and defensive skills of modern Hungarian sabre technique. Emphasis on physical and mental conditioning as a foundation for more advanced levels of instruction. Preparation for recreational and competitive involvement. Students pay a course fee. The Staff

### **28K. Field Sports: Soccer (no credit). F,W,S**

Coeducational/Women's. Sections are offered in field soccer and indoor soccer. Instruction in the basic techniques, tactics, laws of the game, and injury prevention for beginners and advanced players. Students pay a course fee. Prerequisite(s): determination at first class meeting. M. Runeare, The Staff

### **30G. Fitness Activities: Physical Conditioning (no credit). F,W,S**

Coeducational. An exercise course designed to increase the participants' strength, flexibility, coordination, and cardiovascular endurance. Special attention is given to understanding and utilizing sound and safe principles of body alignment and movement. Courses include, but not limited to: Pilates, cardio boxing, stretch and strengthen, and aerobics. Students pay a course fee. The Staff, R. Cochlin, C. Mori

### **30H. Fitness Activities: T'ai Chi Ch'uan (no credit). F,W,S**

Through balanced movement and breath control, T'ai Chi Ch'uan attempts to forestall many processes of aging by cultivating greater strength of body, mind, and spirit. Students pay a course fee. The Staff

### **30J. Fitness Activities: Strength Training (no credit). F,W,S**

Coeducational. An 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. Students pay a course fee. C. Mori, The Staff

### **30L. Fitness Activities: Yoga Exercises (no credit). F,W,S**

Coeducational. Sections offered at beginning, continuing beginning, and advanced beginning levels of Hatha Yoga. Students pay a course fee. The Staff, R. Cochlin, C. Mori, J. Kimball

### **30N. Self-Defense Basics (no credit). S**

Self-defense is a simple, effective approach to maximize personal safety requiring no prior skill, knowledge, or physical fitness. Practice includes basic physical and verbal assertiveness skills appropriate for a wide range of situations including acquaintance and stranger assaults. Physical

conditioning is an integral part of the course. (Formerly Women's Self-Defense.) The Staff

### **43A. Martial Arts: Aikido (no credit). F,W,S**

Coeducational. A 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. Sections offered at beginning and experienced levels. Students pay a course fee. Y. Shibata

### **43G. Martial Arts: Karate (no credit). F,W,S**

Coeducational. Sections offered at the beginning and intermediate/advanced levels. Covering basic skills, knowledge, and philosophy of Karate and providing instruction in the following aspects of martial arts study: fundamental techniques of self-defense, physical conditioning, emotional control, self-discipline, and self-confidence. Students pay a course fee. (Formerly Martial Arts: Tae Kwon Do.) Enrollment limited to 35. The Staff

Revised: 09/01/15

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# PHYSICS

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2015-16 General Catalog

211 Interdisciplinary Sciences Building

(831) 459-3744

<http://physics.ucsc.edu/>

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## PROGRAM DESCRIPTION

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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, even at an elementary level, this fundamental nature can be appreciated.

The Physics Department offers majors in physics, physics (astrophysics), applied physics, and physics education. These programs prepare students for graduate work in physics, astrophysics, and astronomy, for engineering and other technical positions in industry, and for careers in education. 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 are approachable to work with students in both formal and informal settings. All undergraduate physics majors have the opportunity to work individually with a faculty member in completing the senior thesis requirement.

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, 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 Stanford Linear Accelerator Center (SLAC) at Stanford University and the European centers Organization for Nuclear Research (CERN). 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 in the same building provides a healthy symbiosis in this area. Note that the Astronomy and Astrophysics Department does not offer an undergraduate major. UCSC is the headquarters for the University of California Observatories, which include 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 physics research at UCSC covers a range of topics including the behavior of exotic many-electron systems (for example, superconductors); the study of magnetic phase transitions; the organization of complex systems (proteins, DNA, and polymers); and the development of new electronic devices using novel materials and research in biophysics.

The experimental program uses X-ray and synchrotron radiation techniques at facilities such as the Stanford Synchrotron Radiation Laboratory (SSRL); neutron scattering techniques at various national laboratories; and optical, X-ray, and specific heat techniques at UCSC. Undergraduate students are actively involved in several condensed matter physics laboratories.

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## PROGRAM LEARNING OUTCOMES

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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

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### PHYSICS, ASTROPHYSICS, AND APPLIED PHYSICS MAJORS

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#### Program Learning Outcomes:

- Students will demonstrate proficiency in mathematics and the mathematical concepts needed for a proper understanding of physics.
- Students will demonstrate knowledge of classical and quantum mechanics, statistical mechanics, and electromagnetism.
- Students will show that they have learned laboratory skills, enabling them to take measurements in a physics laboratory and analyze the measurements to draw valid conclusions.
- Students will communicate effectively, both orally and in writing, and will prove that they can think critically and work independently while doing their senior thesis.
- Students will demonstrate a basic understanding of various aspects of astronomy. (Astrophysics major only.)

#### Curriculum Matrix

Courses	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5
PHYS 5ABCD		I	I		
MATH 19AB or 20AB	I				
MATH 23AB	P				
PHYS 133			P		
PHYS 134 or 135/136			D		P <sup>1</sup>
PHYS 102 <sup>2</sup>		D			
PHYS 110A		P			
PHYS 110B		D			
PHYS 112		D			
PHYS 105		D			
PHYS 116A	P				
PHYS 116BC	D				
PHYS 182 and senior thesis				D	
Upper-Division Electives					D
I = Introduced, P = Practiced, D = Demonstrated					

Physics

Assessment Plan

Year	PLO	Evidence	Population	Assessment Approach	Results Due
S <sup>3</sup> and F 2014	PLO 1	Final exam performance in PHYS 116BC	All students enrolled in both courses	Course instructors will assess student proficiency together	W 2015
W 2015- W 2016	PLO 3	Course grade in PHYS 134, 135, and 136	All students enrolled in these courses	Course grades: A exceeds expectations, B/C meet expectations, D/F below expectations	S 2016
2014- 2015	PLO 4	Senior thesis, performance in PHYS 182	All students who submit thesis and enroll in PHYS 182	Thesis supervisors and PHYS 182 instructor will assess students on a rubric to be developed	F 2015
W 2016, 2016- 17	PLO 2	Final exam performance in PHYS 102, 105, 112, and 110B	All students enrolled in these courses that are in a physics dept major	Course instructors will assess student proficiency in each of the 4 components separately, then combine	F 2017
2017- 18	PLO 5	Grades in ASTR 111-118, 171, 257	All Astro Physics majors enrolled in these courses	Course grades in undergrad courses (111-118, 171): A exceeds expectations, B/C meet expectations, D/F below expectations. Instructor evaluation in 257	Summer 2018

1. PHYS 135 and PHYS 136 are laboratory courses that specialize in techniques used in astronomy.
2. Assumes that curriculum change from 2-credit PHYS 5D and PHYS 101AB to 5-credit PHYS 5D and PHYS 102 is approved
3. F = Fall, W = Winter, S = Spring

Physics

PHYSICS EDUCATION MAJOR

Program Learning Outcomes

- Students will demonstrate proficiency in mathematics at the level needed to teach in high schools.
- Students will demonstrate proficiency in physics at the level needed to teach in high schools.
- Students will show that they have learned laboratory skills, enabling them to take measurements in a physics laboratory and analyze the measurements to draw valid conclusions.
- Students will communicate effectively, both orally and in writing.
- Students will demonstrate an understanding of the principles and practices of teaching science or mathematics in high schools.

Curriculum Matrix

Courses	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5
PHYS 5ABCD		D	I		
PHYS 102		D			
PHYS 133			P		
PHYS 134/135			D		
PHYS 182				D	
EDUC 185B/C					D
MATH 19/20AB	I				
MATH 23A	P				
MATH 23B, MATH 128A	D				

I = Introduced, P = Practiced, D = Demonstrated

Assessment Plan

Year	PLO	Evidence	Population	Assessment Approach	Results Due
F 2014- W 2016	PLO 2	Course grades in PHYS 5ABCD, 192	Physics Educ majors enrolled in these courses	A exceeds expectations, B/C meets expectations, D/F below expectations	Spring 2016
W 2015- W 2016	PLO 3	Course grades in PHYS 134, 135	Physics Educ majors enrolled in these courses	A exceeds expectations, B/C meets expectations, D/F below expectations	Spring 2016
2014- 2015	PLO 4	Performance in PHYS 182	Physics Educ majors enrolled in these courses	PHYS 182 instructor will assess students on a rubric to be developed	Spring 2015
2016- 17	PLO 1	Course grades in MATH 23B, 128A	Physics Educ majors enrolled in these courses	A exceeds expectations, B/C meets expectations, D/F below expectations	Fall 2017
W 2018	PLO 5	Performance in EDUC 185B/C	Physics Educ majors in these courses	Course grades or evaluation by instructors	Spring 2018

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## COURSES

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An undergraduate physics education is broad, yet fundamental. Undergraduate students, even in introductory classes, are exposed to new ideas associated with explorations at the boundaries of human knowledge.

The lower-division introductory courses in the major programs (Physics 5A, 5B, 5C, and 5D sequence) are well suited to students in the physical sciences and engineering. The 6A, 6B, 6C sequence, which also provides a calculus-based introduction to the basic concepts in physics, is better suited to students in the life sciences. Students who take Physics 6A instead of Physics 5A, and do very well in it, may contact the department chair for permission to enter the major. The laboratory courses, 5L-5M-5N and 6L must be taken concurrently with the corresponding lecture courses.

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## MAJOR PROGRAM

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The physics, astrophysics, and applied physics major programs provide a comprehensive coverage of the field and the background necessary for graduate school or industrial careers. The physics education major provides the necessary background to enter a rigorous credential program and, ultimately, a career in high-school science education. Students earn a bachelor of science (B.S.) degree. The UCSC physics, astrophysics, applied physics, and physics education programs begin with a four-quarter presentation of the introductory concepts of the subject, Introduction to Physics. (Note: 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 essential to start Introduction to Physics at the beginning of the first year.

This is followed by courses which provide an introduction to relativity and quantum physics. The programs continue with a three-quarter sequence in mathematical methods of physics 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 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, required of all physics, astrophysics, applied physics, and physics education majors at UCSC, 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 research with 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 physics education major is designed to provide future K-12 physics and mathematics teachers with the necessary coursework aligned with the K-12 physics and mathematics standards necessary to pass the California Subject Matter Examinations for Teachers (CSET) in Physics and Mathematics. It also includes a thorough introduction to educational theory and practice including a sequence of three classroom-based internships. Students will be well prepared to enter a rigorous teaching credential program and ultimately a career in high school education. The senior comprehensive requirement involves a curriculum development project overseen by the Physics/Astronomy faculty, with co-supervision from CalTeach/Education faculty as needed.

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## DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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Students of every major must satisfy the upper-division Disciplinary Communication (DC) requirement. Students in physics, applied physics, physics (astrophysics), and physics education satisfy the DC requirement by completing Physics 182, and the senior thesis.

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## DECLARATION OF THE MAJOR

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In order to be admitted to the physics, astrophysics, applied physics, or physics education majors students must pass Physics 5A, 5B and 5C (or, for transfer students, their approved equivalents) with letter grades, and with an average grade point average (GPA) in these three courses of 2.70 or higher. At least two of these three courses must be passed in the first attempt. (Physics 5A has corequisites of Mathematics 19A or 20A and Physics 5L; Physics 5B has prerequisites of Physics 5A and 5L and Mathematics 19A or 20A, and corequisites of Mathematics 19B or 20B and Physics 5M; Physics 5C has prerequisites of Physics 5A and 5L

## Physics

and Mathematics 19B or 20B, and corequisites of Mathematics 23A or 22 and Physics 5N.) Students who achieve a GPA of 2.66 or higher (but less than 2.70) in the three courses may declare the major if they receive a B or better in Physics 5D (or the articulated equivalent for transfer students who have already taken it elsewhere).

Students who are not eligible to declare the major may appeal this decision by submitting a letter to the Physics Department office by the later of 1) 15 days from the date the notification of this fact is mailed to them 2) one week after the start of instruction during the quarter after the final relevant grade was received (generally in 5C or 5D), or, for transfer students, their first quarter at UCSC. They also must arrange to meet with their faculty mentor. 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 notify the student, the college, and the Office of the Registrar of the decision

### LETTER GRADE POLICY

For all students entering UCSC in fall 2009 and later, all courses used to satisfy any of the physics major requirements must be taken for a letter grade.

### REQUIREMENTS OF THE MAJORS

#### PHYSICS

The requirements for the major include Physics 5A/L, 5B/M, 5C/N, and 5D; Mathematics 19A or 20A, 19B or 20B, 23A, and either 23B or Physics 14; plus the following upper-division courses: 102, 105, 110A-B, 112, 116A-B-C, 133, 134, 139A, and 182 and the senior thesis.

In addition, students must pass at least two upper-division electives chosen from physics or the following astronomy and astrophysics courses: 111 through 118. In some cases, one of the elective requirements may be satisfied by an approved upper-division science or engineering course.

Students have to satisfy a computer programming requirement by taking one of the following courses, Computer Science 5C, 5J, or 5P, Earth Sciences 119, or Physics 115. Computer Science 5C teaches programming in C/C++, 5J in Java, and 5P in Python for students with no prior experience. Astronomy 119 teaches programming in the specific context of problems from Earth sciences, physics, and astronomy. Physics 115 does not teach programming; it assumes basic programming ability in C, C++ or Fortran and

discusses numerical techniques relevant to physics. Students may also satisfy the computer programming requirement by demonstrating their knowledge of programming to a faculty member designated by the Physics Department.

#### Physics B.S.: Freshman Academic Plans

	Fall	Winter	Spring
<b>1st Year</b>	MATH 19A (or 20A) PHYS 5A/L	MATH 19B (or 20B) PHYS 5B/M	MATH 23A PHYS 5C/N Programming Requirement
<b>2nd Year</b>	MATH 23B PHYS 5D	PHYS 102 PHYS 116A	PHYS 116B
<b>3rd Year</b>	PHYS 105 PHYS 116C PHYS 133*	PHYS 110A PHYS 112 PHYS 134**	PHYS 110B PHYS 139A
<b>4th Year</b>	PHYS 182*** Elective	Elective Work on Senior Thesis	Work on Senior Thesis

\*PHYS 133 is offered in both fall and winter quarters.

\*\*PHYS 134 is offered winter and spring quarters and may be taken in the junior or senior year after completing PHYS 133.

\*\*\*PHYS 182 is offered in both fall and winter quarters.

#### Physics B.S.: Transfer Academic Plans

	Fall	Winter	Spring
<b>1st Year</b>	MATH 23B PHYS 5D	PHYS 102 PHYS 116A	PHYS 116B
<b>2nd Year</b>	PHYS 105 PHYS 116C PHYS 133*	PHYS 110A PHYS 112 PHYS 134**	PHYS 110B PHYS 139A
<b>3rd Year</b>	PHYS 182*** Elective	Elective Work on Senior Thesis	Work on Senior Thesis

#### PHYSICS (ASTROPHYSICS)

The requirements for the major include Physics 5A/L, 5B/M, 5C/N, and 5D; Mathematics 19A or 20A, 19B or 20B, 23A, and either 23B or Physics 14; plus the

## Physics

following upper-division courses: 102, 105, 110A-B, 112, 116A-B-C, 133, 135 or 136 139A and 182 and the senior thesis.

In addition, students must pass at least three upper-division electives selected from the following upper-division courses: Astronomy and Astrophysics 111 through 118, 257, 171 (cross-listed with Physics 171), or Physics 129.

Students have to satisfy a computer programming requirement by taking one of the following courses Computer Science 5C, 5J, or 5P, Earth Sciences 119, or Physics 115. Computer Science 5C teaches programming in C/C++, 5J in Java, 5P in Python for students with no prior experience. Astronomy 119 teaches programming in IDL (commonly used by astronomers) and simple applications. Physics 115 does not teach programming; it assumes basic programming ability in C, C++ or Fortran and discusses numerical techniques relevant to physics. Students may also satisfy the computer programming requirement by demonstrating their knowledge of programming to a faculty member designated by the Physics Department.

### Astrophysics B.S.: Freshman Academic Plans

	Fall	Winter	Spring
<b>1st Year</b>	MATH 19A (or 20B) PHYS 5A/L	MATH 19B (or 20B) PHYS 5B/M	MATH 23A PHYS 5C/N
<b>2nd Year</b>	MATH 23B PHYS 5D	PHYS 102 PHYS 116A ASTR 119 (programming)	PHYS 116B
<b>3rd Year</b>	PHYS 105 PHYS 116C PHYS 133*	PHYS 110A PHYS 112	PHYS 110B PHYS 139A Elective
<b>4th Year</b>	PHYS 182*** PHYS 135**	Elective Work on Senior Thesis	Elective Work on Senior Thesis

\*PHYS 133 is offered in both fall and winter quarters.  
\*\*PHYS 135 is offered in some academic years as a multiple-term course: 135A in the fall and 135B in the winter, depending on astronomical conditions. May be taken after successful completion of PHYS 133 and at least one astronomy course.  
\*\*\*PHYS 182 is offered in both fall and winter quarters.

### Astrophysics B.S.: Transfer Academic Plans

	Fall	Winter	Spring
<b>1st Year</b>	MATH 23B PHYS 5D	PHYS 102 PHYS 116A ASTR 119 (programming)	PHYS 116B Elective
<b>2nd Year</b>	PHYS 105 PHYS 116C PHYS 133*	PHYS 110A PHYS 112	PHYS 110B PHYS 139A
<b>3rd Year</b>	PHYS 182*** PHYS 135*	Elective Work on Senior Thesis	Elective Work on Senior Thesis

\*PHYS 133 is offered in both fall and winter quarters.  
\*\*PHYS 135 or PHYS 136. PHYS 135 is offered in some academic years as a multiple-term course: 135A in the fall and 135B in the winter, depending on astronomical conditions. May be taken after successful completion of PHYS 133 and at least one astronomy course. PHYS 136 is offered in spring. May be taken after successful completion of PHYS 133 and ASTR 119.  
\*\*\*PHYS 182 is offered in both fall and winter quarters.

### APPLIED PHYSICS

The requirements for the major include Physics 5A/L, 5B/M, 5C/N, and 5D; Mathematics 19A or 20A, 19B or 20B, 23A, and either 23B or Physics 14; Chemistry 1A or 1B; plus the following upper-division physics courses: 102, 105, 110A-B, 112, 116A-B-C, 133, 134, and 182 and the senior thesis.

In addition, students must pass at least three upper-division applied physics electives selected from the following approved list of courses: Physics 107, 115, 120, 129, 139A, 139B, 152, 155, 156, and 160, 171, 180, Electrical Engineering 101, 103, 115, 130, 145, 154, 171, 172, 178; other courses with approval from the department's faculty undergraduate coordinator.

Students have to satisfy a computer programming requirement by taking one of the following courses Computer Science 5C, 5J, or 5P, Astronomy 119, or Physics 115. Computer Science 5C teaches programming in C/C++, 5J in Java, 5P in Python for students with no prior experience. Astronomy 119 teaches programming in IDL (commonly used by astronomers) and simple applications. Physics 115 does not teach programming; it assumes basic programming ability in C, C++ or Fortran and discusses

## Physics

numerical techniques relevant to physics. Students may also satisfy the computer programming requirement by demonstrating their knowledge of programming to a faculty member designated by the Physics Department.

### Applied Physics B.S.: Freshman Academic Plans

#### Plan 1: For students who place into MATH 19A or MATH 20A.

	Fall	Winter	Spring
<b>1st Year</b>	MATH 19A or 20A PHYS 5A/L	MATH 19B or 20B PHYS 5B/M	MATH 23A PHYS 5C/N
<b>2nd Year</b>	MATH 23B PHYS 5D	PHYS 102 PHYS 116A	CHEM 1A (or 1B) PHYS 116B
<b>3rd Year</b>	PHYS 105 PHYS 116C PHYS 133*	PHYS 110A PHYS 112	PHYS 110B Elective PHYS 134**
<b>4th Year</b>	PHYS 182*** Elective	Work on Senior Thesis	Elective Work on Senior Thesis

\*PHYS 133 is offered in both fall and winter quarters.  
 \*\*PHYS 134 is offered in both winter and spring quarters and may be taken in the junior or senior year after completing PHYS 133.  
 \*\*\*PHYS 182 is offered in both fall and winter quarters.

### Applied Physics B.S.: Transfer Academic Plans

	Fall	Winter	Spring
<b>1st Year</b>	MATH 23B PHYS 5D	PHYS 102 PHYS 116A	PHYS 116B CHEM 1A or (1B)
<b>2nd Year</b>	PHYS 105 PHYS 116C PHYS 133*	PHYS 110A PHYS 112	PHYS 110B Elective PHYS 134**
<b>3rd Year</b>	PHYS 182*** Elective	Elective Work on Senior Thesis	Work on Senior Thesis

\*PHYS 133 is offered in both fall and winter quarters.  
 \*\*PHYS 134 is offered in both winter and spring quarters and may be taken in the junior or senior year after completing PHYS 133.  
 \*\*\*PHYS 182 is offered in both fall and winter quarters.

## PHYSICS EDUCATION

The requirements for the major include Physics 5A/L, 5B/M, 5C/N, 5D, 102, 133, 134 or 135 and 182 and the senior thesis; Mathematics 19A or 20A, 19B or 20B, 23A, 23B or Physics 14; Mathematics 100, 128A, 181; Education 50B or 50C, 100B or 100C, 185L, 185B or 185C and one upper-division course dealing with issues of diversity in education; Applied Mathematics and Statistics 5 or 7; and Astronomy 12 or 13. One elective course must be taken from physics, astronomy, mathematics or education courses, or other courses with approval of the department.

### Physics Education B.S.: Freshman Academic Plans

	Fall	Winter	Spring
<b>1st Year</b>	MATH 19A or 20A PHYS 5A/L	MATH 19B or 20B PHYS 5B/M	MATH 23A PHYS 5C/N
<b>2nd Year</b>	EDUC 50B or 50C MATH 23B PHYS 5D	MATH 100 PHYS 102	EDUC 100B or 100C AMS 5 or 7 <sup>1</sup>
<b>3rd Year</b>	ASTR 12 or 13 Science Elective	EDUC 185B/L or 185C/L PHYS 133*	MATH 128A PHYS 134**
<b>4th Year</b>	PHYS 182*** (senior thesis)	MATH 181 (senior thesis)	EDUC Diversity Elective (senior thesis)

\*PHYS 133 is offered in both fall and winter quarters.  
 \*\*PHYS 134 or PHYS 135. PHYS 134 is offered in both winter and spring. PHYS 135 is offered in some academic years as a multiple-term course: 135A in the fall and 135B in winter, depending on astronomical conditions.  
 \*\*\*PHYS 182 is offered in both fall and winter quarters.

Sample Physics Major Planner for Transfer Students (2-Year Track)\*, \*\*, \*\*\*

<b>First Year (Juniors)</b>		
	PHYS 112, Thermodynamics and Statistical Mechanics	CMPS 5P, Introduction to Programming in Python <sup>2</sup>
MATH 23B, Vector Calculus <sup>3</sup>	PHYS 116A, Mathematical Methods in Physics	PHYS 116B, Mathematical Methods in Physics
PHYS 5D, Introduction to Physics	PHYS 102, Modern Physics	Physics Elective
<b>Second Year (Seniors)</b>		
PHYS 116C, Mathematical Methods in Physics	PHYS 110A, Electrodynamics	PHYS 110B, Electrodynamics
PHYS 105, Mechanics	PHYS 134, Advanced Lab	PHYS 139A, Quantum Mechanics
PHYS 133, Intermediate Lab	PHYS 182, Scientific Communication for Physicists <sup>4</sup>	Physics Elective

\*For this track, students must have taken the equivalent of PHYS 5ABC (with labs), MATH 19AB or 20AB, and MATH 23A prior to arrival at UCSC. They must also be willing to do their senior thesis in their senior year in addition to the full load of courses, staying during the summer to finish the thesis if needed.

\*\*If a student has also taken the equivalent of CHEM 1A (or AMS 5 or MATH 23B, thereby creating room for CHEM 1A) prior to arrival, they can construct a two-year applied physics track by replacing PHYS 139A with the third elective required for the applied physics B.S.

\*\*\*The three-year track (detailed below) allows more time for undergraduate research and independent study; students are encouraged to discuss both tracks with their faculty mentor.

1-Students who have taken the equivalent of AMS 5 prior to arrival can take CMPS 5P or equivalent in the fall, freeing up an elective slot in the spring.

2-This course satisfies the programming requirement for the physics major; there are other courses that also do the same.

3-Students who have taken the equivalent of MATH 23B in community college can take CMPS 5P or equivalent in the fall, freeing up an elective slot in the spring.

4-PHYS 182 is offered in both fall and winter and is associated with the senior thesis. If the student wishes to take an elective course in the winter term instead of the spring, they can take PHYS 182 in the fall, PHYS 133 (offered in both fall and winter) in the winter, and PHYS 134 (offered in both winter and spring) in the spring.

Sample Physics Major Planner for Transfer Students (3-Year Track)^

<b>First Year</b>		
MATH 23B, Vector Calculus <sup>1</sup>	PHYS 116A, Mathematical Methods in Physics	CMPS 5P, Introduction to Programming in Python <sup>2</sup>
PHYS 5D, Introduction to Physics	PHYS 102, Modern Physics	PHYS 116B, Mathematical Methods in Physics
<b>Second Year</b>		
PHYS 116C, Mathematical Methods in Physics	PHYS 110A, Electrodynamics	PHYS 110B, Electrodynamics
PHYS 105, Mechanics	PHYS 133, Intermediate Lab	PHYS 139A, Quantum Mechanics
	PHYS 112, Thermodynamics and Statistical Mechanics	PHYS 134, Advanced Lab
<b>Third Year</b>		
Physics Elective	PHYS 182, Scientific Communication for Physicists <sup>3</sup>	Physics Elective
Senior Thesis	Senior Thesis	
Independent Study		

1-Students who have taken the equivalent of MATH 23B in community college can take CMPS 5P or equivalent in the fall, freeing up an elective slot in the spring.

2-This course satisfies the programming requirement for the physics major; there are other courses that also do the same.

3-PHYS 182 is offered in both fall and winter and is associated with the senior thesis. If the student wishes to take an elective course in the winter term instead of the spring, they can take PHYS 182 in the fall.

4-PHYS 182 is offered in both fall and winter and is associated with the senior thesis. If the student wishes

to take an elective course in the winter term instead of the spring, they can take PHYS 182 in the fall, PHYS 133 (offered in both fall and winter) in the winter, and PHYS 134 (offered in both winter and spring) in the spring.

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### COMPREHENSIVE REQUIREMENT

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The comprehensive exit requirement is normally satisfied by the submission and approval of a thesis. To satisfy the comprehensive requirement via a thesis Physics 182 is required. Note that successful completion of Physics 182 and the senior thesis satisfies the Disciplinary Communication requirement.

In special cases, minor modifications of these requirements may be granted to suit the specific program of a particular student. Before embarking on a program needing such waivers, students should discuss their plans with their faculty mentor and seek approval by petition from the Physics Department office.

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### HONORS

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The department awards "honors" (3.5 grade point average or better) and "highest honors" (3.8 GPA or better) to top graduating students each year. Recommendations for these awards are made by the department chair and are based upon excellence of academic performance, particularly in upper-division physics courses, as reflected in grades and the narrative evaluations. The department also awards "honors" for outstanding work on the senior thesis, made upon the recommendation of the senior thesis supervisor and the thesis technical adviser.

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### MINOR REQUIREMENTS

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Requirements for the minor in physics include Physics 5A/L, 5B/M, 5C/N, 5D (or Physics 6A/L, 6B/M, 6C/N with minimum GPA of 3.5); Mathematics 19A or 20A, 19B or 20B, 23A, 23B or Physics 14; Physics 102, 133, and 134 and three courses chosen from physics upper-division elective (some of which have prerequisites), or from a list of courses from other departments approved by the Physics Undergraduate Committee. See the Physics Department for the listing.

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### ADVISING AND PREPARATION FOR THE MAJOR

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Because the courses for the physics major are sequential, it is strongly advised that students declare their major in physics, astrophysics, or applied physics as early as possible (either at initial registration or by the end of the first year, if possible). Students who do not begin the lower-division requirements during their first year will have difficulty completing the program

within four years. Transfer students may also have problems completing the program within the usual time, depending upon whether they took equivalent courses at their previous institutions. The divisional undergraduate adviser 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.

High school students coming directly to UCSC should emphasize their mathematics preparation with the expectation that they will take calculus in their first quarter at UCSC in order to concurrently take the Physics 5 series, calculus-based physics for physics majors.

Students transferring to UCSC as junior physics, astrophysics, or applied physics majors should have completed three quarters of introductory calculus-based physics with laboratory and three quarters of calculus. It is also desirable to have an introductory course in modern physics as well as mathematics courses in linear algebra, vector calculus, and differential equations. The Physics Department advises each junior transfer student individually upon their arrival.

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### GRADUATE PROGRAMS

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The Physics Department offers graduate programs leading to the master of science (M.S.) and/or the doctor of philosophy (Ph.D.) degrees. In the first year of study, Ph.D. students are expected to take two core graduate-level courses per quarter, including the courses required for the Ph.D. degree (210, 212, 214, 215, 216, 219) and other courses specific to the student's field of interest. All first-year students also take 205, Introduction to Research. All graduate students also attend a weekly colloquium, 292. Each student has a faculty adviser 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). After passing a written qualifying examination, Ph.D. students pursue independent research leading to an oral examination and completion of a doctoral dissertation.

Students may obtain a master's degree through coursework (eight physics graduate courses) and

## Physics

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 adviser 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): the Santa Cruz Institute for Particle Physics (SLAC) and Lick Observatory (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 Stanford Linear Accelerator Center 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 our web site at <http://physics.ucsc.edu/> or by contacting the Division of Graduate Studies at <http://graddiv.ucsc.edu>.

### FIVE-YEAR B.S./M.S. PROGRAM

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The five-year combined B.S./M.S. in physics program provides highly motivated undergraduate majors the opportunity to earn a M.S. degree in five years. The program provides the additional level of preparation and experience that students need to pursue careers in industry and government. Students in the B.S./M.S. physics program can pursue concentrations in materials and device physics, energy and the environment, computational physics, finance and economics, and medical biophysics. Students apply to be admitted to the B.S./M.S. program, in consultation with their faculty or undergraduate advisor, no later than the end of the second quarter of the junior year. To be accepted to the program, students will need to have demonstrated solid performance in general and in the major, as demonstrated by: 1) a G.P.A. in physics courses of at least 3.0; 2) an overall G.P.A. of at least 3.0; and 3) a recommendation from a faculty member

attesting to the student's promise for the M.S. degree in physics.

Applied Physics majors are strongly advised to take Physics 139A as one of their electives. The Five-year B.S./M.S. program is not suitable for Physics Education Majors.

### Course Requirements

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All students in the 5-year BS/MS program will be expected to take a core set of four physics courses, including:

PHYS 212. Electromagnetism I;

PHYS 215. Introduction to Non-Relativistic Quantum Mechanics;

PHYS 216. Advanced Topics in Non-Relativistic Quantum Mechanics

PHYS 219. Statistical Physics;

plus four electives in the concentration areas described below. Typically, at least one of these electives will be another physics graduate course. One of the elective courses can be an upper-division undergraduate course upon approval of the faculty coordinator and Graduate Committee.

Two of these elective courses can also serve to fulfill the elective requirement for the B.S. degree.

### Materials and Device Physics

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This concentration prepares students who are interested in pursuing industrial jobs in the areas of materials science, semiconductors, and optoelectronic devices.

Elective courses include AMS 205A, CHEM 261, CHEM 269, CE 218, CE 218L, EE 211, EE 223, EE 224 EE 225, EE 231, PHYS 231, PHYS 232, PHYS 233, PHYS 242.

### Energy and the Environment

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This concentration prepares students who are interested in pursuing industrial or government jobs in the areas of sustainable-energy technologies, environmental and climate change and scientific policy related to these areas.

Elective courses include CHEM 268, CHEM 269, EPS 220, EPS 254, EPS 272, EPS 280D, ECON 250, ECON 259B, ENVS 271, PHYS 233, PHYS 242.

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**COMPUTATIONAL PHYSICS**


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This concentration prepares students who are interested in pursuing industrial or government jobs in the areas related to using computational methods to solve applied problems as well as computer-based visualization methods for data presentation. Students interested in computational methods in biology could also consider the concentration in medical biophysics.

Elective courses include AMS 215, BMSE 205, BMSE 211, BMSE 230, BMSE 203L, CHEM 265, CE 215, CS 203, CS 210, CS 211, CS 240, CS 261, PHYS 242.

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**MEDICAL BIOPHYSICS**


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This concentration prepares students who are interested in pursuing industrial and hospital jobs in the areas of medical technology, biomolecular engineering, and biophysics.

Elective courses include AMS 215, BMSE/CHEM 255, BMSE 205, BMSE 215, BMSE 220, BMSE 220L, BMSE 222, BMSE 230, BMSE 203L, BMSE 250, BMSE 250L, CHEM 200A, EE 212, MCDB 200B, PHYS 180.

**Course Schedule**

Year	Fall	Winter	Spring
4th (senior)	Elective*	Elective*	PHYS 219
			Elective*
5th	PHYS 212	PHYS 215	PHYS 216
	Elective*	Elective*	Elective*
	Thesis	Thesis	Thesis

Students may find it helpful to start their master's thesis during the summer at the end of their fourth year.

\*Alternate quarters for completing the four electives

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**FACULTY AND PROFESSIONAL INTERESTS**


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**PROFESSOR**


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**Anthony N. Aguirre**

Cosmology of the early and late universe: inflation and the global structure of cosmological models; the intergalactic medium and its enrichment with heavy elements; galaxy formation, evolution, and feedback processes; dark matter; theories of modified gravity

**Thomas Banks**

String and particle theory, quantum gravity, and cosmology

**David P. Belanger**

Experimental condensed matter physics, phase transitions

**Frank G. Bridges, Emeritus**
**George Brown, Emeritus**
**Sue A. Carter**

Experimental condensed matter physics, polymer physics, molecular electronics, phase transitions, electronic and optical properties of materials

**Joshua M. Deutsch**

Condensed matter theory

**Michael Dine**

Theory of elementary particles

**David E. Dorfan, Emeritus**
**George D. Gaspari, Emeritus**
**Howard E. Haber**

Theory and phenomenology of fundamental particles and their interactions

**Clemens A. Heusch, Emeritus**
**Robert P. Johnson**

Experimental high-energy physics, astrophysics

**David Lederman**

Condensed matter physics/materials science, experimental

**Onuttom Narayan**

Theoretical condensed matter physics

**Michael Nauenberg, Emeritus**
**Joel R. Primack, Emeritus**
**Stefano Profumo**

Theory of particle physics and particle astrophysics

**Arthur Ramirez**

Experimental materials physics

**Steven Ritz**

Particle physics and astrophysics

**Matthew Sands, Emeritus**

**Zack Schlesinger**

Experimental condensed matter physics, infrared and optical spectroscopy, strongly correlated electron systems, novel materials, negative thermal expansion, underconstraint and geometrical frustration

**Bruce Schumm**

Experimental particle physics

**Peter L. Scott , Emeritus**

**Abraham Seiden**

Experimental high-energy physics

**Sriram Shastry**

Condensed matter physics, strongly correlated matter, Mott-Hubbard physics, high Tc superconductivity, quantum magnetism, exactly integrable systems, exactly solvable models of many-body systems and in statistical mechanics, quantum chaos, geometric frustration

**David M. Smith**

High-energy astrophysics; X-ray and gamma-ray detectors and instrumentation; solar, terrestrial, and planetary sources of gamma radiation

**A. Peter Young, Emeritus**

ASSOCIATE PROFESSOR

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**Jason Nielsen**

Experimental high-energy physics

**Alexander Sher**

Development of experimental techniques for recording and stimulation of activity at hundreds of neurons and use of these techniques to study neural function, structure, and development

ASSISTANT PROFESSOR

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**Michael Hance**

Experimental high-energy physics

**Tesla Jeltema**

High-energy astrophysics and cosmology

**Jairo Velasco**

Experimental materials science, low dimensional materials

LECTURER

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**Adriane Steinacker**

Planet formation, MHD simulations

**Stephanie Bailey**

Modeling and simulation of human rights violations and health outcomes, public policy, health policy, health outcomes, stochastic and deterministic modeling, cancer research



PROFESSOR

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**George R. Blumenthal (Astronomy and Astrophysics)**

Cosmology, galaxy formation, high-energy astrophysics

**Pascale Garaud (Applied Mathematics and Statistics)**

Astrophysics, geophysics, fluid dynamics, numerical resolutions of differential equations, and mathematical modeling of natural flows

**Joel A. Kubby (Electrical Engineering)**

Micro-Electro-Mechanical-Systems (MEMS), adaptive optics (AO), optical-MEMS, bio-MEMS, bioimaging, AO microscopy, AO astronomy

**Wentai Liu (Electrical Engineering)**

Retinal prosthesis, biomimetic systems, integrated neuro-electronics, molecular electronics, CMOS and SOI transceiver design, current mode band limited signaling, microelectronic sensor, timing/clock recovery and optimization, noise characterization and modeling, and computer vision/image processing

**William G. Mathews, Emeritus**

**Richard Montgomery (Mathematics)**

Celestial mechanics, differential geometry, gauge theory, mechanics (quantum and classical), and control theory

**Ali Shakouri (Electrical Engineering)**

Quantum electronics, nano- and microscale heat and current transport in semiconductor devices; thermoelectric/thermionic energy conversion; renewable energy sources; thermal imaging; micro-refrigerators on a chip; and optoelectronic integrated circuits

ASSISTANT PROFESSOR

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**Holger Schmidt (Electrical Engineering)**

Integrated optics for biomedicine and quantum optics, nano-magenta-optics, semiconductor physics, optoelectronic and photonic devices, ultrafast optics, quantum interference

**Johannes Walcher (Mathematics)**

String theory, mirror symmetry, mathematical and particle physics

## ADJUNCT PROFESSOR

**William Atwood**  
**Donald Coyne, Emeritus**  
**Alan Litke**  
**Michael Riordan**  
**Hartmut F.-W. Sadrozinski**  
**Terry L. Schalk**  
**David A. Williams**

## RESEARCH PHYSICIST

**Al Eisner, Emeritus**  
**Vitaliy Fadeyev**  
**Alexander Grillo**  
**William Lockman**  
**Troy Porter**

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**PHYSICS COURSES**


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**LOWER-DIVISION COURSES**


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**1. Conceptual Physics. W**

Topics in classical and quantum physics and their relation to physical phenomena in the world around us, including modern electronics. Concepts are stressed, but some practical calculational techniques are developed. Working knowledge of high school algebra and geometry is essential. (General Education Code(s): SI, IN, Q.) The Staff

**2. Elementary Physics of Energy. S**

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. (General Education Code(s): PE-E.) S. Bailey

**5A. Introduction to Physics I. F,W**

Elementary mechanics. Vectors, Newton's laws, inverse square force laws, work and energy, conservation of momentum and energy, and oscillations. Prerequisite(s): concurrent enrollment in course 5L and

Mathematics 19A or 20A is required. Enrollment restricted to biochemistry and molecular biology, chemistry, Earth sciences, engineering, and physics majors, minors, and proposed majors. (General Education Code(s): MF, IN, Q.) A. Durand, J. Nielsen

**5B. Introduction to Physics II. W**

A continuation of 5A. Wave motion in matter, including sound waves. Geometrical optics, interference and polarization, statics and dynamics of fluids. Prerequisite(s): courses 5A/L and Mathematics 19A or 20A; concurrent enrollment in course 5M is required. Corequisite: Mathematics 19B or 20B. (General Education Code(s): SI, IN.) A. Steinacker

**5C. Introduction to Physics III. S**

Introduction to electricity and magnetism. Electromagnetic radiation, Maxwell's equations. Prerequisite(s): courses 5A/L and Mathematics 19B or 20B. Concurrent enrollment in course 5N is required. (General Education Code(s): SI, IN.) A. Sher

**5D. Introduction to Physics IV. F**

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. (Formerly Heat, Thermodynamics, and Kinetics) Prerequisite(s): courses 5A/L or 6A/L and Mathematics 19B or 20B. T. Jeltema

**5I. Introduction to Physics Honors I (2 credits). \***

Weekly 90-minute section covering advanced and modern topics. Topics may include the theory of relativity; complicated dynamics (air resistance, planetary dynamics, etc.); fallacies in perpetual-motion machines; the Euler disk and unusual tops; elasticity of materials applied to structures. Concurrent enrollment in course 5A is required. The Staff

**5J. Introduction to Physics Honors II (2 credits). \***

Weekly 90-minute section covering advanced and modern topics. Topics may include nonlinear oscillators and chaos; waves in deep water and inside the earth; redshift in astronomy; negative refractive index materials; photons and matter waves; holography; viscosity; and turbulence. Concurrent enrollment in course 5B is required. The Staff

**5K. Introduction to Physics Honors III (2 credits). \***

Weekly 90-minute section covering advanced and modern topics.

## Physics

Topics may include atmospheric electricity; shielding; tensor polarization; alternative energy sources; semiconductor devices; particle accelerators and relativistic electrodynamics; Thomson scattering; digital and analog communication. Concurrent enrollment in course 5C is required. The Staff

### **5L. Introduction to Physics Laboratory (1 credit). F,W**

Laboratory sequence illustrating topics covered in course 5A. One three-hour laboratory session per week. Prerequisite(s): concurrent enrollment in course 5A is required. The Staff

### **5M. Introduction to Physics Laboratory (1 credit). W**

Laboratory sequence illustrating topics covered in course 5B. One three-hour laboratory session per week. Prerequisite(s): courses 5A/L; concurrent enrollment in course 5B is required. The Staff

### **5N. Introduction to Physics Laboratory (1 credit). S**

Laboratory sequence illustrating topics covered in course 5C. One three-hour laboratory session per week. Prerequisite(s): courses 5A/L. Concurrent enrollment in 5C is required. Courses 5B/M recommended. The Staff

### **6A. Introductory Physics I. F,W,S**

Elementary mechanics. Vectors, Newton's laws, inverse square force laws, work and energy, conservation of momentum and energy, and oscillations. Prerequisite(s): Concurrent enrollment in course 6L required. Corequisite(s): Mathematics 11A or 19A or 20A or Applied Mathematics and Statistics 15A. (General Education Code(s): MF, IN, Q.) (W) Z. Schlesinger, (FS) A. Steinacker

### **6B. Introductory Physics II. W,S**

A continuation of 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; introduction to electricity and magnetism.

Prerequisite(s): course 5A/L or 6A/L; and Mathematics 11A or 19A or 20A or Applied Mathematics and Statistics 15A. Corequisite(s): Mathematics 11B or 19B or 20B. (General Education Code(s): SI, IN.) S. Bailey

### **6C. Introductory Physics III. F,S**

Introduction to electricity and magnetism. Elementary circuits; Maxwell's equations; electromagnetic radiation; interference and polarization of light. Prerequisite(s): courses 5A/L or 6A/L, and Mathematics 11B or 19B or 20B or Applied Mathematics and Statistics 15B. (General Education Code(s): SI, IN.)(F) S. Bailey, (S) A. Steinacker

### **6L. Introductory Physics Laboratory (1 credit). F,W,S**

Laboratory sequence illustrating topics covered in course 6A. One three-hour laboratory session per week. Prerequisite(s): Previous or concurrent enrollment in course 6A required. The Staff

### **6M. Introductory Physics Laboratory (1 credit). W,S**

Laboratory sequence illustrating topics covered in course 6B. One three-hour laboratory session per week. Prerequisite(s): courses 5A, 6A, or 7A and 5L, 6L or 7L; and previous or concurrent enrollment in course 6B. The Staff

### **6N. Introductory Physics Laboratory (1 credit). F,S**

Laboratory sequence illustrating topics covered in course 6C. One three-hour laboratory session per week. Prerequisite(s): courses 6A and 6L; previous or concurrent enrollment in course 6C; courses 6B and 6M are recommended. The Staff

### **11. The Physicist in Industry (2 credits). W**

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. Enrollment limited to 15. S. Carter

### **42. Student-Directed Seminar.**

Seminars taught by upper-division students under faculty supervision. (See course 192.) The Staff

### **99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. The Staff

## UPPER-DIVISION COURSES

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### **102. Modern Physics. F,W**

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(s): courses 5A/L, and 5B/M, and 5C/N and 5D; or 6A/L, and 6B/M, and 5D; or equivalent. R. Johnson, D. Belanger

### **105. Mechanics. F**

Particle dynamics in one, two, and three dimensions. Conservation

## Physics

laws. Small oscillations, Fourier series and Fourier integral solutions. Phase diagrams and nonlinear motions, Lagrange's equations, and Hamiltonian dynamics. Prerequisite(s): courses 5A/L and 116A-B. J. Deutsch

### **107. Introduction to Fluid Dynamics. F**

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 Applied Mathematics and Statistics 217. (Also offered as Applied Math and Statistics 107. Students cannot receive credit for both courses.) Prerequisite(s): Mathematics 107 or Physics 116C or Earth and Planetary Sciences 111. The Staff

### **110A. Electricity, Magnetism, and Optics. W**

Maxwell's equations, electrostatics, magnetostatics, induction, electromagnetic waves, physical optics, and circuit theory. Prerequisite(s): 116A-B-C. S. Ritz

### **110B. Electricity, Magnetism, and Optics. S**

Maxwell's equations, electrostatics, magnetostatics, induction, electromagnetic waves, physical optics, and circuit theory. Prerequisite(s): courses 110A and 116C. D. Lederman

### **112. Thermodynamics and Statistical Mechanics. W**

Consequences of the first and second laws of thermodynamics, elementary statistical mechanics, thermodynamics of irreversible processes. Prerequisite(s): course 5D, and course 116C or Applied

Mathematics and Statistics 5 or Mathematics 23A/B. Concurrent enrollment in course 101B or 102 or 116A is required. R. Johnson

### **115. Computational Physics. S**

This course will apply 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 will apply a high-level programming language, such as Mathematica, to the solution of physical problems and develop appropriate error and stability estimates. Prerequisite(s): courses 101B or 102, and 105 and 116A-B-C, or equivalent. Basic programming experience in C or Fortran. No previous experience with Mathematica is required. O. Narayan

### **116A. Mathematical Methods in Physics. W**

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(s): Mathematics 23A and 23B. T. Jeltema

### **116B. Mathematical Methods in Physics. S**

Complex functions, complex analysis, Fourier series and transforms, Dirac-delta function, Green's functions, asymptotic series and expansions, special functions defined by integrals, and calculus of variations. Prerequisite(s): course 116A and Mathematics 23A and 23B. A. Ramirez

### **116C. Mathematical Methods in Physics. F**

Series solutions of ordinary equations, Legendre polynomials, Bessel functions, sets of orthogonal functions, partial differential equations, probability and statistics. Prerequisite(s): courses 116A-B and Mathematics 23A and 23B. A. Aguirre

### **120. Polymer Physics. \***

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 course 240. Prerequisite(s): courses 112 and 116B. Offered in alternate academic years. J. Deutsch

### **129. Nuclear and Particle Astrophysics. W**

The standard model of particle physics; general relativistic cosmology; the early universe and Big Bang nucleosynthesis; dark matter and structure formation; formation of heavy elements in stars and supernovae; neutrino oscillations; high-energy astrophysics: cosmic rays and gamma-ray astronomy. (Formerly Nuclear and Particle Physics.) Prerequisite(s): courses 5D, and 101B or 102, and Mathematics 23B; students with equivalent coursework may contact instructor for permission to enroll. M. Hance

### **133. Intermediate Laboratory. F,W**

Demonstration of phenomena of classical and modern physics. Development of a familiarity with

## Physics

experimental methods. Special experimental projects may be undertaken by students in this laboratory. Prerequisite(s): course 101A or 102. (General Education Code(s): SR.) (F) A. Ramirez, (W) B. Schumm

### **134. Physics Advanced Laboratory. W,S**

Individual experimental investigations of basic phenomena in atomic, nuclear, and solid state physics. Prerequisite(s): courses 133, and 101B or 102. May be repeated for credit. (W) A. Ramirez, (S) S. Carter

### **135. Astrophysics Advanced Laboratory. \***

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: 135A in fall and 135B in winter, depending on astronomical conditions. (Also offered as Astronomy and Astrophysics 135. Students cannot receive credit for both courses.) Prerequisite(s): course 133 and at least one astronomy course. Intended primarily for juniors and seniors majoring or minoring in astrophysics. The Staff

### **135A. Astrophysics Advanced Laboratory (3 credits). F**

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 135 in fall, depending on astronomical conditions. (Also offered as Astronomy and

Astrophysics 135A. Students cannot receive credit for both courses.) Prerequisite(s): course 133 and at least one astronomy course. G. Brown

### **135B. Astrophysics Advanced Laboratory (2 credits). W**

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 135 in fall, depending on astronomical conditions. (Also offered as Astronomy and Astrophysics 135B. Students cannot receive credit for both courses.) Prerequisite(s): course 133 and at least one astronomy course. G. Brown

### **136. Advanced Astronomy Laboratory. S**

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(s): Earth Sciences 119 and Physics 133. Enrollment restricted to junior and senior astrophysics majors. Enrollment limited to 12. J. Prochaska

### **139A. Quantum Mechanics. S**

The principles and mathematical techniques of nonrelativistic quantum mechanics: the Schrödinger equation, Dirac notation, angular momentum, approximation methods, and scattering theory. Offered in spring. Prerequisite(s): courses 101B or 102, and 116A-B-C. S. Ritz

### **139B. Quantum Mechanics. F**

The principles and mathematical techniques of nonrelativistic quantum mechanics: the Schrödinger equation, Dirac notation, angular momentum, approximation methods, and scattering theory. Offered in fall. Prerequisite(s): courses 101B or 102, and 139A and 116ABC. M. Dine

### **143. Supervised Teaching (2 credits). \***

Supervised tutoring in selected introductory courses. Students should have completed course 101A and 101B as preparation. Students submit petition to sponsoring agency. The Staff

### **152. Optoelectronics. \***

The first half of the course covers the theory of optoelectronics including wave, electromagnetic, and photon optics, modulation of light by matter, and photons in semiconductors. The second half covers applications including displays, lasers, photodetectors, optical switches, fiber optics, and communication systems. Prerequisite(s): courses 101B or 102, and 110A. The Staff

### **155. Solid State Physics. W**

Interatomic forces and crystal structure, diffraction, lattice vibrations, free electron model, energy bands, semiconductor theory and devices, optical properties, magnetism, magnetic resonance, superconductivity. Prerequisite(s): courses 112 and 139A; students with equivalent coursework may contact instructor for permission to enroll. Z. Schlesinger

### **156. Applications of Solid State Physics. \***

Emphasizes the application of condensed matter physics to a variety of situations. Examples

## Physics

chosen from subfields such as semiconductor physics, lasers, superconductivity, low temperature physics, magnetism, and defects in crystals. Prerequisite(s): courses 101B or 102. A. Ramirez

### **160. Practical Electronics. \***

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(s): courses 5C and 5N or 6C and 6N. The Staff

### **171. General Relativity, Black Holes, and Cosmology. F**

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. (Also offered as Astronomy and Astrophysics 171. Students cannot receive credit for both courses.) Prerequisite(s): courses 105, 110A, 110B, and 116A/B. H. Haber

### **180. Biophysics. S**

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(s): course 112;

students who have a biochemistry background may contact instructor for permission. Enrollment restricted to juniors and seniors. (General Education Code(s): PR-E.) J. Deutsch

### **182. Scientific Communication for Physicists. F,W**

Explores the communication of physics to a wide range of audiences, including writing articles from the popular to the peer-reviewed level; critically analyzing the communication of scientific discoveries in the media; structuring the physics senior thesis; writing grant applications; assembling a personal statement for job and graduate school application; and assembling and critiquing oral presentations. Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements. Enrollment restricted to junior and senior majors in physics, astrophysics, applied physics, or physics education. Enrollment limited to 35. (General Education Code(s): W.) (F) D. Belanger, (W) A. Steinacker

### **191. Teaching Practicum. F,W,S**

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. The Staff

### **192. Directed Student Teaching. F,W,S**

Teaching of a lower-division seminar under faculty supervision. (See course 42.) Prerequisite(s): upper-division standing; submission of a proposal supported

by a faculty member willing to supervise. The Staff

### **199. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits).**

Tutorial. May be repeated for credit. The Staff

## GRADUATE COURSES

### **205. Introduction to Research in Physics (2 credits). W**

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. Enrollment restricted to graduate students or by permission of instructor. R. Johnson

### **210. Classical Mechanics. F**

Generalized coordinates, calculus of variations, Lagrange's equations with constraints, Hamilton's equations, applications to particle dynamics including charged particles in an electromagnetic field, applications to continuum mechanics including fluids and electromagnetic fields, introduction to nonlinear dynamics. Enrollment restricted to graduate students only, except by permission of instructor. A. Sher

### **212. Electromagnetism I. F**

Electrostatics and magnetostatics, boundary value problems with spherical and cylindrical symmetry, multipole expansion, dielectric media, magnetic materials, electromagnetic properties of materials, time-varying electromagnetic fields, Maxwell's equations, conservation laws, plane electromagnetic waves and

## Physics

propagation, waveguides and resonant cavities. Enrollment restricted to graduate students only, except by permission of instructor. Offered in alternate academic years. J. Deutsch

### **214. Electromagnetism II. W**

Lorentz covariant formulation of Maxwell's equations, dynamics of relativistic charged particles and electromagnetic fields, scattering and diffraction. Topics in classical radiation theory: simple radiating systems radiation by moving charges, multipole radiation, synchrotron radiation, Cerenkov radiation, bremsstrahlung and radiation damping. Prerequisite(s): course 212. Enrollment restricted to graduate students only, except by permission of instructor. Offered in alternate academic years. O. Narayan

### **215. Introduction to Non-Relativistic Quantum Mechanics. W**

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. Enrollment restricted to graduate students only, except by permission of instructor. S. Profumo

### **216. Advanced Topics in Non-Relativistic Quantum Mechanics. S**

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(s): course 215. Enrollment restricted to graduate students only, except by permission of instructor. J. Nielsen

### **217. Quantum Field Theory I. F**

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(s): course 216. Enrollment restricted to graduate students only, except by permission of instructor. S. Profumo

### **218. Quantum Field Theory II. W**

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(s): course 217. Enrollment restricted to graduate

students only, except by permission of instructor. H. Haber

### **219. Statistical Physics. S**

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. Enrollment restricted to graduate students only, except by permission of instructor. O. Narayan

### **220. Theory of Many-Body Physics. S**

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(s): courses 216 and 219. Enrollment restricted to graduate students only, except by permission of instructor. Offered in alternate academic years. S. Shastry

### **221A. Introduction to Particle Physics I. F**

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(s): course 217 or concurrent enrollment. Enrollment restricted to graduate students only, except by permission of instructor. B. Schumm

**221B. Introduction to Particle Physics II. W**

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(s): course 221A; course 217 or concurrent enrollment. Enrollment restricted to graduate students only, except by permission of instructor. J. Nielsen

**222. Quantum Field Theory III. S**

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(s): courses 218 and 221B. Enrollment restricted to graduate students only, except by permission of instructor. Offered in alternate academic years. M. Dine

**224. Particle Astrophysics and Cosmology. S**

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. (Formerly Origin and

Evolution of the Universe.) (Also offered as Astronomy and Astrophysics 224. Students cannot receive credit for both courses.) Enrollment restricted to graduate students only, except by permission of instructor. Offered in alternate academic years. A. Aguirre

**226. General Relativity. W**

Develops the formalism of Einstein's general relativity, including solar system tests, gravitational waves, cosmology, and black holes. (Also offered as Astronomy and Astrophysics 226. Students cannot receive credit for both courses.) Enrollment restricted to graduate students only, except by permission of instructor. A. Aguirre

**227. Advanced Fluid Dynamics. \***

Fundamentals of heat transfer and fluid flow: thermal convection, gravity waves, vortex dynamics, viscous flows, instabilities, turbulence, and compressible flows. Students develop computer program for simulating thermal convection and gravity waves. Vector calculus and computer programming experience required. (Formerly Fluid Dynamics.) An introductory course in fluid dynamics recommended as preparation. Enrollment restricted to graduate students. Offered in alternate academic years. The Staff

**231. Introduction to Condensed Matter Physics. F**

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(s): course 216. Enrollment restricted to graduate students only, except by permission of instructor. S. Shastry

**232. Condensed Matter Physics. W**

Magnetism (para, ferro, anti-ferro, ferri), spin waves, superconductivity, introduction to semiconductors. Prerequisite(s): course 231. Enrollment restricted to graduate students only, except by permission of instructor. S. Shastry

**233. Advanced Condensed Matter Physics. \***

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(s): course 231. Enrollment restricted to graduate students only, except by permission of instructor. Offered in alternate academic years. S. Carter

**234. Soft Condensed Matter Physics. \***

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(s): courses 219 and 232. Enrollment restricted to graduate students. A. Young, O. Narayan

**240. Polymer Physics. \***

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 course 120.

## Physics

Enrollment restricted to graduate students only, except by permission of instructor. Offered in alternate academic years. J. Deutsch

### **242. Computational Physics. S**

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(s): basic programming experience in C or Fortran. No previous experience with Mathematica is required.

Enrollment restricted to graduate students only, except by permission of instructor. Z. Schlesinger

### **250. Mathematical Methods. \***

Probability theory with applications to data analysis, complex variables, Cauchy's residue theorem, dispersion relations, saddle-point type asymptotic methods for integrals, integral transforms, ordinary differential equations and orthogonal polynomials, partial differential equations and boundary value problems, and Green's functions. Integral equations also included if time permits. Enrollment restricted to graduate students. A. Young

### **251. Group Theory and Modern Physics. \***

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.

Enrollment restricted to graduate students only, except by permission of instructor. Offered in alternate academic years. H. Haber

### **290. Special Topics. \***

A series of lectures on various topics of current interest in physics at UC Santa Cruz. Enrollment restricted to graduate students only, except by permission of instructor. May be repeated for credit. The Staff

### **291A. Cosmology (2 credits). F,W,S**

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. Enrollment restricted to graduate students only, except by permission of instructor. J. Primack

### **291B. X-rays and Magnetism (2 credits). F,W,S**

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. Enrollment is restricted to graduate students. May be repeated for credit. P. Fischer

### **291C. Developments in Theoretical Particle Physics (2 credits). F,W,S**

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(s): course 218; enrollment restricted to graduate students. May be repeated for credit. M. Dine, H. Haber

### **291D. Experimental High-Energy Collider Physics (2 credits). F,W,S**

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. Enrollment restricted to graduate students. May be repeated for credit. J. Nielsen

### **291E. Applied Physics (2 credits). F,W,S**

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. Enrollment restricted to graduate students. May be repeated for credit. G. Alers, S. Carter

### **291F. Experimental High-Energy and Particle Astrophysics Seminar (2 credits). F,W,S**

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. Enrollment restricted to graduate students. Enrollment limited to 15. May be repeated for credit. D. Smith

Physics

**291G. Condensed Matter Physics Research Seminar (2 credits). F,W,S**

Weekly seminar series covering topics of current interest in condensed matter physics. Local and external speakers discuss their work. Enrollment restricted to graduate students. May be repeated for credit. A. Young

**292. Seminar (no credit). F,W,S**

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. Enrollment restricted to graduate students only, except by permission of instructor. The Staff

**297. Independent Study. F,W,S**

Enrollment restricted to graduate students only, except by permission of instructor. The Staff

**298. Theoretical and Experimental Research Project. F,W,S**

Enrollment restricted to graduate students only, except by permission of instructor. The Staff

**299. Thesis Research. F,W,S**

Enrollment restricted to graduate students only, except by permission of instructor. The Staff

\* Not offered in 2015-16

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# POLITICS

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2015-16 General Catalog

25 Merrill College

(831) 459-2855

[politics@ucsc.edu](mailto:politics@ucsc.edu)

<http://politics.ucsc.edu>

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## PROGRAM DESCRIPTION

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In describing the department and major at UCSC, the term politics (rather than political science or government) is used because the study of political life requires a far more inclusive approach than that which is associated with conventional political science methods, and because politics happens in places other than governments. More specifically, the study of politics is the study of the way 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.

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 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.

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, economics, literature, science, and law.

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 houses the legal studies (program (see the legal studies statement for details).

UCSC 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 the theory of justice to the problem of war, from campaign strategy to relations between the rich and the poor countries of the world.

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 UC Center in Sacramento, the UCSC/UC Hastings Law School 3 Plus 3 program in which students earn B.A. and J.D. degrees in six years, and the Education Abroad Program (EAP).

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.

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## PROGRAM LEARNING OUTCOMES

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Upon completion of the major, students will have met the following objectives:

understand the origins, development, and nature of political institutions, practices, and ideas;

place particular political phenomena in broader historical, cross-national, cross-cultural, and theoretical context;

demonstrate familiarity with various theoretical approaches to the study of politics, and their application in different geographic and substantive areas;

critically evaluate arguments about political institutions, practices, and ideas based on logic and evidence;

develop and sustain coherent written and oral arguments regarding political phenomena, theories, and values based on appropriate empirical and/or textual evidence.

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## REQUIREMENTS OF THE MAJOR

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**Two lower-division politics courses.** All students are required to complete and pass two courses from those numbered 1 through 79 prior to declaring the major. These courses are normally taken during the student's first year.

A student who has not been able to satisfy the pre-declaration requirement (a passing grade in two politics lower-division classes) may petition the department for an exception. The letter of petition must explain and document the circumstances that might justify an exception. The department will consider the request and notify the student of its decision within two weeks of receiving the petition or within 10 days of the start of the following quarter, whichever is later.

**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 freshmen.

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### THEORY

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105A Ancient Political Thought

105B Early Modern Political Thought

105C Modern Political Thought

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### U.S. POLITICS

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120A Congress, President, and the Court in American Politics

120B Society and Democracy in American Political Development

120C State and Capitalism in American Political Development

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### COMPARATIVE

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140A Politics of Advanced Industrialized Societies

140C Latin American Politics

140D Politics of East Asia

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### INTERNATIONAL

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160A International Politics

160B International Law

160C Security, Conflict, Violence, War

160D International Political Economy

**Five upper-division politics electives.** Five additional upper-division politics courses, one of which may satisfy the comprehensive requirement described below (see the "Course Description" page for details about these courses).

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## DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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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.

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## COMPREHENSIVE REQUIREMENTS

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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 (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 190 seminar, students must have successfully completed the prerequisite courses listed in the seminar's catalog course description.
- **Additional Elective:** Successful completion of one additional politics upper-division elective that 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 and enroll in a two-credit independent study, Politics 199F as part of this option.
- **Graduate Seminar:** Successful completion of a politics graduate seminar (enrollment is contingent

## Politics

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 (Politics 195A-B-C) 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.

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### INDEPENDENT AND FIELD STUDIES

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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.

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### HONORS

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Honors in the politics major are awarded to graduating seniors, based primarily on a review of grades, whose academic performance is judged to be consistently excellent by a committee of politics faculty. Highest honors in the major are reserved for students with consistently outstanding academic performance.

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### REQUIREMENTS OF THE MINOR

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All students are required to complete and pass one lower-division politics course from those numbered 1 through 79 prior to declaring the minor. Additionally, five upper-division politics courses are required. Of these, four are to be selected from the core courses: two from one subfield and two from another subfield; these courses are listed above. The fifth course is to be selected from courses numbered 101-199.

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### GENERAL UNDERGRADUATE INFORMATION

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**Combined major.** The Politics Department offers a combined major with the Latin American and Latino Studies Department. Requirements may be reviewed in the Latin American and Latino Studies section of the catalog.

**Double majors.** 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 subject.

**Advising.** Declaring the major in politics is a four-step process: 1) complete and pass two lower-division politics courses (numbered 1-79) with a grade of C or better; 2) attend a declaration orientation workshop, 3) meet with a faculty adviser, and 4) meet with the politics undergraduate adviser. Each student meets with a faculty adviser to discuss an intended program of

study, including its breadth and purpose. The faculty adviser may suggest additional courses so that the student can achieve greater breadth or concentration. Students are encouraged to select related courses from other departments which complement their interests in politics.

**Course credit from other institutions.** Courses from another institution may be considered only if they appear on the student's Transfer Credit Summary. Students who wish to substitute courses taken elsewhere for the Politics Department's requirements should discuss the procedure with the department adviser.

**Transfer students.** A student transferring to UCSC must meet with the politics undergraduate adviser as early as possible to discuss declaring the major and course enrollment. This will ensure a smoother transition. Students should bring a copy of their UCSC Transfer Credit Summary which may be printed from the student portal.

A junior transfer student may satisfy the requirement for one of the two lower-division courses by completing an equivalent course in a political science or equivalent department with a grade of C or better. Courses from another institution may be considered only if they appear on the UCSC Transfer Credit Summary.

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## GRADUATE PROGRAM

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### THE FACULTY

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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

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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, 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.

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### TEACHING

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 web site, <http://politics.ucsc.edu>, 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 web site.

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### PH.D. PROGRAM 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 Politics 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 Logics of Inquiry Seminar**

**Required Core Seminars:** During the first two years in residence, students are required to take three of the

## Politics

four core seminars that correspond to the areas of emphasis: Politics 200A, Political and Social Thought; Politics 200B, Social Forces and Political Change; Politics 200C, Political Institutions and States; and Politics, 200D Political Economy. The core seminars provide a broad foundation for research in politics and offer structured opportunities to foster a community of scholarship within the program.

**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.

### 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 adviser language and method requirements appropriate to the student's project, graduate education, and career goals.

### Politics Qualifying Examination

The **Qualifying Examination (QE)** process is intended 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 her/his research trajectory. It is also intended to provide a forum for the student to specify and develop her/his research question and plan for the dissertation.

A student's preparation for the QE process begins with the first core seminar and continues throughout the required coursework. The QE process itself is completed during a student's third year. It has three components: 1) two written examinations (take-home examinations or field statements); 2) the dissertation prospectus; and 3) an oral examination. The specific

deadlines for each component are available from the graduate adviser.

We encourage students to consult with their politics faculty advisers regarding the two written examination options. Students must complete the QE process to advance to Ph.D. candidacy by the end of their third year in the program. If the student fails any component of the QE process twice, she/he will not be permitted to continue in the program. On this schedule, students are expected to complete the degree in five to six years.

### DESIGNATED EMPHASIS

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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

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.**

- The student must have a designated faculty adviser from among the politics core faculty. This adviser will be in addition to the faculty adviser from the student's home department. The politics adviser must serve on the student's qualifying examination committee and on the student's dissertation committee.
- 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.
- 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.

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## POLITICS FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**Michael K. Brown, Emeritus**

**J. Peter Euben, Emeritus**

**Kent Eaton**

Comparative politics, Latin America, international relations, political economy, public policy, political institutions

**Isebill V. Gruhn, Emerita**

**Bruce D. Larkin, Emeritus**

**Ronnie D. Lipschutz**

International relations; global political economy; globalization; foreign policy; resource/environmental politics; global political networks; global civil society and social movements; popular culture and politics; technology and society; risk society, state transformation and global governmentality

**Michael E. Urban, Emeritus**

**Daniel J. Wirls**

American politics, including national political institutions (Congress) and the President; public policy (military and foreign policy) and political history

### ASSOCIATE PROFESSOR

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**Elizabeth Beaumont**

Constitutionalism, democracy, and American political development; civic engagement and education; citizenship, rights, and problems of inequality; social movements and popular constitutionalism

**Eva C. Bertram**

American politics, public policy, political economy, and political history, including social policy and the welfare state, and the changing character of work and labor markets in the United States.

**Mark Fathi Massoud**

Law and society; human rights; international law and development, with a special interest in Sudan; field research, with an emphasis on qualitative and ethnographic methods

**Dean Mathiowetz**

Political theory; philosophies of language, agency, affect, and subjectivity; classical political economy

**Eleonora Pasotti**

Comparative urban politics, social movements, democratization, public policy, sub-national political economy and party politics

**Benjamin Read**

Comparative politics with special interest in the politics of China; theories of associations and social networks; communist and post-communist states; political participation and collective action

**Roger Schoenman**

Post-socialism, political economy, comparative capitalism, politics of pipelines, politics of memory, political networks, politics and money, Balkan and East European politics, Central Asian transition

**Vanita Seth**

Early modern and modern political theory, feminist theory, cultural history, race politics, postcolonial theory

**David J. Thomas, Emeritus**

**Megan Thomas**

Political theory, especially of the 19th century; nationalist thought; Orientalism; comparative colonialism; Southeast Asia

**George E. Von der Muhll, Emeritus**

### ASSISTANT PROFESSOR

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**Melanie Springer**

American politics, including voting and elections; electoral reform; federalism; state politics and policymaking; political institutions; partisanship and political history



### PROFESSOR

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**Edmund Burke III, Emeritus (History)**

**Barbara Epstein, Emerita (History of Consciousness)**

**Jonathan A. Fox (Latin American and Latino Studies)**

**Walter L. Goldfrank, Emeritus (Sociology)**

**David E. Goodman, Emeritus (Environmental Studies)**

**Paul M. Lubeck, Emeritus (Sociology)**

**Robert L. Meister (Professor, Professor of Political and Social Thought and History of Consciousness)**

**Hector Perla (Latin American and Latino Studies)**

**Daniel M. Press (Environmental Studies)**

**Craig Reinerman (Sociology)**

**Alan Richards, Emeritus (Environmental Studies)**

**Andrew Szasz (Environmental Studies)**

**David Wellman, Emeritus (Community Studies)**

**Donald A. Wittman (Economics)**

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## POLITICS COURSES

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### LOWER-DIVISION COURSES

#### **1. Politics: Power, Principle, Process, and Policy. F**

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. (Formerly Democratic Politics.) (General Education Code(s): PE-H, IS.) D. Wirls

#### **3. Keywords: Concepts in Politics. \***

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. (General Education Code(s): IS.) The Staff

#### **4. Citizenship and Action. S**

What does a citizen do? Uses political theory to answer this question as it relates to a number of issues, such as voting rights, diversity, gay marriage, and revolution. Draws on texts ranging from Aristotle to contemporary legal and cultural debates, to bear on the relationship of citizen action and identity. Other readings include Thoreau, Ellison, Rousseau, Marx, Arendt, and Socrates. (General Education Code(s): TA, IS.) D. Mathiowetz

#### **10. Nationalism. \***

Surveys contemporary academic approaches to the study of nationalism and writings of nationalist theorists from the 18th

through 20th centuries. A few historical cases are considered. (General Education Code(s): TA.) M. Thomas

#### **17. U.S. and the World Economy. \***

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. (General Education Code(s): IS.) R. Schoenman

#### **20. American Politics. \***

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. Satisfies American History and Institutions Requirement. (General Education Code(s): TA, IS.) E. Bertram

#### **60. Comparative Politics. W**

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. (General Education Code(s): CC, IS.) E. Pasotti

#### **65. Introduction to International Relations. \***

Surveys major theories of international relations including realism, liberal institutionalism, constructivism, and newer

approaches focused on problems of asymmetric warfare. Examines problems of nuclear proliferation, international terrorism, global trade conflict, climate change, and humanitarian intervention. (General Education Code(s): CC.) The Staff

#### **70. Global Politics. S**

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. (General Education Code(s): PE-H, IS.) The Staff

### Upper-Division Courses

#### **103. Feminist Interventions. S**

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. Enrollment restricted to politics, legal studies, and Latin American and Latino studies/politics combined majors during priority enrollment only. V. Seth

#### **105A. Ancient Political Thought. F**

Ancient political ideas in context of tension between democracy and empire, emergence of the psyche, and shift from oral to written culture. Emphasis on Athens, with Hebrew, Roman, and Christian departures and interventions. Includes Sophocles, Thucydides,

## Politics

Socrates, Plato, Aristotle, Stoics, the Bible, and Augustine. (Also offered as Legal Studies 105A. Students cannot receive credit for both courses.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. D. Mathiowetz

### **105B. Early Modern Political Thought. W**

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. (Also offered as Legal Studies 105B. Students cannot receive credit for both courses.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. V. Seth

### **105C. Modern Political Thought. \***

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. (Also offered as Legal Studies 105C. Students cannot receive credit for both courses.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. The Staff

### **106. Marxism as a Method. S**

Examines Marx's use of his sources in political philosophy and political economy to develop a method for analyzing the variable ways in which social change is experienced as a basis for social action. Provides a similar analysis of contemporary materials. Contrasts and compares Marxian critiques of these materials and readings based on Nietzsche, psychoanalysis, cultural studies, and rational choice materialism.

(Also offered as Legal Studies 106. Students cannot receive credit for both courses.) Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. The Staff

### **109. Orientalism. \***

Studies "Orientalism" as a concept of political theory and as a historical practice. Considers how "Western" views of the peoples, cultures, and governments of 'the East' influenced political, intellectual, and aesthetic projects of the 18th and 19th centuries, with attention to the themes of colonialism, nationalism, language, and gender. Also considers Orientalism as a subject of post-colonial thought. Prerequisite(s): course 105A, or 105B, or 105C, or 105D; or by permission of instructor. Enrollment restricted to politics majors. M. Thomas

### **110. Law and Social Issues. W**

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. (Also offered as Legal Studies 110. Students cannot receive credit for both courses.) Enrollment restricted to politics, legal studies, and Latin American and Latino studies/politics combined majors during priority enrollment only. The Staff

### **111A. Constitutional Law. S**

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. (Also offered as Legal Studies 111A. Students cannot receive credit for both courses.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. The Staff

### **112. Women and the Law. W**

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. (Also offered as Feminist Studies 112. Students cannot receive credit for both courses.) Enrollment restricted to politics, feminist studies, legal studies, and Latin American and Latino studies/politics combined majors during priority enrollment only. The Staff

### **113. Feminism and the Body. \***

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. Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. V. Seth

**114. Thinking Green: Politics, Philosophies, and Practices of Sustainability. \***

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. (Formerly Thinking Green: Politics, Ethics, Political Economy.) Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. R. Lipschutz

**115. Foundations of Political Economy. W**

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(s): course 105B, 105C, or 120C. Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. The Staff

**116. Comparative Law. \***

Explores legal systems and legal rules around the world, for a better understanding of the factors that have shaped both legal growth and legal change. Particular attention given to differences between common and civil law systems, changes brought about by the European Union, and expansion of

legal norms around the globe. (Also offered as Legal Studies 116. Students cannot receive credit for both courses.) Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. The Staff

**117. U.S. Telecommunications Law and Policy. \***

Surveys the U.S. telecommunications and broadcasting law and policy from the mid-19th century through the present. Offers a range of perspectives from the vantage point of the telecommunications industry, government, and the media-reform movement. Enrollment restricted to politics majors during priority enrollment only. The Staff

**118. Topics in Contemporary Political and Critical Theory. \***

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. Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. The Staff

**120A. Congress, President, and the Court in American Politics. W**

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. (Also offered as Legal Studies 120A.

Students cannot receive credit for both courses.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Satisfies American History and Institutions Requirement. D. Wirls

**120B. Society and Democracy in American Political Development. S**

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. (Also offered as Legal Studies 120B. Students cannot receive credit for both courses.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Satisfies American History and Institutions Requirement. M. Springer

**120C. State and Capitalism in American Political Development. \***

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. (Also offered as Legal Studies 120C. Students cannot receive credit for both courses.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Satisfies American History and Institutions Requirement. E. Bertram

## Politics

### **121. Black Politics and Federal Social Policy. \***

Examination of changes in the political and economic status of African Americans in the 20th century; particular focus on the role of national policies since 1933 and the significance of racism in 20th-century U.S. political development. (Also offered as Legal Studies 121. Students cannot receive credit for both courses.) Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. (General Education Code(s): E.) M. Brown

### **122. Politics, Labor, and Markets. \***

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. (Formerly Politics, Labor, and Markets in the U.S..) Enrollment restricted to politics and Latin American and Latino studies/politics combined major during priority enrollment. E. Bertram

### **124. Economic Inequality in America. \***

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. (Formerly Politics, Poverty, and Inequality in America.) Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. E. Bertram

### **125. Political Organizations in American Politics. S**

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. Pays particular attention to the role business and environmental groups play in American politics and policy. Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. The Staff

### **128. American Elections and Voting Behavior. F**

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. Enrollment restricted to politics majors and Latin American and Latino studies/politics combined majors during priority enrollment only. M. Springer

### **129. Policies and Politics of American Defense. F**

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. Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. D. Wirls

### **132. California Water Law and Policy. W**

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. (Also offered as Legal Studies 132. Students cannot receive credit for both courses.) R. Langridge

### **133. Law of Democracy. S**

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. (Also offered as Legal Studies 133. Students cannot receive credit for both courses.) Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. R. Coonerty

### **134. Congress: Representation and Legislation. \***

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

## Politics

the efficacy of Congress as a legislative body. Focuses on the contemporary Congress with comparisons to other legislative and representative institutions.

(Formerly Congress:

Representation and Legislation in Comparative Perspective.) (Also offered as Legal Studies 134.

Students cannot receive credit for both courses.) Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. D. Wirls

### **135. Immigration Policy and Debate in the U.S.. \***

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. Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. The Staff

### **139. Market Crisis and the Future of Capitalism. \***

Examines the development and role of late 20th- and early 21st-Century financial technologies in modern market crises. Overview of financial markets, modern finance theory, related regulatory institutions, financial crises, financial technologies, and the relation of human behavior. What is the future of market capitalism? Enrollment restricted to politics and politics/Latin American and Latino studies combined majors. The Staff

### **140A. Politics of Advanced Industrialized Societies. F**

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(s): satisfaction of the Entry Level Writing and Composition requirements. E. Pasotti

### **140C. Latin American Politics. S**

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(s): satisfaction of the Entry Level Writing and Composition requirements. (General Education Code(s): E.) K. Eaton

### **140D. Politics of East Asia. W**

Explores political and economic development in Northeast and Southeast Asia since WWII. Students apply theoretical and historical concepts to empirical case studies, building an understanding of how democracy and power operate. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. (General Education Code(s): E.) B. Read

### **141. Politics of China. \***

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 Tibet and Taiwan. Surveys current institutions, leaders, and policies. (Formerly China.)

Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. (General Education Code(s): E.) B. Read

### **142. Russian Politics. \***

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.

M. Urban

### **143. Comparative Post-Communist Politics. F**

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. (Formerly course 140B.)

Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. R. Schoenman

**144. Andean Politics. S**

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 course 140C, will be best prepared for this course. Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. K. Eaton

**145. Democratization, Citizenship, and Human Rights in Latin America. \***

Examines military regimes, transitions to civilian rule, and politics of democratization in contemporary Latin America. Focuses on the contradictions and legacies of transition politics, the challenges of democratizing political institutions, and the political and social consequences of neoliberalism. Emphasis on human rights, citizens' movements, changing dynamics of civil society, and contemporary efforts to deepen democracy. (Formerly course 150, Democratization, Citizenship, and Human Rights in South America) Enrollment restricted to politics and Latin American and Latino studies/politics combined majors. The Staff

**146. The Politics of Africa. \***

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. Enrollment restricted to politics majors during priority enrollment only. (General Education Code(s): E.) I. Gruhn

**148. Social Movements. W**

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. Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. The Staff

**149. Democratic Transitions. \***

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. Enrollment restricted to politics and Latin American and Latino studies/politics majors during priority enrollment only. E. Pasotti

**151. Politics of Law. F**

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. (Also offered as Legal Studies 151. Students cannot receive credit for both courses.) Enrollment restricted to politics, legal studies, and Latin American and Latino studies/politics combined majors during priority period. The Staff

**160A. Theories of International and World Politics. S**

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. (Formerly International Politics.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. L. Abdelaaty

**160B. International Law. W**

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. (Formerly course 173.) (Also offered as Legal Studies 160B. Students cannot receive credit for both courses.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. The Staff

**160C. Security, Conflict, Violence, War. F**

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

## Politics

objectives, and the end of hostilities. Civil and ethnic wars. Political economy of violence and war. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. The Staff

### **160D. International Political Economy. S**

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. (Formerly course 176.) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. R. Schoenman

### **161. Foreign Relations of China. F**

Surveys China's foreign policy from 1949 to today, including the Korean War; Sino-Soviet ties; relations with the United States; tension with Taiwan; and China's rise to geopolitical prominence. Introduces the major theoretical approaches to international relations. (Formerly course 143) Enrollment restricted to politics and politics/Latin American and Latino studies combined majors during priority enrollment. B. Read

### **163. U.S. Foreign Policy. S**

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. (Formerly How U.S. Foreign Policy Gets Made.) Enrollment restricted to politics and politics/Latin American and Latino studies combined majors. The Staff

### **164. International Politics of Forced Migration. \***

Surveys global issues in forced migration, the movement of people displaced by persecution, conflict, disasters, or development. Topics include historical trends, legal regimes, and ethical concerns. Explores the causes and consequences of forced displacement, and responses by state and non-state actors. Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. L. Abdelaaty

### **165. Global Organization. \***

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. (Formerly course 160B.) Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. The Staff

### **166. Politics of Migration. \***

Examines the magnitude and the political, economic, cultural, environmental, and social impact of today's movement of millions of people within and amongst states. Enrollment restricted to politics majors and Latin American and Latino studies/politics combined majors during priority enrollment. (General Education Code(s): CC.) I. Gruhn

### **167. Politics of International Trade. \***

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. (Also offered as Legal Studies 167. Students cannot receive credit for both courses.) Enrollment restricted to politics, and Latin American and Latino studies/politics combined majors during priority enrollment only. The Staff

### **168. Topics in International Relations and Global Politics. W**

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. Prior enrollment in course 160A is recommended, but not required. Enrollment is restricted to politics majors during priority enrollment. The Staff

### **169. Politics of Development. S**

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. Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. R. Schoenman

### **171. Law of War. \***

Examines legal regulation of international violent conflict. Students examine development of normative standards within international law and creation of institutions to both adjudicate violations and regulate conduct. (Also offered as Legal Studies 171.)

## Politics

Students cannot receive credit for both courses.) Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. The Staff

### **172. Liberalism, the State, and the War on Terror. \***

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. Enrollment restricted to politics and politics/Latin American and Latino studies majors during priority enrollment. The Staff

### **174. Political Economy of Global Energy, Environment, and Resources. S**

Focus on global environmental "problematique" and how it is being played out in a variety of political economic, and social arenas. Includes technical overview of environmental movements, green economics, energy and resource issues, and sustainable approaches. (Formerly Global Environment Politics) Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. R. Lipschutz

### **175. Human Rights. S**

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. (Also offered as

Legal Studies 175. Students cannot receive credit for both courses.) Prerequisite(s): Politics or Legal Studies 160B. Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment. The Staff

### **177. The United States and the World. \***

Examines political, economic, and cultural relationship between the U.S. and the rest of the world, including historical background and foreign policy. Special focus on U.S. involvement in the Middle East and Persian Gulf and the politics of economics of that region. Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. R. Lipschutz

### **178. U.S. Foreign Economic Policy. F**

Theoretical and historical survey of U.S. foreign economic policy. First part explores theoretical frameworks and covers historical events in the U.S.'s relationship with world economy. The second part focuses on postwar foreign economic policy; surveys different theoretical approaches to U.S. foreign policy; and examines fundamental developments and issues in trade, monetary, development, and investment policies. Enrollment restricted to politics and Latin American and Latino studies/politics combined majors during priority enrollment only. The Staff

### **185. Political Psychology. W**

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. Enrollment restricted to politics and combined politics and Latin America and Latino studies majors during priority enrollment only. The Staff

### **190. Senior Comprehensive Seminar.**

These courses, offered at different times by different instructors, focus on current problems of interest across the discipline. Courses offer a flexible framework within which those mutually interested in specific issues can read, present papers, and develop their ideas. Students who do not meet the restrictions and prerequisites may contact the instructor for permission to enroll. The Staff

### **190A. State and Revolution. \***

Investigates the process of rapid and fundamental political change from the standpoint of both the structures of states in which revolutions have occurred and the structures of states issuing from revolutions. A number of cases are examined, but particular emphasis is given to the "classic" revolutions in France (1789) and Russia (1917). Enrollment restricted to senior politics and Latin American and Latino studies/politics combined majors; major restrictions lifted during open enrollment. Enrollment limited to 20. M. Urban

### **190B. Humanity, Sovereignty, and War. F**

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

## Politics

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(s): two of the following: course 103, 105A, 105B, 105C, 105D, 107, 109, or 115. Enrollment restricted to senior politics and Latin American and Latino studies/politics combined majors during priority enrollment only. Enrollment limited to 20. D. Mathiowetz

### **190C. Humanitarian Action in World Politics. \***

Examines the global politics of humanitarianism. Topics include the historical evolution of humanitarian principles, key actors in the humanitarian sector, and institutional arrangements. Explores the ethical and practical challenges associated with humanitarian relief, aid, and intervention. Enrollment restricted to senior politics and politics/Latin American and Latino studies combined majors. Enrollment limited to 20. The Staff

### **190D. Early Anarchist and Socialist Thought. \***

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(s): two of the following: courses 103, 105A, 105B, 105C, 105D, 109, or 115; or by permission of instructor. Enrollment restricted to senior politics majors. Enrollment limited to 20. M. Thomas

### **190E. Transitions in the Information Age. \***

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. Enrollment restricted to senior politics and Latin American and Latino studies/politics combined majors. Enrollment limited to 20. R. Schoenman

### **190G. Issues in International Law. \***

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. Enrollment restricted to senior legal studies, politics, and Latin American and Latino studies/politics combined majors during priority enrollment only; major restrictions will be lifted during open enrollment. Enrollment limited to 20. The Staff

### **190H. The Substance of Democracy. W**

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. Enrollment restricted to senior politics and combined politics/Latin American and Latino studies majors. Enrollment limited to 20. E. Pasotti

### **190I. Political Ecology and Ecological Politics. \***

Examines a range of ecological philosophies and their implications for politics, economics, social action,

and the Earth. Themes addressed in relation to political ecology include: liberalism, historical materialism, the nature/culture divide, justice, feminism, and critical theory. Enrollment restricted to senior politics and Latin American and Latino studies/politics combined majors during priority enrollment only. R. Lipschutz

### **190J. Politics and Inequality. S**

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. Enrollment restricted to senior politics and Latin American and Latino studies/politics combined majors during priority enrollment only. Enrollment limited to 20. The Staff

### **190K. China in the World Trade Organization. \***

Examines the impact that the World Trade Organization (WTO) has had on China's economic reform, lawmaking, and political and social development. Also examines how China has used the WTO to safeguard its interests through the dispute-settlement mechanism and the Doha trade talks. Enrollment restricted to senior politics and Latin American and Latino studies/politics combined majors during priority enrollment only. Enrollment limited to 20. The Staff

### **190L. Poverty Politics. \***

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

## Politics

dilemmas of race and urban poverty, gender and family poverty, work, and the politics of welfare reform. Enrollment restricted to senior politics and Latin American and Latino studies/politics combined majors during priority enrollment only. Enrollment limited to 20. E. Bertram

### **190M. Politics in American States. F**

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. Enrollment restricted to senior politics and combined politics/Latin American and Latino studies majors. Enrollment limited to 20. M. Springer

### **190P. Race: History of a Concept. S**

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. Enrollment restricted to senior politics and Latin American and Latino studies/politics combined majors during priority enrollment. Enrollment limited to 20. V. Seth

### **190Q. Theorizing Modernity. \***

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(s): any two of the following courses: 105A, 105B, 105C, 105D. Enrollment restricted to senior politics and Latin American and Latino studies/politics combined majors during priority enrollment. Enrollment limited to 20. V. Seth

### **190R. Comparative Law and Society. \***

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. (Also offered as Legal Studies 190R. Students cannot receive credit for both courses.) Prerequisite(s): course 160B. Enrollment restricted to senior politics and Latin American and Latino studies/politics combined majors. Enrollment limited to 20. M. Massoud

### **190S. Empire and After. \***

Examines the literature on American empire, beginning with the founding parents (e.g., Jefferson), continuing through the revisionist literatures (e.g., Williams) and more recent work (e.g., Hardt and Negri), and ending with contemporary critiques and predictions. Enrollment restricted to senior politics majors. Enrollment limited to 20. The Staff

### **190T. Governance and Conflict in East Asia. \***

Students read recent books on East Asian countries that engage the long-standing themes of state power and societal resistance. Prerequisite(s): course 141 or 161 or 109, or by permission of instructor. Enrollment restricted to

senior politics majors. Enrollment limited to 20. B. Read

### **190V. Problems in Latin American Politics. W**

Research seminar allows advanced students to engage in current scholarly debates in the sub-field of Latin American politics. Students are encouraged to pick a research topic of their own choosing. Recent course themes have included obstacles to democratic consolidation; crime and insecurity; economic reform; lesbian, gay, bisexual, and transgender (LGBT) politics; and public-policy innovations. Prerequisite(s): course 140C or 144. Enrollment restricted to senior politics and Latin American and Latino studies/politics combined majors during priority enrollment only. Students with equivalent coursework may enroll with permission of instructor. Enrollment limited to 20. K. Eaton

### **190X. Global Capitalism and War. \***

Examines the history and organization of, and relationships among, global capitalism and war, through political economy, with a focus on major historical works and recent writings, especially in relation to the crisis of globalization and the rise of the global economy. (Formerly Global Capital and Capitalism.) Prerequisite(s): One of course 115, 120C, 160A, 160D, or 178. Enrollment restricted to senior politics and Latin American and Latino studies/politics combined majors during priority enrollment only. Enrollment limited to 20. The Staff

### **190Y. Political Theories of Luxury. \***

Examines conceptions of luxury as they have appeared in classical, Christian, early modern, and

## Politics

contemporary discourses and debates. How have people sought to define luxury; for what political purposes; and what promise and peril do such definitions have? What is the shape and power of luxury in political communities today? (Formerly Political Theory of Luxury.) Prerequisite(s): One of the following courses: 103, 105A, 105B, 150C, 106, 109, 113, 115, 118, 124. Enrollment restricted to senior politics and politics/Latin American studies majors. Enrollment limited to 20. D. Mathiowetz

**190Z. International Security. W**  
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. Enrollment restricted to senior politics and Latin American and Latino studies/politics combined majors. Enrollment limited to 20. The Staff

**193. Field Study in Politics. F,W,S**  
Individual studies undertaken off campus with direct faculty supervision. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**194. Group Tutorial. F,W,S**  
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. May be repeated for credit. The Staff

**194F. Group Tutorial (2 credits). F,W,S**  
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. May be repeated for credit. The Staff

**195A. Senior Thesis. F,W,S**  
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. The Staff

**195B. Senior Thesis. F,W,S**  
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. The Staff

**195C. Senior Thesis. F,W,S**  
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. The Staff

**198. Independent Field Study. F,W,S**  
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. May be repeated for credit. The Staff

**198F. Independent Field Study (2 credits). F,W,S**  
Individual studies undertaken off-campus for which faculty supervision is not in person, but by correspondence. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199. Tutorial. F,W,S**  
A student normally approaches a member of the staff and proposes to take a course 199 on a subject he or she has chosen which is not offered in other politics courses. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S**  
A student normally approaches a member of the faculty and proposes to take a course 199 on a subject he or she has chosen which is not offered in other politics courses. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## GRADUATE COURSES

**200A. Political and Social Thought Core Seminar. \***  
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. (Formerly Interpretive Problems in Political Theory: Language and Power.) Enrollment restricted to graduate students. Enrollment limited to 15. V. Seth

**200B. Social Forces and Political Change Core Seminar. \***  
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

## Politics

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. Enrollment restricted to graduate students. Enrollment limited to 15. E. Pasotti

### **200C. States and Political Institutions Core Seminar. F**

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. Enrollment restricted to graduate students. Enrollment limited to 15. R. Schoenman

### **200D. Political Economy Core Seminar. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. K. Eaton

### **201. Logics of Inquiry. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. R. Lipschutz

### **202. Fundamentals of Political Research. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. M. Massoud

### **203. Making of the Modern. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. V. Seth

### **204. Bodies in History. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. V. Seth

### **206. Topics in Political Theology. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. B. Meister

### **207. Political Economies of Affect. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. D. Mathiowetz

### **208. Race. \***

Considers the subject of race and racism from a political and historical perspective appealing to literatures from history, anthropology, science, and literary studies. Enrollment restricted to graduate students. Enrollment limited to 15. V. Seth

### **209. Radical Political Thought. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. M. Thomas

### **212. Democratic Agency: Embodiment, Language, Precarity. W**

Explores agency in contexts marked by co-action and conflict, interrogating agency's historical

## Politics

dimensions (conceptual and intrinsic), attribution to collective or ecosystemic actors, affective aspects, and relation to democracy and economy. Explores classic texts in political thought, as well as Taylor, Foucault, Butler, and Ranciere. Enrollment is restricted to graduate students. Enrollment limited to 15. D. Mathiowetz

### **222. Conflict and Change in American Politics and Policy. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. D. Wirls

### **232. United States Political History. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. D. Wirls

### **233. Interrogating Race. \***

Critically examines alternative theoretical and methodological approaches to study of race and racism. Considers alternative explanations for origins and

persistence of racism and racial inequality and suggests the relevance of a socio-political understanding. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

### **243. Comparative Methods. W**

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. (Also offered as Latin American&Latino Studies 243. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. Enrollment limited to 15. K. Eaton

### **245. Latin American Politics. \***

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). Enrollment restricted to graduate students. Enrollment limited to 15. K. Eaton

### **247. Comparative Urban Politics. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. E. Pasotti

### **249. Politics of Protest. F**

Explores topics related to protest and political participation from theoretical and empirical perspectives. Enrollment restricted to graduate students. Enrollment limited to 15. E. Pasotti

### **255. Comparative Anti-Colonialisms. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. M. Thomas

### **261. Key Issues in Contemporary Chinese Politics. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. B. Read

### **265. Nationalism. \***

Survey of theories of nationalism, with selected nationalist thinkers and case studies. Emphasis on historical analyses and cases. Topics include: origins and typologies of nationalisms, racism, gender, revolution, and the state. Enrollment restricted to graduate students. Enrollment limited to 15. M. Thomas

**272. Critical Interventions in IR Theory and Global Political Economy. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. R. Lipschutz

**275. Contemporary Capitalism. \***

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. (Formerly New Approaches to the Study of Capitalism.) Enrollment restricted to graduate students. Enrollment limited to 15. R. Schoenman

**291. Teaching Assistant Seminar (2 credits). \***

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. May be repeated for credit. The Staff

**292. Professional Development (2 credits). \***

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. Enrollment restricted to graduate students. Enrollment limited to 20. D. Mathiowetz

**293. Field Study. F,W,S**

Individual study undertaken off campus with direct faculty supervision. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**295A. Research Colloquium (2 credits). \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. May be repeated for credit. The

Staff

**295B. Advanced Research Seminar. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. May be repeated for credit. The Staff

**297. Independent Study. F,W,S**

A student approaches a member of the staff and proposes to take a course 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. May be repeated for credit. The Staff

**299. Thesis Research. F,W,S**

Enrollment restricted to graduate students and permission of instructor. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# PORTER COLLEGE

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2015-16 General Catalog

College Office  
(831) 459-2071

<http://porter.ucsc.edu/>

For college description and list of faculty, see Colleges.

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## PORTER COLLEGE COURSES

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### LOWER-DIVISION COURSES

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#### **12. The ArtsBridge Experience (2 credits). \***

Weekly meetings on pedagogy in the arts, lesson planning for arts teaching in schools, and submission of teaching portfolio core of this class. Prerequisite(s): permission of instructor; student must be an ArtsBridge scholar. May be repeated for credit. M. Foley

#### **13C. Service Learning: Introduction to National Service/Introduction to Grant Writing (3 credits). W**

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. (Also offered as Kresge College 12C. Students cannot receive credit for both courses.)

Enrollment restricted to college members. (General Education Code(s): PR-S.) F. Williams

#### **14. Jazz Vocal Ensemble (2 credits). \***

Study of vocal techniques in the context of ensemble rehearsals, often culminating in public performance. Familiarity with musical notation recommended. Admission by audition. May be repeated for credit. (General Education Code(s): A.) The Staff

#### **19. Chicana/Latina Identity (2 credits). \***

An exploration of Chicana/Latina identity within the context of developmental theories and heterogenous cultural influences on identity formation, including the acculturation process. Students explore their own identities within the previously stated context. Enrollment limited to 20. The Staff

#### **20. Dance/Theater Practicum.**

The practice of dance/theater in a particular world area (i.e., Philippines, Mexico, U.S.). Students learn the dance or theater art of one world area and study the associated cultural background.

#### **20A. Filipino Dance Practicum (2 credits). \***

Students are introduced to the different folk dances of the Philippine Islands. Folk dances of the tribal mountain region, of the Spanish Era in the Philippines

(Maria Clara Era), and dances of the regional and rural countryside are emphasized. Enrollment limited to 25. May be repeated for credit. (General Education Code(s): A.) The Staff

#### **20C. Korean Dance Practicum (2 credits). \***

Students are introduced to the different dances of Korea related to folk tradition. Movement concepts of music and the relation to culture are explored through demonstration, practice, and performance. Enrollment limited to 15. Offered in alternate academic years. (General Education Code(s): A.) The Staff

#### **20D. Dance Improvisation (2 credits). \***

Dance practicum emphasizing spontaneous movement in response to diverse media including visual art and music. Special emphasis given to the conceptual approaches taken by American artists such as Merce Cunningham, John Cage, and Robert Rauschenberg. Enrollment limited to 25. (General Education Code(s): A.) The Staff

#### **20F. Solo Performance Works in the Theater (2 credits). \***

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. Enrollment restricted to college members.

Enrollment limited to 24. (General Education Code(s): PR-C.) R. Giges

### **21. Music Practicum.**

#### **21A. Korean Music and Culture (2 credits). \***

Introduction to the farmers band tradition. Theory and practice of drumming are emphasized, resulting in a group performance. Enrollment limited to 20. Offered in alternate academic years. (General Education Code(s): A.) The Staff

#### **21C. Gospel Choir (2 credits). W,S**

Instruction in vocal performance in the tradition of gospel choirs. Music is transmitted aurally rather than by notation. The ensemble prepares a range of traditional and contemporary gospel music for performance. Ensemble performs publicly at least once each quarter. Enrollment limited to 60. May be repeated for credit. (General Education Code(s): PR-C, A.) V. Fiddmont

#### **22. Art Practicum (2 credits). \***

The practice of art in a particular world area (i.e., Japan, Pacific Islands, U.S.). Explores the art and craft of one world area and studies the associated cultural background. Enrollment restricted to college members. Enrollment limited to 15. (General Education Code(s): A.) The Staff

#### **22A. Day of the Dead (2 credits). \***

Day of the Dead: Creating an Exhibition--an exploration of art created to celebrate death in Mexican, Chicano, and American culture. Culminates in the creation of a Day of the Dead ceremony and community altar including students' individual art pieces. Enrollment restricted to college members. Enrollment limited to 25. (General

Education Code(s): PR-E, A.) The Staff

#### **22C. Handmade Books (2 credits). W,S**

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. Enrollment restricted to college members or by permission of the instructor. Enrollment limited to 15. (General Education Code(s): PR-C, A.) The Staff

#### **22F. Vietnamese Festivals (2 credits). \***

Vietnamese festivals and the arts they generate, from carving to water puppetry, will be explored for cultural, aesthetic, and iconographic principles, through viewing, discussion and a creative project. Enrollment limited to 20. (General Education Code(s): A.) The Staff

#### **22G. Literary Magazine Publishing (3 credits). \***

Learn about and practice basics in publishing a national literary magazine with focus on poetry and the arts. Three-part focus: soliciting/editing, design/publishing, and publicizing/distributing. Students decide which poems published and awarded prizes in the "Viz. 25 and Under Awards" section. Audition for admission at first class with demonstrated experience in related field: creative writing, desk top publishing, art, graphic design, business, etc. Enrollment limited to 20. May be repeated for credit. (General Education Code(s): A.) R. Hamilton

#### **22H. Playwriting Workshop (2 credits). S**

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. Enrollment is restricted to Porter College members.

(General Education Code(s): PR-C.) K. Hawley

#### **23. Film/Theater Practicum.**

The practice of film/theater from the perspective of a particular culture, genre, or technical approach.

#### **23A. Film Practicum: Talking in Pictures (2 credits). \***

Introductory survey of the language of film and television. Considers the roles these media play in the shaping of cultural identity. Creative projects in the conceptual preparation for the making of films and videos. Enrollment limited to 25. (General Education Code(s): A.) The Staff

#### **23B. Personal Narratives in Theater and Film (2 credits). S**

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. Priority given to college members. Others by permission of instructor. Enrollment limited to 25. (General Education Code(s): PR-C, A.) R. Giges

#### **23C. Documentary/Mockumentary Films (2 credits). \***

The mockumentary grows out of the documentary tradition, but instead of pretending to truthfully capture reality, it blatantly distorts, revealing the subjectivity inherent in cinematic representation. Includes ethnographic, music, political and Hollywood mockumentaries, and critical readings on documentary film. Priority given to Porter College

members. Others by permission of instructor. Enrollment limited to 25. (General Education Code(s): A.) R. Giges

**26. Navigating the Research University (2 credits). F**

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 Kresge 26 or Stevenson 26. Enrollment is restricted to first-year Porter and Kresge College members. The Staff

**28. Sound Art (2 credits). W,S**

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. Enrollment restricted to college members. Enrollment limited to 18. (General Education Code(s): A.) The Staff

**32A. Queering the Arts (2 credits). S**

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. Enrollment restricted to college members. Enrollment limited to 30. (General Education Code(s): A.) R. Hamilton

**32B. The Artist's Novel (2 credits). \***

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. Enrollment restricted to college members or by permission of instructor. L. Martin

**33. Seminar in Arts (2 credits). F,W,S**

Theoretical and historical aspects of the arts from one culture or world area are explored through seminar discussion, library research, and film/video presentations. Priority given to college members. Others by permission of instructor. Enrollment limited to 20. May be repeated for credit. (General Education Code(s): A.) The Staff

**33A. African Global Art and Music (2 credits). \***

The theme of "Changing the Global Community Through the Arts" explored in African global art and music through readings, listening sessions, and interactions with academics and performers. Culmination will be the African Global Festival and Symposium in April. Enrollment limited to 25. (General Education Code(s): A.) E. Cameron

**34B. Fractals, Chaos Theory, and the Arts (2 credits). S**

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. Enrollment restricted to college members. Enrollment limited to 25. (General Education Code(s): PR-C, A.) R. Abraham

**35. Experiencing Live Performance (2 credits). \***

Students' attendance at live regional theater performances

informed by artists' talks, class lectures, and readings. Students participate in informal performance workshops and write short critical essays. Enrollment limited to 30. May be repeated for credit. (General Education Code(s): A.) The Staff

**38. Working in . . . Series.**

Writers, directors, technical workers, visual artists, and professionals in a diverse range of media discuss current work, paths that led to their creative endeavors, and constraints to working in the industry.

**38B. Working in TV and Film (2 credits). \***

Writers, directors, and technical workers in areas of TV and film discuss current work, paths that led to their creative endeavors, and constraints of working in the industry. Students research aspects of film and TV professional work. Cannot be repeated for credit. Priority given to college members. Others by permission of instructor. (General Education Code(s): A.) The Staff

**38C. Introduction to Laser Cutting, 3D Printing, and Vacuum Forming (2 credits). \***

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. Enrollment restricted to Porter College members. Enrollment limited to 25. The Staff

**39. Jewish Personal Narratives on Film (2 credits). \***

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. Enrollment restricted to college members. Enrollment limited to 25. (General Education Code(s): PR-C, A.) R. Giges

**80A. Introduction to University Discourse: Composition, Creative Inquiry, and the Arts. F** Explores rhetorical principles and conventions of university discourse, providing intensive practice in analytical writing, critical reading, and speaking. Study, discuss, and write about social, political, and aesthetic issues raised by selected works of literature and art in a variety of media. Students cannot receive credit for this course and course 80B. (Formerly Introduction to University Discourse: Writing Across the Arts.) Enrollment restricted to first-year college members who have not satisfied the C1 requirement. Enrollment limited to 25. (General Education Code(s): T4-Humanities and Arts, C1.) The Staff

**80B. Rhetoric and Inquiry: Composition, Creative Inquiry, and the Arts. F** Explores the intersections between rhetoric (persuasion) and inquiry (investigation) and hones strategies for effective reading, writing, speaking, and research. Read, discuss, research, and write about social, political, and aesthetic issues raised by selected works of literature and art in a variety of media. Students cannot receive credit for this course and course 80A. (Formerly Rhetoric and Inquiry: Writing Across the Arts.) Prerequisite(s): satisfaction of the Entry Level Writing and C1 requirements. Enrollment restricted to first-year college members. (General Education Code(s): T4-Humanities and Arts, C2.) The Staff

**80E. Arts Education in the Community. W** 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. Priority given to college members. Others by permission of instructor. Enrollment limited to 30. (General Education Code(s): T4-Humanities and Arts, A.) T. Beal

**80F. Composition, Creative Inquiry, and the Arts (2 credits).** Focuses on reading comprehension, the creation of a vocabulary of shared texts and concerns, and activities that are intended to build community across the freshman cohort at Porter College. Enrollment is restricted to Porter students who have been placed in the Multilingual Curriculum. (General Education Code(s): PR-C.) P. College

**80G. Making Poetry: Readings/Writing (2 credits). \*** Guest poets read work and discuss their approaches to writing. Students develop their own poems and the class culminates in a poetry reading of student work. Priority given to Porter College members. Others by permission of instructor. Enrollment limited to 25. (General Education Code(s): A.) The Staff

**80I. Improvisation. W** 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.

Enrollment limited to 25. (General Education Code(s): PR-C, T4-Humanities and Arts, A.) R. Giges

**80K. Ways of Knowing. \*** 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. Enrollment restricted to college members. (General Education Code(s): T6-Natural Sciences or Humanities and Arts.) The Staff

**80L. Documenting Oral History. \*** 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. Priority given to college members. Others by permission of instructor. Enrollment limited to 30. (General Education Code(s): T5-Humanities and Arts or Social Sciences, A.) T. Beal

**80W. Writing Across the Arts. \*** Explores the intersections between rhetoric (persuasion) and inquiry (investigation) and hones strategies for effective reading, writing, speaking, and research. Students read, discuss, research, and write about social, political, and aesthetic issues raised by selected works of literature and art in a variety of media. Prerequisite(s): satisfaction of the Entry Level Writing Requirement, and C1 and C2 requirements. Enrollment restricted to college members. Enrollment limited to 22. (General Education Code(s): T4-Humanities and Arts, W.) The Staff

**83. Pacific Rim Film Festival: Viewing Across Cultures (2 credits). \***

Involves viewing Asian and Pacific films at the annual Pacific Rim Film Festival, participating in post-screening discussions with area experts, and writing on the issues of cross-cultural viewing/reading of film. Enrollment restricted to college members. Enrollment limited to 20. May be repeated for credit. (General Education Code(s): PR-S, A.) M. Foley

**90A. Aesthetics and Politics: Spanish Civil War. S**

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. Enrollment limited to 25. (General Education Code(s): PR-C.) D. Lau

**91F. Challenge Speakers Colloquium (2 credits). F**

Eight lectures, six by faculty about research problems in their disciplines. Students attend two dinners with the speakers; respond to research papers in each speaker's field; conduct a research interview with a professor; and investigate a research question. (Also offered as Kresge College 91F. Students cannot receive credit for both courses.) Prerequisite(s): course 90A, or Merrill 90, or Kresge 90A, or Stevenson 90. Enrollment restricted to college members. The Staff

**99. Tutorial.**

Various topics to be arranged. Students submit petition to sponsoring agency. The Staff

**99F. Tutorial (2 credits).**

Various topics to be arranged. Students submit petition to sponsoring agency. The Staff

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**UPPER-DIVISION COURSES**

**100. Curatorial Practice (2 credits). W**

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. Enrollment is restricted to Porter College members. (General Education Code(s): PR-E.) S. Graham

**120. Advanced Dance/Theater Practicum (2 credits). \***

The practice of dance/theater in a particular world area or culture. Students learn the art of one world area or era and the associated cultural background. Prerequisite(s): audition; prior training in the discipline is required. Enrollment limited to 15. May be repeated for credit. (General Education Code(s): A.) The Staff

**121. Advanced Music Practicum (2 credits). \***

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. May be repeated for credit. (General Education Code(s): A.) The Staff

**121C. Opera Workshop/Music Practicum (2 credits). \***

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. Enrollment limited to 25. May be repeated for credit. (General Education Code(s): A.) N. Paiement

**126. South Asia Seminar (2 credits). \***

South Asian issues in arts, technology, culture, and history will be presented in weekly seminar. Students will attend lectures, read supplementary articles, and write a short paper on a South Asian topic. Enrollment limited to 15. M. Foley

**141. New Works Research Laboratory. \***

Artists from different disciplines (i.e., art and music, design and creative writing, performance art and dance, etc.) collaborate with students to research and create new pieces. Students are involved in phases of the development from the conception to presentation of the work. Enrollment limited to 20. May be repeated for credit. The Staff

**194. Group Tutorial.**

A program of independent study arranged between a group of students and a faculty instructor. The Staff

**199F. Tutorial (2 credits).**

Individual projects carried out under the supervision of a Porter faculty member. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# PORTUGUESE

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2015-16 General Catalog

Department of Languages and Applied Linguistics

218 Cowell College

(831) 459-2054

<http://language.ucsc.edu>

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## PROGRAM DESCRIPTION

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Students interested in acquiring proficiency in Portuguese may choose to enroll in either of two accelerated introductory tracks: courses 1A–B are designed as a two-quarter sequence for students who have no previous experience with the Romance languages; courses 60A–B comprise a two-quarter sequence designed for students who have a strong background in the Romance languages (typically Spanish) or some previous rudimentary knowledge of Portuguese. Both tracks are accelerated. A second-year Portuguese sequence, also accelerated (courses 65A–B), 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.

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### CAMPUS LANGUAGE LABORATORIES AND PLACEMENT EXAMS

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Information about these topics can be found under [Department of Languages and Applied Linguistics](#).

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### STUDY ABROAD

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Students may apply to spend time either in Rio de Janeiro, Brazil or in Salvador (Bahia) through the Office of International Education (OIE). Courses taken abroad can, with approval of an adviser, be applied to major requirements. For a list of current programs and requirements, visit their web site, <http://oie.ucsc.edu>. For information on credit applied to a major, contact the appropriate department.

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## PORTUGUESE FACULTY AND PROFESSIONAL INTERESTS

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### LECTURER

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**Ana Maria C. Seara**

Portuguese language; literature, film, and music of

Brazil and the Portuguese-speaking world; acquisition and teaching of foreign, second, and heritage languages

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## PORTUGUESE COURSES

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### LOWER-DIVISION COURSES

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#### **1A. Accelerated Portuguese. F**

This course is the first quarter of an accelerated two-quarter series (1A–B), which, taken together, are equivalent to first-year instruction. This intensive class requires no background in the Romance languages, and emphasizes all language skills, including cultural competence. (Formerly Intensive Elementary Portuguese.) The Staff

#### **1B. Accelerated Portuguese. W**

This course is sequential to course 1A, and completes first-year accelerated instruction. This intensive class is designed for students with no background in the Romance languages, and emphasizes all language skills, including cultural competence. (Formerly Intensive Elementary Portuguese.) Prerequisite(s): course 1A, or by consent of instructor. The Staff

#### **60A. Accelerated Portuguese for Speakers of Romance Languages. F**

The first quarter of accelerated first-year instruction (60A–B). Designed for students with four quarters of college-level Spanish, French, Italian, or Catalan, and native speakers of these Romance languages (including heritage speakers of Portuguese). Emphasizes all language skills, including cultural competence. (Formerly Advanced Beginning and

## Portuguese

Intermediate Portuguese.)

Prerequisite(s): Spanish 4 or Spanish for Heritage Speakers 4 or Spanish for Spanish Speakers 61 or French 4 or Italian 4 or Spanish Placement Examination score of 50 or by consent of instructor. The Staff

### **60B. Accelerated Portuguese for Speakers of Romance Languages. W**

The second quarter of the 60A-B series completes first-year accelerated instruction of Portuguese for speakers of Spanish, French, Italian, or Catalan, and native speakers of these Romance languages (including heritage speakers of Portuguese).

Emphasizes all language skills, including cultural competence. (Formerly Advanced Beginning and Intermediate Portuguese.)

Prerequisite(s): course 60A, or by consent of instructor. (General Education Code(s): IH.) The Staff

### **65A. Accelerated Intermediate Portuguese. S**

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.

(Formerly Intermediate Portuguese.) Prerequisite(s): course 1B or 60B, or by consent of instructor. (General Education Code(s): CC, IH.) The Staff

### **65B. Accelerated Intermediate Portuguese. F**

Sequential to course 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. (Formerly Intermediate Portuguese.) Prerequisite(s): course 65A, or by consent of instructor. (General Education Code(s): CC, IH.) The Staff

### **99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. The Staff

### **99F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. The Staff

### **Upper-Division Courses**

#### **199. Tutorial. F,W,S**

Students submit petition to sponsoring agency. The Staff

#### **199F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. The Staff

Revised: 09/01/15

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# PSYCHOLOGY

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2015-16 General Catalog  
273 Social Sciences 2 Building  
(831) 459-2002  
<http://psychology.ucsc.edu>

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## PROGRAM DESCRIPTION

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Psychology majors at UCSC 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. Majors take a total of eight upper-division courses. These include Psychology 100, Research Methods in Psychology; six courses in the four areas of psychology—developmental, cognitive, social, and clinical-personality psychology; and one upper-division course outside the major from an approved list. Cognitive psychology focuses on topics such as perception; brain and behavior; motor control; learning and memory; thinking, feeling, and emotions; psycholinguistics; and computational modeling. Our cognitive psychologists extend traditional boundaries in the study of cognition to encompass bodies, physical environments, sociocultural contexts, and information technologies. Social psychology addresses topics such as persuasion and influence, motivation, group processes, intergroup relations, psychology and law, and 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 ethnicity, culture, gender, income, and family structure. Clinical-personality psychology focuses on person-centered processes including attachment, life stories, and adjustment.

In addition to the general psychology major, an intensive major (described below) is also available. The department also administers a major in cognitive science (see separate listing in this catalog under cognitive science). 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. UCSC does not offer advanced degrees in clinical or counseling psychology. Students are encouraged to carry out research projects. Interested psychology majors will find research opportunities in courses, as research assistants in

faculty members' research programs, or through faculty-sponsored independent study. This research may be carried out in specialized research laboratories or in the field. Students usually join an ongoing project in which a faculty member is engaged. Students who are especially interested in a career involving empirical research should become involved in a professor's ongoing research by their junior year. Some recent research topics include "Learning in Infancy," "Parent-Child Conversations," "Reading Aloud," "Learning About Psychology Through Conversation," "Complexities of Privilege," and "Program Evaluation of a Biophysics Course."

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## PROGRAM LEARNING OUTCOMES

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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.

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## PREPARATION FOR THE MAJOR

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Students interested in pursuing the psychology major should complete Psychology 1, 2, and the precalculus mathematics requirement. Psychology 1 and 2 should be taken for a letter grade. After completing these three lower-division required courses, students may petition

## Psychology

to declare the psychology major subject to the grade requirement 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, mathematics at least through precalculus, biological and physical sciences, and social sciences.

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### TRANSFER STUDENTS

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Junior transfer students should express an interest in psychology on their UCSC application for admission.

It is expected that prospective transfer students will have completed most, if not all, of the lower-division requirements. The lower-division requirements include Psychology 1, 2, 10, and AMS 3 or 6 (or equivalent). The psychology faculty recommends that all lower-division requirements be completed by the end of the sophomore year. In order to declare the major, transfer students must meet the grade requirement described in the Qualification to the Major section below.

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 adviser. Psychology 100, Research Methods in Psychology, must be taken at UCSC. Students planning to transfer to UCSC should check with the advising office of their present college, or refer to [www.assist.org](http://www.assist.org).

Transfer students are strongly encouraged to speak with an academic adviser at the Psychology Department office prior to enrolling in classes in order to determine their status and begin the actual declaration of major process.

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### GENERAL PSYCHOLOGY MAJOR

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Twelve courses are required for the general major: four lower-division courses in preparation for the major and eight upper-division courses. The lower-division courses are prerequisites for virtually all of the upper-division courses and should be completed as early as possible, or by the end of the sophomore year. Some upper-division courses have additional prerequisites.

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### LOWER-DIVISION REQUIREMENTS

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#### Psychology

- 1 Introduction to Psychology (or equivalent)
- 2 Introduction to Psychological Statistics (or equivalent, including Applied Mathematics and Statistics 5 or 7/L)
- 10 Introduction to Developmental Psychology

Applied Mathematics and Statistics 3 or 6, or Mathematics 3 or 4 or 11A (or equivalent)

Psychology 20, 40, and 60 are strongly recommended.

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### UPPER-DIVISION REQUIREMENTS

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Students must complete at least eight upper-division courses (a minimum of 42 credits), including appropriate substitutions noted below. The courses include Psychology 100, Research Methods in Psychology; two courses from each of any two of the following subfields; one course from the remaining two subfields; and one course from outside the major.

Psychology 100, Research Methods in Psychology Developmental (courses numbered 101-119)

Cognitive (courses numbered 120-139)

Social (courses numbered 140-159)

Clinical-Personality (courses numbered 160-179)

Upper-division courses and their catalog descriptions are grouped within each of the subfields. At least one upper-division seminar course must be completed; these courses are identified within their catalog description by the phrase "satisfies seminar requirement." No more than two psychology courses numbered 183, 191A, 193, 194, and 195 may be used toward the upper-division requirements; however, these courses cannot be substituted for 101-179 courses in the same subfield as each other, or in a subfield in which the student has not taken a course in the 101-179 series. The eighth upper-division requirement must be a five-unit UCSC course outside of psychology chosen from a list of courses approved by the department. These lists of approved non-psychology courses are posted on the Psychology Department web site. At least six of the eight courses (including Psychology 100, Research Methods in Psychology, must be taken through the psychology program at UCSC, not transferred from elsewhere. After all substitutions have been made, students must satisfy the fundamental requirement that they take at least one upper-division UCSC psychology course from each of the four subfields.

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### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) requirement. The DC requirement in psychology is satisfied by completing Psychology 100, Research Methods in Psychology, and a seminar. Seminar courses are designated in the campus catalog with the text "satisfies seminar requirement."

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**PROGRAM PLANNING NOTES**

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Because some upper-division courses have additional prerequisites, students should read the descriptions of the upper-division courses carefully, noting the prerequisites for courses of interest to them.

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**PSYCHOLOGY MAJOR PLANNERS**

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Following are two recommended academic plans for students to complete during their first two years as preparation for the psychology major. Plan One is a

suggested guideline for students who are committed to the major early in their academic career. Plan Two is for students who are considering the major or who need more preparation. Students should note that Applied Mathematics and Statistics 3 or 6 is a requirement for the major and is a prerequisite for Psychology 2 and Psychology 100. Courses 20, 40, and 60 are recommended electives and are prerequisites for some upper-division psychology courses.

<b>Plan One</b>			
<b>Year</b>	<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
1st (frsh)	AMS 3 or 6	PSYC 2	PSYC 10
	PSYC 1	PSYC 40 (recommended)	PSYC 60 (recommended)
2nd (soph)	PSYC 100	(Begin upper- division coursework)	
	PSYC 20 (recommended)		

<b>Plan Two</b>			
<b>Year</b>	<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
1st (frsh)	MATH 2		PSYC 1
2nd (soph)	PSYC 40	PSYC 2	PSYC 10
	AMS 3 or 6		PSYC 60
3rd (jr)	PSYC 100	(Begin upper- division coursework)	

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## THE INTENSIVE PSYCHOLOGY MAJOR

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The intensive major is an option that any psychology major may choose to undertake. The intensive major would be advantageous for a student intending to go on to a graduate program in any area of psychology. 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. The intensive major requires 18 courses.

### REQUIREMENTS FOR THE INTENSIVE MAJOR

#### LOWER-DIVISION REQUIREMENTS

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Psychology 1 Introduction to Psychology (or equivalent)

Psychology 2 Introduction to Psychological Statistics (or equivalent, including Applied Mathematics and Statistics 5 or 7/L)

Psychology 10 Introduction to Developmental Psychology

Applied Mathematics and Statistics 3 or 6, or Mathematics 3 or 4 or 11/A (or equivalent)

#### Upper-Division Requirements

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Fourteen upper-division courses are required for the intensive major. These courses must include Psychology 100 and two courses from each of the following four subfields, one of which must be a seminar:

Developmental (courses numbered 102–119)

Cognitive (courses numbered 120–139)

Social (courses numbered 140–159)

Clinical-Personality (courses numbered 160–179)

No more than two psychology courses numbered 183, 191A or 193, may be used toward the upper-division requirements; however, these courses cannot be substituted for 101-179 courses in the same subfield as each other, or in a subfield in which the student has not taken a course in the 101-179 series.

Psychology 181, Psychological Data Analysis, Psychology 182, Advanced Research Methods, or an equivalent course approved by the department

Two quarters of Psychology 194, Advanced Research or 195, Senior Thesis

Two upper-division courses from one or more related areas outside of psychology from lists of courses pre-approved by the Psychology Department and posted on the department's web site, <http://psychology.ucsc.edu>. These two courses will not count toward the nine upper-division requirements listed above. (These

courses may not include psychology courses cross-listed with other programs or taught by psychology faculty.) These courses also cannot be counted twice in cases of double majors or minors.

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## COGNITIVE SCIENCE MAJOR

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The Psychology Department is the administrative home for the cognitive science major. Requirements for the cognitive science major may be reviewed under its separate entry in this catalog.

### QUALIFICATION TO THE MAJOR

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Students may petition to declare the psychology major once they have completed three lower-division courses: the mathematics requirement, Psychology 1, and Psychology 2 (or Applied Mathematics and Statistics 5 or 7/L). To be admitted to the major, students must demonstrate the attainment of foundational skills by receiving a grade of at least B- in (a) Psychology 1 and (b) Psychology 2 (or Applied Mathematics and Statistics 5 or 7/L). Students who pass these courses but do not achieve the required level of proficiency (i.e., who receive a grade of C, C+, or P) have alternative means of demonstrating foundational skills by: (a) completing Psychology 10 with a grade of B- or higher if the student did not receive a B- or higher in Psychology 1; (b) completing Applied Mathematics and Statistics 5 or 7/L with a grade of B- or higher if the student did not receive a B- or higher in Psychology 2; or (c) completing Psychology 2 with a grade of B- or higher if the student did not receive a grade of B- or higher in Applied Mathematics and Statistics 5 or 7/L.

Every student who satisfies qualification to the major and who petitions to declare the major by the declaration deadline will be admitted to the major. Students who satisfy the qualification to the major but who petition to declare the major after the deadline will be considered on a case-by-case basis for admission to the major; admission is not guaranteed. 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.

### COMPREHENSIVE REQUIREMENT

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UCSC 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 one of our seminars.

## Psychology

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."

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### ACADEMIC ADVISING

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Students are encouraged to approach faculty in their area of interest for further advising no later than the first quarter of their junior year to discuss an upper-division program of study and to plan for graduate training in psychology. As a supplement to academic advising offered by faculty members, the Psychology Department has an advising office located at 273 Social Sciences 2 Building, (831) 459-2002. The adviser assists 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.

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### SENIOR THESIS

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Students with adequate substantive and methodological preparation and a consistent record of strong academic performance may be eligible to apply to write a senior thesis. Students should initiate plans for a thesis no later than the first quarter of their senior year. Most faculty prefer to sponsor senior theses that are integrated with faculty research, so students are encouraged to talk with faculty before choosing a senior thesis topic. Information and applications are available in the department office, 273 Social Sciences 2.

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### HONORS

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Honors in the psychology major are awarded to graduating seniors whose UCSC 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 UCSC grade point average is a 3.9 or higher in psychology courses (1-189).

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### PSYCHOLOGY FIELD-STUDY PROGRAM

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The Psychology Field-Study Program provides qualified students an opportunity to apply classroom learning to direct experience in a community agency. Each year about 200 students develop new skills and clarify personal and professional goals by working as interns in schools, corporations, law enforcement agencies, research organizations, mental health services, and other social service agencies where they are supervised by professionals. Psychology faculty members sponsor

the students' field study helping them to integrate their field experience with coursework and guiding them in related academic projects.

The two-quarter program is open to junior and senior psychology majors who must apply at least one quarter in advance. There are information meetings and individual meetings to help students develop a learning plan, select a placement, and choose an academic project. Application information is included in the information meetings.

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### GRADUATE PROGRAM

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The psychology program offers three areas of specialization leading to the doctoral degree: cognitive, developmental, and social psychology. The program does not offer courses, training, or supervision in clinical 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.

The cognitive graduate program focuses on "Minds, Brains, and Beyond," offering a blend of traditional topics and new directions in cognitive science. With core strengths in language, memory, and perception, we are exploring topics such as: faces, speech, body movements, and embodied cognition; how forgetting helps memory; metaphors and analogies; cognitive aesthetics; natural language use in conversation; cognition and technology; human performance and information processing. Our graduates find careers in academia, tech industries, and more.

Faculty and graduate students in the UCSC program in developmental psychology conduct research that addresses individual, interpersonal, and cultural processes of development. Our program is unique in at least two ways. First, we emphasize diversity in development, including variations related to culture, ethnicity, race, gender, economic opportunity, and personality. Second, we focus on people's development as lived experience. Accordingly, our faculty and graduate students consider human development as it is embedded in settings, such as the family, peers, schools, museums, work, media, community, and culture. Among the topics studied by the developmental faculty are: knowledge acquisition in infancy and childhood;

## Psychology

moral and emotional development; language and cognitive development; social competence and intimacy; learning through observation and social interaction; communication and narrative in the development of self and relationships; personal and social identities; coping with prejudice and discrimination; school success and occupational aspirations; and diversity issues in university outreach programs. Our faculty and graduate students utilize a combination of quantitative and qualitative methods. Graduates from the developmental psychology program attain successful careers, including positions in academia, research institutions, and community organizations.

The social psychology graduate program at UCSC 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 access; feminisms; institutional analysis; intersectionality; narrative and identity; political conflict, violence, and peace-building; political psychology; poverty and economic justice; power and oppression; psychology and law; sexual identity and society; 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 web site. The department's graduate program brochure, and faculty research are available on the department web site.

Students enrolled in the psychology graduate program will complete a first-year and second-year research project. All graduate students must enroll and participate in the colloquium series each quarter (Psychology 230 for cognitive, Psychology 242 for developmental, and Psychology 231 for social). First-year students must take two courses in statistics (Psychology 204 and Psychology 214A) and a two-quarter proseminar sequence during fall and winter quarters. (Psychology 224A and 224B for cognitive, Psychology 244A and 244B for developmental, and Psychology 211A and 211B for social.) Students are also required to serve as a teaching assistant for at least two courses during their graduate career (one of which must be Psychology 10 for developmental and Psychology 40 for social).

Additional requirements for the cognitive area include: three advanced cognitive graduate courses, a graduate course in developmental psychology, a graduate course in social psychology, and a substantive advanced course in a discipline other than psychology.

Additional requirements for the developmental area include: Psychology 225A, Psychology 225B, Psychology 246, one other advanced developmental graduate seminar course, a graduate course in cognitive psychology, a graduate course in social psychology, and a substantive advanced course in a discipline other than psychology. Developmental graduate students are also required to complete a professional practicum between the end of their second year and end of their third year.

Additional requirements for the social area include: Psychology 210, Psychology 248, Psychology 249 or Psychology 261, 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.

Students are required to take their graduate courses as Satisfactory/Unsatisfactory.

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

## Psychology

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. 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. 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.

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## PSYCHOLOGY FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**Nameera Akhtar**

Cognitive and social cognitive processes in early language development, social-cognitive development in young children, bilingual development

**Margarita Azmitia**

How culture, peers, family, and schools provide a context for adolescents and young adults' development; how close relationships influence the educational pathways and identity development of ethnically and socioeconomically diverse populations and the role of family, friends, and peers in adolescents and young adults' development; how adolescents and young adults manage school transitions, such as the transition to middle school and the transition to college

**Douglas Bonett**

Psychometrics and statistics

**Heather E. Bullock**

Social class, poverty and economic inequality, welfare policy, feminist psychology, intersections of classism, racism, and sexism

**Maureen A. Callanan**

Cognitive and language development in the social context of family activities, development of word meanings and concepts, the construction of causal explanations in parent-child conversations

**Faye J. Crosby**

Gender, social identity, and social justice, especially affirmative action

**Jean E. Fox Tree**

Psycholinguistics: production and comprehension of spontaneous speech and writing, including discourse markers, prosody, gestures, the effects of communicative technologies on how people communicate, and other topics

**Raymond W. Gibbs Jr.**

Language, thought, and embodiment; special emphasis on metaphor, pragmatics, and cognitive science

**Craig W. Haney**

Applications of social psychological principles to legal settings, assessment of the psychological effects of living and working in institutional environments, social contextual origins of violence, development of alternative legal and institutional forms

**Campbell Leaper**

The developmental and social psychology of gender in childhood, adolescence, and adulthood; specific interests include gender-related variations in the following: self-concept and social identity; intersectionality; language and social interaction; social relationships, academic achievement (including STEM); the media; perceptions and consequences of sexism

**Anthony R. Pratkanis**

Social influence; attitude structure, function, and change

**Barbara Rogoff**

Human development in sociocultural activity; informal and formal arrangements for learning; adult/child and peer communication in families and schools in diverse cultural communities (especially in Guatemala Mexico and the U.S.); learning through observation and collaboration

**Steve Whittaker**

Human Computer Interaction: Psychological models of computer use. The design, development and evaluation of computational tools to support memory and conversation

**Eileen L. Zurbriggen**

Connections between power and sex; sexual aggression and abuse; trauma; sexual decision-making; sexuality and media, the sexualization of girls and women; power in romantic relationships; adolescent sexual development; authoritarianism; feminist political psychology

ASSOCIATE PROFESSOR

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**Shelly A. Grabe**

Structural and individual components of women's rights violations and social justice in the context of globalization; partnership with grassroots women's organizations; embodied oppression

**Phillip L. Hammack**

Identity, politics, and narrative; culture, power, and social categorization; social and political context of sexual identity development; community climate, social policy, and sexual and gender identity diversity; social change and the life course of sexual minorities; queer intimacies and relationships

**Alan H. Kawamoto**

Empirical and computer simulation approaches to the study of perceptual and cognitive processes, reading, speech production

**Regina D. Langhout**

School-community-university collaboration; how schooling and neighborhood experiences are informed by social class, race, and gender; young people and empowerment; participatory action research

**Travis L. Seymour**

Role of short-term memory, consciousness, and executive control on the human performance of laboratory and applied tasks; cognitive processes amenable to strategic control and how they influence the way in which we maintain situational awareness; high levels of performance in complex cognitive tasks

**Su-hua Wang**

Cognitive development, infant cognition, theory of mind, learning through action, parent-infant interaction, cross-cultural research, children's use of new technology

**Margaret L. Wilson**

Visual, spatial, and embodied cognition, with a particular emphasis on how we analogize between domains of thought, using sensory or motor brain resources in the service of other tasks. Specific interests include synaesthesia, working memory, sign language, perception of body movement, dance cognition and the evolution of cognition.

ASSISTANT PROFESSOR

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**Christy Byrd**

Adolescents' understanding of race and ethnicity in their school contexts, particularly perceptions of school racial climate, racial identity beliefs, and implications for development, motivation, and achievement

**Rebecca Covarrubias**

Culture, self, and identity; social representations of race, gender, and social class in educational/health

contexts; student performance, belonging, and well-being; community and school interventions

**Audun Dahl**

Moral development; the early acquisition of moral norms through social interactions; helping behavior in young children; children's and adults' concerns with morality; emotional development

**Nicolas Davidenko**

Cognitive psychology, cognitive neuroscience, high-level perception, face recognition, mathematical modeling

**Benjamin Storm**

Remembering and forgetting in human memory; creative cognition; autobiographical memory; memory and metamemory considerations in learning and education

LECTURER

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**Kimberly Cardilla**

Developmental psychopathology, personality development, psychological and neuropsychological testing

**David A. "Tony" Hoffman, Ph.D.**

Child and adolescent development, developmental psychopathology, school psychology, pediatric psychology, children and war, children in high risk contexts

**Ralph H. Quinn**

Clinical psychology, moral development, psychology and religion, existential-humanistic psychology

**Donald T. Saposnek**

Childhood psychopathology, parenting and family interactions, children and divorce, family mediation, conflict resolution

**Veronica K. Tonay**

Clinical psychology, community mental health, dream research, psychobiography, creativity

EMERITI

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**Elliot Aronson, Emeritus**

**Bruce Bridgeman, Emeritus**

**Martin M. Chemers, Emeritus**

**Catherine R. Cooper, Emerita**

**G. William Domhoff, Emeritus**

**Per F. Gjerde, Emeritus**

**David M. Harrington, Emeritus**

**Michael Kahn, Emeritus**

**Pavel Machotka, Emeritus**

**Dominic W. Massaro, Emeritus**

**Melanie J. Mayer, Emerita**

**Barry McLaughlin, Emeritus**

**Thomas F. Pettigrew, Emeritus**  
**Avril Thorne, Emerita**



**Dane Archer, Professor Emeritus, Sociology**  
**Sri Kurniawan, Associate Professor, School of Engineering**

Human-computer interaction; human factors and ergonomics; accessibility; assistive technology; usability; empirical studies; user-centered design

**Jerome Neu, Professor, Humanities**

Philosophy of mind, emotions and culture, philosophy of law, psychoanalytic theory

**Roland G. Tharp, Professor Emeritus, Education and Psychology**

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## PSYCHOLOGY COURSES

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### LOWER-DIVISION COURSES

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**1. Introduction to Psychology. F,W,S**

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. (General Education Code(s): PE-H, IS.) (F) M. Callanan, (W) B. Storm, (S) K. Cardilla

**2. Introduction to Psychological Statistics. W,S**

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 course 181. Prerequisite(s): course 1 or 20, and Applied Mathematics and Statistics 3 or 6 or Mathematics 3 or 4 or 11A or satisfactory placement score on math placement exam or CEEB Advanced Placement Calculus AB exam. Enrollment limited to 165. (General Education Code(s): SR, Q.) (W) A. Dahl, (S) K. Cardilla

**10. Introduction to Developmental Psychology. F,W,S**

Addresses psychological development from conception to adolescence. Provides an overview

of developmental psychology. Prerequisite(s): course 1; Applied Mathematics and Statistics 3 or 6, or Math 3 or higher Mathematics courses; and course 2 or Applied Mathematics and Statistics 5 or 7/7L. (F) N. Akhtar, (W) C. Byrd, (S) S. Wang

**20A. Cognition: Fundamental Theories. F,W**

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 20, Introduction to Cognitive Psychology.) M. Wilson

**20B. Cognition: Applied Issues. \***

Introduces basic concepts in cognitive psychology with a focus on applications to real-world issues. Topics include perception, attention, memory, concepts, language, visual cognition, executive functions, and reasoning processes. The Staff

**40. Introduction to Social Psychology. F**

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. A. Pratkanis

**42. Student-Directed Seminar. F,W,S**

Seminars taught by upper-division or graduate students under faculty supervision. (See course 192.) The Staff

**60. Introduction to Personality Psychology. \***

An overview of major personality theories from Freud to the modern day, and an introduction to contemporary research on personality development and assessment. Prerequisite(s): course 1. The Staff

**65. Introduction to Humanistic Psychology. S**

Humanistic psychology is seen here as those contemporary aspects of the field which are explicitly directed toward life-enrichment for members of the culture. The course does not attempt a complete survey of these aspects, but rather explores some of them in depth and attempts to begin working toward an overall theory of the humanistic movement. (General Education Code(s): IS.) R. Quinn

**80A. Psychology and Religion. F**

Topics covered include myth and the unconscious, the varieties of religious experience, dualism, women and religion, the role of authority, transpersonal experience, conversion, disaffiliation, self and community. (General Education Code(s): T3-Social Sciences.) R. Quinn

**UPPER-DIVISION COURSES**

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**100. Research Methods in Psychology (7 credits). F,W,S**

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. (Formerly course 3.)

Prerequisite(s): Entry Level Writing and Composition requirements; Applied Mathematics and Statistics 2 or 3 or 6, or Mathematics 3 or higher level Mathematics course; and course 2 or Applied Mathematics and Statistics 5 or 7/7L. (W) F. Crosby, (FS) C. Sterling

**101. Topics in Developmental Psychology.**

These topics, offered at different times by different instructors, examine selected topics in developmental psychology. (Formerly course 100.) The Staff

**102. Adolescent Development: Adolescence into Young Adulthood. F**

Focuses on individual and relational development from early adolescence into young 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(s): courses 3 or 100 and course 10. M. Azmitia

**103. Adult Development and Aging. W**

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(s): courses 3 or 100 and course 10. M. Azmitia

**104. Development in Infancy. W**

Focuses on psychological development in infancy. Presents research on perceptual, cognitive, and social-emotional development during the first two years of life. (Formerly course 101.)

Prerequisite(s): courses 3 or 100, and 10. Enrollment restricted to psychology and cognitive science majors. N. Akhtar

**105. Children's Thinking. F**

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(s): courses 10 and 100. Enrollment restricted to psychology and cognitive science majors and minors. M. Callanan

**106. Social and Emotional Development. \***

An examination of contemporary theory and research on social and emotional development from infancy through childhood.

Prerequisite(s): courses 3 or 100 and 10. C. Leaper

**107. Gender and Development. W**

Examines the developmental psychology of gender in childhood and adolescence. Prerequisite(s): course 3 or 100, and course 10.

Enrollment restricted to psychology majors. C. Leaper

**108. Educational Psychology. \***

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(s): courses 10 and 100. C. Byrd

**110. Culture and Human Development (6 credits). W**

Examines theory, research, and methods of studying the inherent cultural basis of human development and variations and similarities in human lives and activities in different communities worldwide. The approach draws on ideas and observations from psychology, anthropology, linguistics, sociology, and history. Course includes lab exercises using interview and observation methodologies and presentations of library research. (Formerly course 113.) Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements and one of the following: course 3 or 100; Anthropology 1 or 2; Education 92A, 92B, or 92C; Latin American Studies 1; or Sociology 1. (General Education Code(s): W, E.) B. Rogoff

**112. Moral Development. \***

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(s): courses 10 and 100. A. Dahl

**115. Lifespan Developmental Psychopathology. S**

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(s): courses 3 or 100, 10, and 170. K. Cardilla

**118. Special Topics in Developmental Psychology. F,W,S**

**118A. Children and War. \***  
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(s): courses 3 or 100 and 10. D. Hoffman

**118B. Children in Extreme Circumstances. S**

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(s): courses 3 or 100 and 10. Enrollment limited to 60. D. Hoffman

**118C. Theory of Mind. \***

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(s): courses

10 and 100. Enrollment restricted to psychology majors. Enrollment limited to 60. S. Wang

**118D. Growing Up in Panem: Developmental Psychology of the Hunger Games. F**

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(s): courses 10 and 100. C. Byrd

**119. Senior Seminars in Developmental Psychology. F,W,S**

**119A. Development as a Sociocultural Process. F**  
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 seminar requirement. Satisfies senior comprehensive requirement. Prerequisite(s): satisfaction of Entry Level Writing, Composition requirements; course 3 or 100, Anthropology 1 or 2, Education 92A, 92B, or 92C, Latin American and Latino Studies 1, or Sociology 1. Enrollment restricted to seniors or by permission. Enrollment limited to 30. (General Education Code(s): W.) B. Rogoff

**119D. Cultural Perspectives on Adolescent Development. F**

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(s): courses 3 or 100 and 10 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to senior psychology majors or permission of instructor. Enrollment limited to 30. C. Cooper

**119E. The World of Babies. W**

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(s): satisfaction of Entry Level Writing and Composition requirements and course 100. Enrollment restricted to senior psychology and cognitive science majors. Enrollment limited to 30. S. Wang

**119F. Language Development. \***

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(s): satisfaction of Entry Level Writing and Composition requirements, course 10 and course 3 or 100. Enrollment restricted to senior psychology and cognitive science majors. Enrollment limited to 30. N. Akhtar

**119H. Children, Research, and Policy. S**

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 seminar requirement. Satisfies senior comprehensive requirement. (Formerly Developmental Psychology Research and "Real World" Problems) Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and course 3 or 100. Enrollment restricted to senior psychology majors. Enrollment limited to 30. (General Education Code(s): W.) M. Callanan

**119I. Special Topics in Narrative Development. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements; course 3 or 100; enrollment restricted to senior psychology majors. Course 60 recommended. Enrollment limited to 30. A. Thorne

**119K. Emotional Development. \***

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. Prerequisite(s): courses 10 and 100 and satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to senior psychology majors. Enrollment limited to 30. A. Dahl

**119M. Identity Development in Social and Cultural Contexts. S**

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(s): satisfaction of the Entry Level Writing and Composition requirements and course 3 or 100; course 102 strongly recommended. Enrollment restricted to senior psychology majors or by permission of instructor. Enrollment limited to 30. (General Education Code(s): W.) M. Azmitia

**119P. Children and Technology. \***

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 seminar and comprehensive requirements. Prerequisite(s): courses 1 and 10; and 3 or 100; and satisfaction of Entry Level Writing and Composition requirements. Enrollment restricted to senior psychology and cognitive science

majors. Enrollment limited to 30. M. Callanan

**119S. The Developmental Psychology of Love. \***

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. Prerequisite(s): course 100; satisfaction of entry-level writing and composition requirements. Enrollment restricted to senior psychology majors. Enrollment limited to 30. The Staff

**119T. Media Contexts of Adolescent and Young Adult Development. \***

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. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, course 10, and course 3 or 100. Course 102 is recommended. Enrollment restricted to senior psychology majors. Enrollment limited to 30. M. Azmitia

**120. Visual and Spatial Cognition. S**

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(s): course 1 or 20 or 20A, and course 100. Enrollment restricted to cognitive science and

## Psychology

psychology majors and minors.  
Enrollment limited to 60. M. Wilson

### **120D. Deafness and Sign Language. \***

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(s): course 1 or 20 or 20A, and course 100. Enrollment restricted to psychology and cognitive science majors and minors. M. Wilson

### **121. Perception. W**

Basic perceptual psychology, emphasizing the relationships between perception, neuroscience, and cognition. Topics include shape, color, and depth; hearing, taste, smell, and touch; and perceiving faces, voices, and language. Prerequisite(s): course 100. Enrollment restricted to psychology and cognitive science majors and minors. N. Davidenko

### **123. Cognitive Neuroscience. S**

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. (Formerly Behavioral Neuroscience) Prerequisite(s): course 100. Enrollment restricted to psychology and cognitive science majors and minors. Enrollment limited to 130. B. Bridgeman

### **124. Psychology of Reading. W**

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(s): course 100.  
Enrollment restricted to psychology and cognitive science majors and minors. A. Kawamoto

### **125. The Psychology of Language. F,S**

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(s): course 100. Enrollment restricted to psychology and cognitive science majors and minors. J. Fox Tree

### **127. Computer Mediated Communication. \***

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(s): course 100. Enrollment restricted to psychology and cognitive science majors and minors. S. Whittaker

### **128. Human Factors. \***

Human factors psychology studies human-machine interaction and computer usability, and involves diverse topics including displays and controls; human error; decision-making; psycholinguistics; and the role of fatigue, environmental stressors, user-interface design, and social/team factors that directly impact human performance. Prerequisite(s): course 100. Enrollment restricted to psychology and cognitive science majors and minors. S. Whittaker

### **129. Human Learning and Memory. W**

Examines basic theories, models, methods, and research findings in human memory. Both traditional and nontraditional topics are

covered. Prerequisite(s): course 100. Enrollment restricted to psychology and cognitive science majors and minors. B. Storm

### **130. Deception, Brain, and Behavior. W**

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(s): course 100; and course 20 or any upper-division cognitive course. Enrollment restricted to psychology and cognitive science majors and minors. T. Seymour

### **132. Neural Modeling. S**

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(s): course 100. Enrollment restricted to psychology and cognitive science majors and minors. Enrollment limited to 15. A. Kawamoto

### **135. Feelings and Emotions. F**

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(s): course 100 and psychology and cognitive science majors and minors; or linguistics, philosophy, or anthropology majors. R. Gibbs

**137. Mind, Body, and World. \***

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(s): course 100 and psychology and cognitive science majors; or linguistics, philosophy, or anthropology majors. R. Gibbs

**138. Computer Programming for the Cognitive Sciences. S**

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(s): course 1 or 20A or 20B, and 100. Enrollment restricted to psychology and cognitive science majors. T. Seymour

**139. Senior Seminars in Cognitive Psychology. F,W,S**

**139A. Cognitive Laboratory. \*** Advanced laboratory experience with research methods and phenomena in cognitive psychology. Satisfies the seminar requirement. Satisfies the comprehensive

requirement. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements and course 3 or 100. Enrollment restricted to senior psychology and cognitive science majors. Enrollment limited to 30. B. Storm

**139B. Consciousness. \***

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(s): Entry Level Writing and Composition requirements and course 3 or 100. Enrollment restricted to senior psychology, philosophy, anthropology, linguistics, and cognitive science majors. Enrollment limited to 30. R. Gibbs

**139D. Modeling Human Performance. F**

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 junior and senior psychology, cognitive science, computer science, and computer engineering majors, or by permission of instructor.

Prerequisite(s): Entry Level Writing and Composition requirements; course 3 or 100, and at least one of the following: course 121 or 123 or 128 or 129 or 132 or 138; or Computer Science 5C or 5J or 11 or

12A or 13H or 130 or 140. Enrollment limited to 30. T. Seymour

**139F. Psychology and Evolutionary Theory. W**

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 seminar requirement. Satisfies senior comprehensive requirement. Prerequisite(s): Entry Level Writing and Composition requirements and course 3 or 100. Enrollment restricted to senior psychology, anthropology, biology, philosophy, sociology, cognitive science, and feminist studies majors. Enrollment limited to 30. B. Bridgeman

**139G. Conversations. \***

Explores how conversations work and how speakers accomplish their goals in an interaction. Topics include conversational structure, turn-taking, variation in language use, and the functions of discourse markers (words like "um," "uh," and "you know"). Satisfies seminar requirement. Satisfies senior comprehensive requirement. Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements and course 3 or 100. Enrollment restricted to senior psychology and cognitive science majors. Enrollment limited to 30. J. Fox Tree

**139H. Weird Science. W**

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

## Psychology

scientific knowledge. Satisfies seminar requirement. Satisfies comprehensive requirement. (Formerly course 134.) Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements and course 3 or 100. Enrollment restricted to senior psychology and cognitive science majors. Enrollment limited to 30. J. Fox Tree

### **139J. Forgetting. S**

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. Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements and course 3 or 100. Enrollment restricted to senior psychology and cognitive science majors. Enrollment limited to 30. B. Storm

### **139K. Face Recognition. \***

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. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; and course 1 or 20 or 20A; and course 3 or 100. Enrollment restricted to senior cognitive science, neuroscience, and psychology majors. Enrollment limited to 30. N. Davidenko

### **140. Topics in Social Psychology.**

#### **140C. Health Psychology. \***

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. Prerequisite(s): courses 3 or 100. The Staff

#### **140F. Mind, Society, and Culture. F**

Introduces how social, cultural, and historical contexts shape psychological experiences, including human thought, perception, emotion, health, values, 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 with the United States (e.g., African Americans, Mexican Americans, Native Americans). Prerequisite(s): course 100. The Staff

#### **140G. Women's Lives in Context. F**

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(s): course 3 or 100, or Sociology 103B, or Feminist Studies 100, or Community Studies 100. Enrollment restricted to junior and senior psychology, feminist studies, sociology, and community studies majors. S. Grabe

#### **140H. Sexual Identity and Society. S**

Introduces the contemporary social and political significance of sexual identity, focusing on historic

persecution and stigmatization of individuals with same-sex desire. Examines scientific paradigms for the study of homosexuality; theories of the origin of sexual orientation, and the sexual minority experience; identity and social activism; queer theory and politics; and contemporary issues in sexual orientation, social justice, and social policy. P. Hammack

#### **140L. Women's Bodies and Psychological Well-Being. \***

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 imbedded in societal institutions contributes to women's marginalized status. Enrollment restricted to senior psychology, sociology, feminist studies, and community studies majors. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; and courses 3 or 100, or Sociology 103B, or Feminist Studies 100, or Community Studies 100. Enrollment limited to 60. S. Grabe

#### **140Q. Social Psychology of Gender. \***

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(s): courses 3 or 100. C. Leaper

#### **140T. Psychology of Trauma. S**

Overview of psychological theory and research on trauma and traumatic stress, including

## Psychology

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(s): course 3 or 100 or permission of instructor. E. Zurbriggen

### **141. Privacy and Surveillance. \***

Survey of the 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(s): course 100. E. Zurbriggen

### **142. Psychology of Oppression and Liberation. F**

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(s): course 3 or 100 or feminist studies, sociology, community studies, or politics majors. (General Education Code(s): E.) The Staff

### **145. Social Influence. W**

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(s): course 3 or 100. A. Pratkanis

### **145D. Social Psychology of Autocracy and Democracy. S**

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(s): course 100. A. Pratkanis

### **146. The Social Context. \***

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(s): courses 3 or 100 and course 40; or Sociology 136. The Staff

### **147A. Psychology and Law. W**

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. (Also offered as Legal Studies 147A. Students cannot receive credit for both courses.) Prerequisite(s): courses 3 or 100; and course 40 is highly recommended prior to taking this course. Enrollment restricted to psychology, pre-psychology, and legal studies majors. The Staff

### **147B. Psychology and Law. \***

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. (Also offered as Legal Studies 147B. Students cannot receive credit for both courses.) Prerequisite(s): course 147A. C. Haney

### **149. Community Psychology: Transforming Communities. W**

Introduction to community psychology, a discipline that blends social psychology, sociology, and anthropology. Class topics include levels of analysis, ecologies, prevention, intervention, feminism, empowerment, sense of community, coalition building, and social justice and action. Prerequisite(s): course 3 or 100. Enrollment restricted to juniors and seniors. R. Langhout

### **150. Social Psychology of Flimflam. F**

Why do we believe strange things? This course investigates such flimflams as beliefs in the Loch Ness Monster, quack health care, and racial superiority to illustrate the underlying social psychological principles that lead us to adopt weird attitudes. (Formerly course 159I.) Prerequisite(s): course 100. (General Education Code(s): SI.) A. Pratkanis

### **153. The Psychology of Poverty and Social Class. \***

Examines how social class shapes attitudes, beliefs, and behaviors. Emphasis is placed on structural barriers and their impact on the

## Psychology

well-being of low-income groups. Strategies for reducing classist discrimination, improving interclass relations, and strengthening social policy are discussed. Prerequisite: course 3 or 100, or anthropology, community studies, economics, legal studies, politics, sociology, or feminist studies majors. H. Bullock

### **155. Social-Community Psychology in Practice. \***

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): Courses 3 or 100; courses 149 and 182 are recommended prior to taking this course. Admission by application and interview only. (Formerly course 159P.) Enrollment limited to 15. (General Education Code(s): PR-S.) R. Langhout

### **159. Senior Seminars in Social Psychology. F,W,S**

#### **159A. Sexual Identity. \***

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(s): course 3 or 100, and satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to senior psychology majors. Enrollment limited to 30. P. Hammack

#### **159D. Psychology of Sexual Aggression. F**

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 seminar requirement. Satisfies senior comprehensive requirement. Prerequisite(s): Entry Level Writing and Composition requirements; and course 3 or 100. Enrollment restricted to senior psychology or feminist studies majors or permission of instructor. Enrollment limited to 30. E. Zurbriggen

#### **159E. Peace Psychology. W**

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 seminar requirement. Satisfies senior comprehensive requirement. Prerequisite(s): Entry Level Writing and Composition requirements; and course 3 or 100. Enrollment restricted to senior psychology majors. Enrollment limited to 30. D. Hoffman

#### **159H. Community-Based Interventions. F**

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(s): satisfaction of Entry Level Writing and Composition requirements and course 3 or 100. Enrollment restricted to senior psychology majors. Enrollment limited to 30. The Staff

#### **159X. Psychology of Social Activism. W**

Covers social-psychological scholarship relevant to social justice activism that receives limited academic attention in conventional psychology. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements, and course 3 or 100. Enrollment restricted to senior psychology majors. Enrollment limited to 30. S. Grabe

#### **165. Systems of Psychotherapy. F**

A review of the major methods of psychotherapy most currently practiced, including ethical standards and dilemmas, and client-therapist-system variables affecting efficacy. Prerequisite(s): course 3 or 100; course 60 or 170 recommended. V. Tonay

#### **166. Personality Assessment. W**

How do we really know a person? Course provides experience assessing such individual differences as intimacy motivation, dominance, 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 counseling contexts. Prerequisite(s): course 100; course 60 highly recommended as preparation. V. Tonay

**167. Clinical Psychology. S**

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(s): courses 3 or 100, and 60 or 65; course 170 is recommended as preparation. R. Quinn

**168. The Study of Dreams. S**

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(s): course 3. G. Domhoff

**169. Community Mental Health. W**

How can we help to improve mental health community-wide? Examines theory, method, and efficacy research of current outreach, prevention, and intervention methods with various mental health populations in community settings (e.g., victims of violence, immigrants, severely mentally ill); presents characteristics of successful community mental health agencies and programs.

Prerequisite(s): course 100. Courses 60 or 170 recommended. V. Tonay

**170. Abnormal Psychology. W,S**

Survey of theory, research, and intervention in human psychopathology. Covers psychological, biological, developmental, and socio-cultural approaches. Prerequisite(s): course

3 or 100; course 60 highly recommended as preparation. D. Hoffman

**171. Childhood Psychopathology. F**

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(s): courses 3 or 100; and course 10. Course 170 strongly recommended. D. Saposnek

**175. Personality, Relationships, and Emotions. F**

Explores the nature, origins, and development of human personality as it relates to emotions in the context of close relationships. Prerequisite(s): course 3 or 100. Courses 10 and 60 recommended as preparation. K. Cardilla

**179. Senior Seminars in Personality Psychology. F,W,S**

**179A. Theories of Moral Psychology. W**

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. Course satisfies seminar requirement. Satisfies senior comprehensive requirement. Prerequisite(s): essay required on a moral issue or dilemma relevant to the student's life. Prerequisite(s): Entry Level Writing and Composition requirements; and

course 3 or 100. Enrollment restricted to senior psychology majors. Enrollment limited to 30. R. Quinn

**179B. Children and Divorce. S**

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 seminar and senior comprehensive requirements. Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements; course 3 or 100. Enrollment restricted to senior psychology majors. Enrollment limited to 30. D. Saposnek

**179D. Psychological Interpretation. F**

Seminar explores major psychodynamic interpretive systems in depth, applying them to film, music, literature, dreams, and art, as well as traditional psychological measures, such as the Thematic Apperception Test (TAT) and interview protocols. Students interpret current media productions with an eye to psychological meaning and implications for author, audience, and engendering culture. Prerequisite(s): course 100, and course 60 or course 165; satisfaction of the Entry Level Writing and Composition requirements. Enrollment is restricted to senior psychology majors. Enrollment limited to 30. V. Tonay

**179G. Child, Youth, and Family Assistance in the Community. \***

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 course 193.

Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements and course 3 or 100. Enrollment restricted to senior psychology majors. Enrollment limited to 30. D. Hoffman

**181. Psychological Data Analysis. S**

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(s): course 3 or 100. (General Education Code(s): Q.) D. Bonett

**182. Qualitative Research Methods. W**

Designed to equip students with the ability to evaluate, conceive, and carry out psychological research. A variety of techniques (observational, ethnographic, and field) examined and experienced.

Students carry out research projects. (Formerly Advanced Research Methods.) Prerequisite: course 3 or 100. Enrollment limited to 30. (General Education Code(s): PR-E.) K. Cardilla

**183. History and Systems of Psychology. \***

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. (Formerly course 180) Prerequisite(s): course 3 or 100. P. Hammack

**190. Senior Seminars.**

Special topics with a format varying each quarter. The Staff

**191. Teaching College Psychology.**

A series designed to provide undergraduates at the upper-division level with an opportunity to participate in planning and teaching college-level psychology. May not be repeated for credit. The Staff

**191A. Introduction to Teaching Psychology. F,W,S**

Students lead discussion groups and provide one-to-one tutoring for courses 1 or 3 or 100. Admission requires essay describing interest in becoming a course assistant, copies of psychology evaluations, and a letter of recommendation from a psychology faculty member; completion of some upper-division psychology courses prior to enrollment in this course. Prerequisite(s): course 3 or 100. Enrollment restricted to psychology majors. (Formerly "Introduction to Psychology.") Enrollment limited to 20. (F) M. Callanan, (W) B. Storm, (S) K. Cardilla

**192. Directed Student Teaching. F,W,S**

Teaching of a lower-division seminar (course 42) under faculty supervision. Available only to upper-division or graduate students. Students submit petition to sponsoring agency. The Staff

**193. Field Study. F,W,S**

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): courses 3 or 100. Enrollment restricted to junior and senior psychology majors. May be repeated for credit. (General Education Code(s): PR-S.) The Staff

**193A. Developmental Field Study. F,W,S**

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): courses 3 or 100. Enrollment restricted to junior and senior psychology majors. Enrollment limited to 100. May be repeated for credit. (General Education Code(s): PR-S.) The Staff

**193B. Cognitive Field Study. F,W,S**

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

## Psychology

advance to the Psychology Field Study Office. Prerequisite(s): courses 3 or 100. Enrollment restricted to junior and senior psychology majors. May be repeated for credit. (General Education Code(s): PR-S.) The Staff

**193C. Social Field Study. F,W,S**  
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): courses 3 or 100. Enrollment restricted to junior and senior psychology majors. May be repeated for credit. (General Education Code(s): PR-S.) The Staff

**193D. Clinical/Personality Field Study. F,W,S**  
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): courses 3 or 100. Enrollment restricted to junior and senior psychology majors. May be repeated for credit. (General Education Code(s): PR-S.) The Staff

**194. Advanced Research in Special Topics.**  
Provides a means for a small group of students to do research on a particular topic in consultation with a faculty sponsor. The Staff

**194A. Advanced Developmental Research. F,W,S**  
Provides students with intensive experience conducting current research in developmental psychology. Students submit

petition to sponsoring agency. May be repeated for credit. The Staff

**194B. Advanced Cognitive Research. F,W,S**  
Provides students with intensive experience conducting current research in cognitive psychology. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**194C. Advanced Social Research. F,W,S**  
Provides students with intensive experience conducting current research in social psychology. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**195A. Senior Thesis. F,W,S**  
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. The Staff

**195B. Senior Thesis. F,W,S**  
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. The Staff

**195C. Senior Thesis. F,W,S**  
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. The Staff

**198. Independent Field Study. F,W,S**  
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. May be repeated for credit. The Staff

**199. Tutorial. F,W,S**

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. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S**

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. May be repeated for credit. The Staff

**199G. Tutorial (3 credits). F,W,S**

Specialized study with individual faculty. May not be applied toward major requirements. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**GRADUATE COURSES**

**204. Quantitative Data Analysis. F**

Intermediate statistical methods widely used in psychology (e.g., ANOVA, ANCOVA, multiple-comparisons, repeated-measures, correlational analyses) and corresponding SPSS or R programs. Enrollment restricted to graduate students. Enrollment limited to 20. D. Bonett

**210. The Experimental Method in Social Psychology. \***

Explores the philosophy and practice of the experimental method in social psychology. Enrollment restricted to graduate students. E. Zurbriggen

**211A. Proseminar: Social Justice and the Individual. F**

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. Enrollment restricted to psychology graduate students; undergraduates planning graduate work in social psychology may enroll with permission of instructor. Enrollment limited to 15. P. Hammack

**211B. Social Justice, Society, and Policy. W**

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. (Formerly Proseminar: Groups in Society.) Enrollment restricted to

psychology graduate students. Undergraduates planning graduate work in social psychology may enroll with permission of instructor. Enrollment limited to 20. C. Haney

**213. Special Topics in Social Psychology. S**

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. Enrollment restricted to graduate students. May be repeated for credit. The Staff

**214A. Multivariate Techniques for Psychology. W**

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(s): course 204. Enrollment limited to graduate students. Enrollment limited to 20. D. Bonett

**214B. Advanced Multivariate Techniques for Psychology. \***

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(s): course 214A. D. Bonett

**215. Production and Comprehension of Spontaneous Communication. \***

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. (Formerly Production and Comprehension of Spontaneous Speech.) Enrollment restricted to psychology graduate students. J. Fox Tree

**220. Special Topics in Human Memory. \***

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. Enrollment restricted to graduate students. Enrollment limited to 12. The Staff

**221. Visual Perception. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

**222. Topics in Lexical Organization. \***

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. Enrollment restricted to psychology graduate students;

undergraduates who have completed course 124 may enroll with permission of instructor. Enrollment limited to 10. A. Kawamoto

**224A. Proseminar: Cognitive I. F**

A proseminar reviewing current topics in cognitive psychology, designed to introduce new graduate students to the field. Enrollment restricted to psychology graduate students. Enrollment limited to 10. N. Davidenko, M. Wilson

**224B. Proseminar: Cognitive II. W**

A proseminar reviewing current topics in cognitive psychology, designed to introduce new graduate students to the field. Enrollment restricted to psychology graduate students. Enrollment limited to 10. A. Kawamoto, T. Seymour

**225A. Introduction to Developmental Research I (3 credits). F**

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. Enrollment restricted to psychology graduate students or with instructor's permission. S. Wang

**225B. Introduction to Developmental Research II (3 credits). W**

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(s): course 225A. Enrollment restricted to psychology graduate students or with instructor's permission. S. Wang

**225C. Introduction to Developmental Research III. F**

Focuses on drawing reasonable conclusions from research findings by working on students' first-year research projects and critiques of existing research. (Formerly course 225B, Introduction to Developmental Research II.) Prerequisite(s): courses 225A and 225B. Enrollment restricted to developmental psychology graduate students or by permission of the instructor. C. Byrd

**227. Contemporary Issues in Psychology of Language. F**

Special topics in thought and language are examined from the perspectives of cognitive science. Particular attention given to embodied experience and higher-order cognition. Enrollment restricted to graduate students. May be repeated for credit. R. Gibbs

**230. Research in Cognitive Psychology Seminar. F,W,S**

Colloquium series to study and critique research in cognitive psychology and cognitive science. Enrollment restricted to psychology graduate students. May be repeated for credit. (F) N. Davidenko, (W) M. Wilson, (S) T. Seymour

## Psychology

### **231. Research in Social Psychology Seminar. F,W,S**

Seminar to study, critique, and develop research in social psychology. Enrollment restricted to psychology graduate students. May be repeated for credit. (F) P. Hammack, (WS) S. Grabe

### **232. Evolution of Cognition. \***

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. Enrollment restricted to graduate students. The Staff

### **235. Infant Development in Contexts. \***

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. Enrollment restricted to psychology graduate students. S. Wang

### **242. Research in Developmental Psychology Seminar. F,W,S**

Seminar to study, critique, and develop research in developmental psychology. Enrollment restricted to psychology graduate students. May be repeated for credit. (S) C. Byrd, (FW) A. Dahl

### **244A. Proseminar I: Cognitive and Language Development. F**

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, such as the relation between culture and cognitive and

language development. Enrollment restricted to graduate students. N. Akhtar

### **244B. Proseminar II: Social and Personality Development. W**

An examination of contemporary theory and research on social and personality development across the lifespan. Enrollment restricted to graduate students. M. Azmitia

### **246. Cultural Diversity in Human Development. \***

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. Enrollment restricted to graduate students. Enrollment limited to 20. B. Rogoff

### **247. Special Topics in Developmental Psychology. S**

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. Enrollment restricted to graduate students. Enrollment limited to 15. May be repeated for credit. A. Dahl

### **248. Survey Methods. S**

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. Enrollment restricted to graduate students. Enrollment limited to 10. S. Grabe

### **249. Field Methodologies and Social Ethnography. F**

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. Enrollment restricted to graduate students. Enrollment limited to 10. Offered in alternate academic years. C. Haney

### **250. Prejudice and Social Relations. \***

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. Enrollment restricted to graduate students. The Staff

### **251. Feminist Theory and Social Psychology. \***

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. (Also offered as Feminist Studies 251. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. The Staff

### **252. Special Topics in Cognitive Psychology. F,W**

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

## Psychology

covered. Enrollment restricted to graduate students. May be repeated for credit. (F) B. Storm, (W) S. Whittaker

### **253. Theory and Research in Intergroup Relations. \***

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. Enrollment restricted to psychology graduate students; undergraduates considering graduate work in social psychology are encouraged to enroll with permission of instructor. Enrollment limited to 12. Offered in alternate academic years. The Staff

### **254. Psychology of Gender. \***

Course reviews recent theory, research, and applications in the psychology of gender. Developmental, social-psychological, cultural, and feminist approaches are emphasized. Enrollment restricted to graduate students. C. Leaper

### **256. Psychology of Social Class and Economic Justice. \***

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. Enrollment restricted to graduate students. Enrollment limited to 10. H. Bullock

### **261. Participatory Action Research. \***

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. Enrollment restricted to graduate students. Enrollment limited to 10. R. Langhout

### **264. Transnational Feminism, Development, and Psychology. \***

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. Enrollment restricted to graduate psychology students, or by permission of instructor. S. Grabe

### **290. Proseminar.**

Various topics to be offered throughout the year. The Staff

### **290B. Advanced Developmental Research and Writing (2 credits). F,W,S**

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. Enrollment restricted to graduate students. May be repeated for credit. B. Rogoff

### **290C. Professional Development (3 credits). F**

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). Multiple-term course; students receive 6 credits in the second quarter of attendance; the grade and evaluation submitted for the final quarter applies to the previous quarter. Enrollment restricted to advanced psychology graduate students. May be repeated for credit. B. Rogoff

### **290E. Grant Writing for Psychologists. W**

Discusses how to write and put together a grant proposal for psychological research, culminating in a completed proposal. Enrollment restricted to psychology graduate students. J. Fox Tree

### **293. Field Study. F,W,S**

Student-designed and student-conducted research carried out in field settings. The Staff

### **297. Independent Study. F,W,S**

Independent study and research under faculty supervision. The Staff

### **299. Thesis Research. F,W,S**

The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# QUEER AND SEXUALITY STUDIES

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2015-16 General Catalog

416 Humanities 1

(831) 459-2757

[fmst@ucsc.edu](mailto:fmst@ucsc.edu)

<http://qss.ucsc.edu/>

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## PROGRAM DESCRIPTION

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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 <http://queer.ucsc.edu> or via e-mail at [queer@ucsc.edu](mailto: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 Anjali Arondekar in the department of Feminist Studies in the Humanities Division ([aarondek@ucsc.edu](mailto:aarondek@ucsc.edu)) for information about course offerings and resources.

Revised: 09/01/15

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# RELIGIOUS STUDIES

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2015-16 General Catalog

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## PROGRAM STATEMENT

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Religious studies is not a separate program at UCSC, but students interested in the study of religion can select a degree plan from several majors and complement the requirements from a broad array of courses that focus on religion. Majors particularly appropriate for the study of religion at UCSC include the following: anthropology, history, history of art and visual culture, literature, and philosophy. The Department of History of Art and Visual Culture offers a [concentration in religion and visual culture](#).

Students interested in the study of religion may build an independent program of study by fulfilling the requirements of one of the majors listed above and, under the guidance of a member of the faculty, use

elective courses to develop a concentration of study appropriate to their interests and needs. One of the following faculty should be contacted to discuss a course of study in religion at UCSC: [Murray Baumgarten](#) (literature), [Raoul Birnbaum](#) (history of art and visual culture), [Nathaniel Deutsch](#) (history), [Susan Harding](#) (anthropology), [Ralph Quinn](#) (psychology), [Triloki N. Pandey](#) (anthropology), [Cynthia Polecristi](#) (history), and [Marilyn Westerkamp](#) (history).

Students seeking information on an individual major in religious studies should contact their college academic preceptor.

Revised: 09/01/15

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# RUSSIAN

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2015-16 General Catalog

Department of Languages and Applied Linguistics

218 Cowell College

(831) 459-2054

<http://language.ucsc.edu>

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## PROGRAM DESCRIPTION

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The Department of Languages and Applied Linguistics offers beginning and intermediate level courses in Russian that provide a comprehensive introduction to the language and develop basic communicative skills (speaking, listening, reading, and writing) within the framework of contemporary Russian culture. Russian 1 and 4 are offered fall quarter; Russian 2, winter

quarter; and Russian 3, spring quarter. Students may also select an individual major in Russian studies.

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### CAMPUS LANGUAGE LABORATORIES AND PLACEMENT EXAMS

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Information about these topics can be found under [Department of Languages and Applied Linguistics](#).

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## RUSSIAN COURSES

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### LOWER-DIVISION COURSES

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#### 1. First-Year Russian. F

Aural comprehension, speaking, reading, and writing. Recitation and laboratory. Elementary sequence (1-2-3) begins in the fall quarter only. (Formerly Instruction in the Russian Language.) The Staff

#### 2. First-Year Russian. W

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. (Formerly Instruction in the Russian Language.)

Prerequisite(s): course 1 or by consent of instructor. The Staff

#### 3. First-Year Russian. S

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. (Formerly Instruction in the Russian Language.)

Prerequisite(s): course 2 or by consent of instructor. The Staff

#### 4. Second-Year Russian. F

Second-year courses designed to improve functional competence in speaking, listening, reading, and writing by activating basic grammar covered in introductory courses. Grammatical explanations and exercises supplemented with short readings and films. (Formerly Intermediate Russian.)

Prerequisite(s): course 3 or by consent of instructor. (General Education Code(s): CC, IH.) The Staff

#### 5. Second-Year Russian. \*

Second-year courses designed to improve functional competence in speaking, listening, reading, and writing by activating basic grammar covered in introductory courses. Grammatical explanations and exercises supplemented with short readings and films. (Formerly Intermediate Russian.)

Prerequisite(s): course 4 or by consent of instructor. (General Education Code(s): CC, IH.) The Staff

#### 6. Second-Year Russian. \*

Second-year courses designed to improve functional competence in speaking, listening, reading, and writing by activating basic grammar covered in introductory courses. Grammatical explanations and exercises supplemented with short readings and films. (Formerly Intermediate Russian.)

Prerequisite(s): course 5 or by consent of instructor. (General Education Code(s): CC, IH.) The Staff

#### 94. Group Tutorial. F,W,S

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. The Staff

#### 99. Tutorial. F,W,S

Students submit petition to sponsoring agency. The Staff

Russian

**99F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. The Staff

**UPPER-DIVISION COURSES**

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**194. Group Tutorial. F,W,S**

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. Enrollment limited to 10. May be repeated for credit. The Staff

**199. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# SCIENCE COMMUNICATION

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2015-16 General Catalog

Kresge Annex A  
(831) 459-4475  
<http://scicom.ucsc.edu>

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## PROGRAM DESCRIPTION

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The Science Communication (SCIC) Program is a graduate certificate program composed 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 certificate in science writing. For more information about our graduation rates, the median debt of students who completed the program, and other important information, visit [our web site](#).

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### GRADUATE CERTIFICATE IN SCIENCE WRITING

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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 web site, <http://scicom.ucsc.edu/>.

The program consists of a required sequence of six courses covering the main skills of professional journalism: SCIC 201A, Reporting and Writing Science News; SCIC 201B: The Science Feature; SCI 201C: Profile and Essay Writing; SCIC 201D: Policy and Investigative Reporting; SCIC 201E: Multimedia Science News; and SCIC 202: Writing and Editing Workshop. Assignments in each course are overseen by practicing journalists and editors, and many course projects are

published regionally and nationally. In addition, students must complete at least two part-time writing and reporting internships during the academic year at media organizations and news offices, through formal arrangements overseen by the Science Communication Program. The six required courses, plus two course-equivalent internships, constitute the eight courses (40 units) required for the graduate certificate. The final requirement is a full-time professional internship in science journalism or public outreach at a venue approved by the program director, for a minimum of 10 weeks.

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### ADMISSION TO THE SCIENCE WRITING GRADUATE PROGRAM

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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 web site at <http://graddiv.ucsc.edu>.

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### FURTHER INFORMATION

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Details about the science writing graduate certificate program may be obtained from the Science Communication Program office, the web site, or by sending e-mail to [scicom@ucsc.edu](mailto:scicom@ucsc.edu).

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## FACULTY AND PROFESSIONAL INTERESTS

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**Peter Aldhous, Lecturer in Science Writing**

Science journalism, feature writing, magazine editing, investigative and policy reporting

**Marc A. DesJardins, Lecturer in Science Writing**

Newspaper reporting and editing

**Erika Check Hayden, Lecturer in Science Writing**

Reporting science news, biomedical reporting, social media

**Janet Hopson, Lecturer in Science Writing**

Science and nature journalism, essay and profile writing

**Robert W. Irion, Senior Lecturer in Science Writing, Program Director**

Science journalism, newswriting, feature writing, and editing

**Martha Mendoza, Lecturer in Science Writing**

Newswriting, investigative and policy reporting

**Kenneth McLaughlin, Lecturer in Science Writing**

Science journalism, newspaper reporting and writing

**Mary K. Miller, Lecturer in Science Writing**

Science journalism, web media, videography, educational and museum outreach

**Evelyn J. Strauss, Lecturer in Science Writing**

Science and health journalism, science advocacy, essay and profile writing

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## SCIENCE COMMUNICATION COURSES

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### UPPER-DIVISION COURSES

**160. Introduction to Science Writing. S**

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. (Also offered as Biology:Ecology & Evolutionary 188. Students cannot receive credit for both courses.) Prerequisite(s): satisfaction of the Entry Level Writing and C1, C2 requirements. Enrollment restricted to junior and senior physical and biological sciences majors. Enrollment limited to 18. (General Education Code(s): W.) R. Irion

**199. Tutorial. F,W,S**

Students submit petition to sponsoring agency. The Staff

**199F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. The Staff

### GRADUATE COURSES

**201A. Reporting and Writing Science News. F**

A survey of the conventions of newspaper journalism and the special application of those conventions to scientific and technological subjects. Enrollment restricted to graduate students formally accepted into the writing track of the Science Communication Program. R. Irion

**201B. The Science Feature. W**

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. Enrollment restricted to graduate students formally accepted into the writing track of the Science Communication Program. R. Irion

**201C. Profile and Essay Writing. W**

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. (Formerly The Science Essay.) Enrollment restricted to graduate students formally accepted into the writing track of the Science Communication Program. E. Strauss

**201D. Policy and Investigative Reporting. S**

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. Enrollment restricted to graduate students formally accepted into the writing track of the Science Communication Program. P. Aldhous, M. Mendoza

**201E. Multimedia Science News.**

**S**

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. Enrollment restricted to graduate students formally accepted into the writing track of the Science Communication Program. M. Miller, R. Irion

**202. Writing and Editing Workshop. F**

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. Enrollment restricted to graduate students formally accepted into the writing track of the Science Communication Program. May be repeated for credit. K. Mclaughlin, M. Desjardins

**297. Independent Study. F,W,S**

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. May be repeated for credit. The Staff

Revised: 09/01/15

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# SOCIAL DOCUMENTATION

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2015-16 General Catalog  
101 Communications Building  
(831) 459-3445  
[socdoc@ucsc.edu](mailto:socdoc@ucsc.edu)  
<http://film.ucsc.edu/socdoc>

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## PROGRAM DESCRIPTION

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This is a crucial time for the documentary, as traditional sources of journalistic investigation and reporting are diminishing while new platforms and publishing entities emerge, untested opinions dominate the Internet, veracity is under constant attack, and audiences increasingly must search hard to find reliable perspectives on the world. It is at this moment that the Social Documentation (SocDoc) program has come into being to train the next generation of documentarians in creative and scholarly approaches to experience, representation, and argument. Founded in 2005, the SocDoc program at UCSC taps faculty across the campus to provide students with access to expertise and crosses traditional disciplinary lines in an effort to ground master of arts (M.A.) students in the deepest understanding of subject as well as medium. SocDoc has emerged as an exciting new center of gravity for an innovative new discipline. Our students have earned grants and awards for their thesis documentaries, produced around the globe, in film/video, photography, other digital media, and a range of documentary styles. 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.

The UCSC Social Documentation (housed in the Film and Digital Media Department) program is a two-year, full-time, graduate-level program leading to an M.A. degree. The program offers students a chance to develop expertise in the understanding and production of social documentaries in film/video, multimedia, photography, new digital media. Students may also work in other documentary mediums related to faculty expertise. Students learn how to translate various scholarly interpretations of social life into effective, accessible, and professional quality media projects.

Upon completion of the program, master of arts degree holders will be qualified to enter documentary-related professions such as documentary directing, producing, or editing. Degree holders may work within industries such as public broadcasting, or in the documentary

field, as independent producers and artists, or for archival centers or museums or within organizations committed to issues for which documentaries can advance understanding and change. Degree holders may also choose to pursue a doctor of philosophy (Ph.D.) degree in related fields in the arts, humanities, or social sciences.

The program is designed to provide opportunities for the graduate student who is actively committed to social justice to work on a full-time basis beyond the boundaries of the university. Master of arts candidates build a curriculum around a required set of core courses that offer a foundation in the theory and practice of social documentary, elective courses in their substantive area of interest, and the creation of a two-year documentary project that is the final requirement for the degree. Courses and faculty expertise are related to social justice in terms of broad structural and social changes and community-based organizing. Documentaries in the program have called attention to a range of under-recognized communities, problems, and structural inadequacies.

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## OBJECTIVES

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The Social Documentation program aims to train its graduates in critical thinking and the use of visual, audio, electronic, and print media, as well as historic presentations and ethnographies, dedicated to the documentation of underrepresented areas of community life. The curriculum concentrates on the analysis of social problems, the creation of a critical approach to the collection and presentation of documentary material, and on the role of effective documentary in social change. For the master's degree, students produce projects of their own: documentaries in film or video; photographic essays (in book, gallery, or cross-platform presentations); multimedia and audio productions; and Internet or other web-platform projects.

Special features of the program include its focus on the study of "ordinary life" and its emphasis on training students to produce original social analysis in broadly

## Social Documentation

representational forms. The course of study includes training in the techniques of appropriate media and systems of representation. The unique emphasis of the Social Documentation program, however, is the acquisition of a level of academic rigor in the chosen subject of focus, an insistence on humanities and social scientific methodologies, a reliance on an ethical process of production that takes its subjects into full account, and a commitment to research in the development of material for extra-academic uses and audiences. Broadcast and theatrical media have increasingly recognized the importance of ancillary distribution through partnerships with pertinent communities of interest, just as the Internet is increasingly utilized for added depth and community interaction on issues. The Social Documentation program aims to prepare documentarians for newly evolving social media landscapes. At the same time, students receive training in the basic theories of social documentation with the aim of applying these theories to the analysis, prioritization, and solution of social problems.

Graduates are expected to generate work that will have an impact on the world outside the academy and to develop an understanding of documentary practices as well as social codes that can form a foundation for future work in their targeted subject area and arena of practice. The master's project, which constitutes the culmination of the two years of study, is to be given a public exhibition or reading, and becomes the springboard for continuing work after graduation.

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### REQUIREMENTS

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The Social Documentation program has a required core curriculum around which students develop a plan of study. Each student has two advisers, one for creative guidance and the other for topical expertise, who will be involved in designing each student's study and project plans. Full-time enrollment is required.

A total of 72 credits is required to complete the master's degree in social documentation, comprising a combination of seminars on social documentary and social science research designed specifically for the SocDoc students, other courses on campus selected by students individually on the basis of relevance to the proposed project, and cohort courses focused on conceptualizing, executing, and completing the students' social documentary master's projects. There are eight required core courses.

Required courses for the first year are as follows:

- 200 Approaches to Social Documentary
- 202 Practice of Social Documentary

- 208 Social Science Research and Social Representation
- 270 Project Planning
- Required courses for the second year:
- 204 Ways of Seeing and Hearing
- 294A Production, Analysis, Editing
- 294B Production, Analysis, Editing
- 294C Production, Analysis, Editing

In addition to these mandatory courses, an additional 32 credits must be secured through electives as identified on an individual basis, offered by other departments, or through independent study classes with or approved by faculty advisers.

To satisfy requirements for the master of arts degree, a student must complete the first year of required courses and electives. By the end of the first year, before summer quarter begins, students will have completed a proposal for their documentary project, which will be the basis for a required oral qualifying examination conducted by the graduate director and faculty advisers. This proposal will include 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 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 represented 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: how will it move from analysis to critique?

The second year is focused on the final documentary project required for completion of the master's degree. This project must reflect original research and creative activity while demonstrating a command of related previous work by others. With an understanding of budgetary, equipment, and time limitations, students' electronic, digital, and photographic or other projects should reflect a level of quality appropriate for publication, exhibition, or broadcast (including digital/web-cast).

## Social Documentation

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).

**Online/Digital Platform Projects.** To be clarified with program chair and advisers, given the evolving nature of this field.

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

The final examination consists of the public presentation of the project.

In addition, every project must be accompanied by a written essay 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 web site for the thesis project along with production stills, a press kit, and a draft civic engagement campaign.

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 program chair.

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### GOALS FOR SOCIAL DOCUMENTATION GRADUATES

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The Social Documentation program prepares graduates with critical skills and professional tools well suited to careers in the evolving fields of documentary media in the private and public sectors, for collaboration on community-based projects, for a range of activities geared to the analysis and documentation of sociopolitical issues, and for work with private and public organizations in need of media expertise and analysis. It is expected that students will make careers in the nonprofit fields evolving to link social justice organizations with media outlets, as well as in a range of public campaigns and initiatives. They will also be well equipped to function as independent

documentarians working on behalf of social change within the expanding sectors of media production and representational intervention.

Also, given the emphasis on the histories of the social documentary and on developing methods suitable for contemporary challenges, many graduates are likely to enter the field of education on a part- or full-time basis. The Social Documentation program's teaching assistant (TA) training program, in conjunction with the Film and Digital Media Department, provides graduates with the preparation necessary to exercise pedagogical options.

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### DESIGNATED EMPHASIS

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UC Santa Cruz graduate students enrolled in doctoral programs may obtain a designated emphasis in social documentation as part of their Ph.D. degree. Students must meet the following requirements in order to obtain the designated emphasis:

- Secure approval from a member of the Social Documentation Program core faculty to serve as the adviser for the Designated Emphasis.
- Have one core faculty member from the Social Documentation core faculty serve on the student's qualifying examination committee or dissertation committee.
- 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. 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 social documentation advisor.
- Successfully complete four graduate courses within the Social Documentation Program curriculum. The courses must be pre-approved by the student's designated emphasis advisor. In most cases, these courses would include 200, 202, and two others, but may be adapted to fit the needs of particular students.

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## SOCIAL DOCUMENTATION FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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#### **B. Ruby Rich**

Documentary film and video, new queer cinema, feminist film history, Latin American and Latina/o cinema and other global/regional cinemas, U.S. independent film and video, the essay film, film festival studies, and the making/marketing of foreign films in the U.S. As Editor of "Film Quarterly," also advising on journal submission and the craft of editing

#### **Gustavo Vazquez (Film and Digital Media)**

Film and video production, documentary and experimental cross-cultural experiences in film

### ASSOCIATE PROFESSOR

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#### **John Jota Leños**

Documentary animation, social documentation, social art practice, community arts, Chicana/o art and culture, new media, critical media studies, cultural studies, documentary photography, installation art, public art and interventionist art practice

#### **Marcia Ochoa (Feminist Studies)**

Gender and sexuality, race and ethnicity, Latina/o studies, media and cultural studies, ethnography of media, feminism, queer theory, geography, multimedia production, graphic design, colonialism and modernity, Latin American studies—Colombia and Venezuela, social documentation

### ASSISTANT PROFESSOR

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#### **Jennifer Maytorena Taylor**

Social documentation, Latino and Latin American communities, public education, popular culture, religion, incarceration and justice, urban and community development, collaborative practices in journalism and production, transmedia



### PROFESSOR

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#### **David Brundage (History)**

American immigration history, with particular focus on the Irish in America and on transnational immigrant politics; U.S. labor and social history; modern Irish history

#### **Sharon Daniel (Film and Digital Media)**

New media documentary and database documentary; social, economic, environmental and criminal justice; Participatory culture, Community-based public art in information and communications environments; social and political aspects of information design; net art, social-practice art

#### **Jennifer González (History of Art and Visual Culture)**

Contemporary theories of visual culture, semiotics, critical museum studies, photography, public and activist art in the U.S.

#### **Herman S. Gray (Sociology)**

Cultural studies, media and television studies, black cultural politics, social theory

#### **Lisbeth Haas (History and Feminist Studies)**

U.S.-Mexico borderlands and border studies, Chicano and Native American history, visual culture in the colonial Americas; California; historical memory, theory, and historical methodology

#### **Craig W. Haney (Psychology)**

Applications of social psychological principles to legal settings, assessment of the psychological effects of living and working in institutional environments, social contextual origins of violence, development of alternative legal and institutional forms

#### **Gail B. Hershatter (History)**

Modern Chinese social and cultural history; labor history; gender history, history of sexuality; feminist theory, history, memory, and nostalgia

#### **Eli E. Hollander, Professor Emeritus**

#### **Charles L. Lord, Professor Emeritus**

#### **Lourdes Martinez-Echazabal (Latin American and Latino Studies)**

Latin American and Caribbean literatures; Afro-Latin American literatuers, cultures, and societies; found[n]ational narratives; Brazilian literature; literatuers of Cuba and the Cuban diaspora, cinema and social change in Cuba; critical race theory, queer literature and cinema in Latin America

#### **Olga Nájera-Ramírez (Anthropology)**

Folklore theory, ritual, festival, dance, greater Mexican culture, history and folklore, transnationalism, identity; expressive culture, ethnomusicology, bilingual communication, gender, history, and culture of Latin America, the U.S., and Mexico

#### **Margaret Morse, Professor Emerita**

#### **Eric C. Porter (History and History of Consciousness)**

Black cultural and intellectual history; US cultural history and cultural studies; critical race and ethnic studies; popular music and jazz studies; black radicalism; urban studies

**Jennifer Reardon (Sociology)**

Science studies; sociology of science, technology, and medicine; feminist theory; race/ethnicity/gender/sexuality/class; biology and society

**Lisa Rofel (Anthropology)**

Critical theory, anthropology of modernity, popular/public culture, gender and sexuality, queer theory, transnational capitalism, postcolonial and transnational feminism, China

**Warren Sack (Film and Digital Media)**

Software design and media theory

**Shelley Stamp (Film and Digital Media)**

Film history, theory, and criticism; silent cinema; early Hollywood; women's filmmaking; film censorship; histories of moviegoing; feminist approaches to cinema

**Nancy Stoller, Professor Emerita**

**Dana Y. Takagi (Sociology)**

Social inequality, affect, religion, race, quantitative analysis

**Karen Tei Yamashita (Literature)**

History and anthropology of Japanese immigration to Brazil; Asian American literature; modern fiction; playwriting

**Lewis Watts, Professor Emeritus (Art)**

**David T. Wellman, Professor Emeritus**

ASSOCIATE PROFESSOR

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**Lawrence Andrews (Film and Digital Media)**

Documentary, sound, animation, installation

**David Henry Anthony III (History)**

African and African American history, art, music, literature, and cinema; eastern and southern Africa; African vernacular expression; Black Atlantic; Indian Ocean world; African and African American linkages; Islamic civilization; African diaspora studies; African Sufism; African religion; missiology, liberation theology; world history

**Miriam Greenberg (Sociology)**

Urban sociology, media studies, cultural studies, political economy, globalization, and urban political ecology

**Irene Gustafson (Film and Digital Media)**

Producing across the boundaries between "theory" and "practice," non-fiction media, experimental film/video, production design, gender and queer studies

**Jonathan Kahana (Film and Digital Media)**

Documentary film and media; film and politics; American film history; essay film; cultural and social theory; media publics; arts of historical re-enactment;

war and cultural memory; audio culture; disciplines of listening

**L.S. Kim (Film and Digital Media)**

Television history and theory, racial discourse, feminist criticism, Asian-American cultural theory and production, industrial practices and social change in both mainstream Hollywood and alternative media

**Peter Limbrick (Film and Digital Media)**

International cinemas, especially Arab and Middle Eastern cinemas and Australasian cinemas; postcolonial theories and settler colonialism; theories of globalization and transnationalism; intersections of race, gender, and sexuality; queer theory; film and video history and historiography

**Irene Lusztig (Film and Digital Media)**

Film and video production, experimental ethnography and essayistic nonfiction; representations of historical memory; archives, propaganda and training films; feminist film practices; medical film; autobiographical filmmaking; interactive documentary; editing

**Rick Prelinger (Film and Digital Media)**

Critical archival studies; personal and institutional recordkeeping; access to the cultural record; media and social change; ephemeral cinema; amateur and home movies; participatory documentary; digital scholarship; cinema and public history

**Felicity Amaya Schaeffer (Feminist Studies)**

Transnational feminisms; sexuality and migration; technology and race; intimacy and globalization; Latin American/Latino studies; border studies; Chicana/o studies; biometrics and security studies

**Yiman Wang (Film and Digital Media)**

Theory of difference; film history and theory; colonial/semi-colonial/postcolonial/postsocialist modes of media production and exchange; border-crossing film remakes; silent cinema; translation theory and cinema; acting theory/practice and ethnic star studies with focus on Anna May Wong; transnational connections and ramifications of Chinese cinema and documentary; fan culture; East Asian cinemas

**Matthew Wolf-Meyer (Anthropology)**

Anthropology and history of medicine and public health, science studies, American studies, popular culture, the United States and the United Kingdom

ASSISTANT PROFESSOR

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**Anna Friz (Film and Digital Media)**

Sound studies and production, transmission art, media art installation and performance, media (especially radio) history, methodologies for research creation

**Jennifer Horne (Film and Digital Media)**

Media citizenship; non-theatrical film and film exhibition; archives and technologies of information; film preservation; mass media and humanitarianism; cinema and media history and historiography; institutions, disciplinarity, and the politics of knowledge; feminist theory

**Soraya Murray (Film and Digital Media)**

Contemporary visual culture and representation including: new media art; projected arts; photography;

electronic games; theories of art and globalization; representations of migration and otherness

**Susana Ruiz (Film and Digital Media)**

Game design; games as forms of activism and art; animation; participatory culture; social art practice; non-fiction storytelling; theory/practice hybridity; Theatre of the Oppressed; expanded documentary; interaction design; worldbuilding; transmedia production, scholarship, and activism

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## SOCIAL DOCUMENTATION COURSES

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### GRADUATE COURSES

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**200. Approaches to Social Documentation. F**

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.

Enrollment restricted to graduate students. Enrollment limited to 15. B. Rich

**202. Practice of Social Documentary. F**

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.

Enrollment restricted to social documentation graduate students. Enrollment limited to 15. J. Taylor

**204. Ways of Seeing and Hearing. F**

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. (Also offered as Feminist Studies 204. Students cannot receive credit for both courses.) Enrollment restricted to graduate students. The Staff

**208. Social Science Research and Social Representation. W**

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. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

**220. Oral History. \***

Introduction to the theory and practice of oral history. Seminar participants read foundational texts in oral history, historical memory, public history, and social documentary. Students conduct two oral-history interviews; write synthesis essays; and complete a seminar paper. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

**270. Project Planning for the Social Documentary. S**

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. Enrollment

restricted to social documentation graduate students. Enrollment limited to 15. J. Leanos

**280. Video Production of the Social Documentary. S**

Intensive directing and producing course that covers conceptualization, research, treatment and proposal writing, interview technique, camera, editing, production, and distribution. Enrollment restricted to social documentation graduate students. Open to qualified undergraduates with permission of instructor. Enrollment limited to 15. G. Vazquez

**290. Special Topics in Social Documentation. F**

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. Enrollment restricted to social documentation graduate students. Enrollment limited to 15. May be repeated for credit. The Staff

## Social Documentation

### **292. Special Topics (2 credits). F,W,S**

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. Enrollment restricted to graduate students. Enrollment limited to 15. May be repeated for credit. The Staff

### **293. Studies and Practice for Social Documentation, Filmmaking, and New Media. W,S**

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. (Also offered as Film and Digital Media 233. Students cannot receive credit for both courses.) Enrollment restricted to graduate students in social documentation. Graduate students from other programs may enroll by permission of the instructor. Enrollment limited to 15. J. Leanos, The Staff

**294A. Production/Analysis/Editing. F**  
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. Enrollment restricted to social documentation graduate students. Enrollment limited to 15. I. Lusztig

**294B. Production/Analysis/Editing. W**  
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. Enrollment restricted to social documentation graduate students. Enrollment limited to 15. B. Rich

**294C. Production/Analysis/Editing. S**  
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(s): courses 294A and 294B. Enrollment restricted to social documentation graduate students. J. Taylor

**295. Project Completion. F,W,S**  
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. May be repeated for credit. The Staff

**297. Independent Study. F,W,S**  
Study either related to a course being taken or a totally independent study. Enrollment restricted to graduate students. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**297F. Independent Study (2 credits). F,W,S**  
Students submit petition to course-sponsoring agency. Enrollment restricted to graduate students. May be repeated for credit. The Staff  
\* Not offered in 2015-16

Revised: 09/01/15

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## SOCIAL SCIENCES

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2015-16 General Catalog

460 Humanities and Social Sciences Building

(831) 459-3212

<http://socialsciences.ucsc.edu/>

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### PROGRAM DESCRIPTION

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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 web site at:

<http://socialsciences.ucsc.edu/>.

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### SOCIAL SCIENCES FACULTY AND PROFESSIONAL INTERESTS

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**Julie Guthman, Professor of Social Sciences**

Sustainable agriculture and alternative food movements, California agriculture, international political economy of food and agriculture, politics of obesity, political ecology, race and food, epigenetics and environmental health, critical nutrition, critical human geography

**Mary Beth Pudup, Associate Professor of Social Sciences**

Regional studies, economic justice, urban and regional political economy, historical geography of the U.S., public policy, community gardening and urban agriculture, non-profit sector

**Robert L. Meister, Professor of Political and Social Thought and History of Consciousness**

Critical human rights theory, moral philosophy, political jurisprudence, political theology, political economy, psychoanalysis, Marxian theory, financialization, 21st century capitalism, institutional analysis, historical justice, and antidiscrimination law

Revised: 09/01/15

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# SOCIOLOGY

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2015-16 General Catalog  
226 College Eight  
(831) 459-4888  
<http://sociology.ucsc.edu>

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## PROGRAM DESCRIPTION

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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.

Sociology faculty members are engaged in research on a wide range of topics, such as medicine and technology; labor studies; the intersection of class, race, gender and sexualities; environmental sociology; sociology of emotion and affect; queer studies; the cultural politics of sex work; globalization and international development; cultural politics and the politicization of culture; drugs in society; global inequality, crime, and deviance; international law; legal institutions; sustainability; popular culture and cultural studies; media studies; urban studies; political economy; critical ethnography; discourse and conversational analysis; identities and identity changes; social movements; Latino/a communities; and migration. Sociology faculty use a number of approaches and methods, including ethnography, comparative and historical analysis, conversational and discourse analysis, qualitative interviews, and survey research.

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 the social construction of gender, emerging professions in health care, utopian communities, human development in Costa Rica, mass communication, the social effects of war, family violence, sustainable development in Bolivia, sanitation in Kenya and Haiti, street children in India, African soccer players in Europe, gay and lesbian families, Latino educational success, and cross-cultural family welfare policies.

The sociology major at UCSC 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 education for undergraduates interested in the study of contemporary society and social problems.

Global Information and Social Enterprise Studies (GISES) is an innovative service learning program developed in collaboration with the Global Information Internship Program (GIIP). 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, student projects engage with local and global organizations to democratize globalization, deepen social justice, reduce poverty, support digital education, and advance the transition to a sustainable world. By combining the spirit of social entrepreneurship with innovative information technologies, GISES students reduce the digital divide by strengthening the informational, communication and organizational capacity of schools, community organizations, and non-governmental organizations (NGOs). The GISES program provides an excellent

## Sociology

foundation for students pursuing careers in non-profit management, social advocacy, and education. 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, she or he should declare the intensive sociology major. A student who majors in any field other than sociology should declare GISES as a minor.

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### PROGRAM LEARNING OUTCOMES

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Students graduating with a B.A. degree in sociology will:

1. 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;
2. 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. formulate effective and convincing written and/or oral arguments;
4. demonstrate an understanding of, and the ability to use, several of the major classical and/or contemporary perspectives in social theory;
5. demonstrate an understanding of several of the major social science research methodologies; and
6. demonstrate knowledge of some of the key substantive areas within the field of sociology.

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### DECLARATION OF THE GENERAL SOCIOLOGY MAJOR, INTENSIVE SOCIOLOGY MAJOR, COMBINED LALS MAJOR, SOCIOLOGY MINOR, OR GISES MINOR

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The Sociology Department offers three undergraduate majors: 1) a general sociology major; 2) an intensive sociology major; and 3) a combined major with Latin American and Latino studies. Additionally, there are two minors, one in sociology and one in Global Information and Social Enterprise Studies (GISES).

Students must take two of the following courses prior to petitioning for entry to the general sociology major: Sociology 1, Introduction to Sociology, Sociology 10, Issues and Problems in American Society, or Sociology 15, World Society. Students who pass two of these courses with a grade of C+ or better will be allowed to declare the sociology major.

Students must take five courses prior to petitioning for entry to the intensive sociology major: Sociology 1, Introduction to Sociology; Sociology 15, World Society; Sociology 30A, Introduction to Global Information and

Social Enterprise Studies; Sociology 30B, Designing ICT Projects for Social Enterprises; and Sociology 30C, Project Implementation and Grant Writing for Social Entrepreneurs. To be considered for admission to the intensive major, students are required to obtain a GPA of 2.8 or above in these courses and submit a list of six upper-division courses they propose to complete the upper-division elective requirement, including a brief statement of justification for how each elective contributes to the specific project they will complete for Sociology 196G, Project Practicum.

Students must take two of the following courses, Sociology 1, 10, or 15, prior to petitioning for entry to the sociology/Latin American and Latino studies major. Students who pass two of these courses with a grade of C+ or better and who have completed LALS 1 will be allowed to declare the combined major.

Students must take one of the following courses, Sociology 1, 10, or 15 prior to petitioning for entry to the sociology minor.

Students must take four courses prior to petitioning for entry to the GISES minor: Sociology 15, World Society; Sociology 30A, Introduction to Global Information and Social Enterprise Studies; Sociology 30B, Designing ICT Projects for Social Enterprises; and Sociology 30C, Project Implementation and Grant Writing for Social Entrepreneurs. To be considered for admission to the GISES minor, students must take the four courses listed and submit a list of four upper-division courses they propose to complete the upper-division elective requirement, including a brief statement of justification for how each elective contributes to the specific project they will complete for Sociology 196G, Project Practicum.

Equivalent courses may be taken at other universities or at community colleges.

Students who intend to declare one of the department's majors listed above must take the lower-division courses for letter grades. In addition, students who intend to declare the intensive sociology major must take 30A, 30B, and 30C for letter grades.

Courses for which the grade of W is given are not counted in the computation of the GPA. The department will evaluate grades for repeated courses following the university's grading policy for repeated courses.

Students may petition for admission to the major by filling out the campus's Declaration of Major form, and by supplying evidence of their performance in the required lower-division courses. For specific details, refer to the Sociology Department web site, [sociology.ucsc.edu](http://sociology.ucsc.edu), or the department's undergraduate adviser.

## Sociology

Transfer students who cannot complete two lower-division courses (Sociology 1, 10, or 15 at UCSC, or equivalents at another university, or at a community college with a grade of C+ or better before university policy requires them to declare a major should contact the sociology undergraduate adviser.

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### APPEAL OF NEGATIVE DECISIONS

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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 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. Letters of appeal should describe any extenuating circumstances that might have affected the student's record.

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### REQUIREMENTS OF THE GENERAL SOCIOLOGY MAJOR

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For more details, students may consult the sociology handbook, available online at <http://sociology.ucsc.edu>, or at the department office, 226 College Eight.

Sociology majors are required to take a total of 11 courses (2 lower-division courses in preparation for the major, 4 prescribed upper-division core courses, and 5 upper-division electives). In addition, they must successfully complete the comprehensive requirement prior to graduation.

**Lower-division preparation.** All sociology majors are required to take two of the following courses or their equivalents.

- 1, Introduction to Sociology
- 10, Issues and Problems in American Society
- 15, World Society

**Upper-division core courses.** The following four sociology courses are required as the foundation of theoretical and methodological training in the discipline. Students are encouraged to take these courses early in their academic career.

- 103A, Statistical Methods
- 103B, The Logic and Methods of Social Inquiry
- 105A, Classical Social Theory
- 105B, Contemporary Social Theory

**Upper-division advanced coursework.** Five additional upper-division sociology courses 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. Refer to the [Sociology](#)

[Department Undergraduate Handbook](#) or the Sociology Undergraduate Adviser for a list of recommended courses within a specific specialization.

**Comprehensive requirement.** Prior to graduation, all sociology majors are required to complete one of the following comprehensive requirements.

- **Senior thesis.** The prerequisite for the senior thesis is course 103B. Students who would like to write a senior thesis must submit to their preferred faculty thesis sponsor a proposal that includes a one- to three-page description of the work to be undertaken, a brief bibliography, and materials from relevant courses, and key words describing the thesis topic. The proposal must be submitted by the second week of the quarter, one quarter prior to the commencement of the thesis work. Students unsuccessful in obtaining a thesis sponsor through these means may submit their proposals to the department's undergraduate education committee (UEC) by the second week of the quarter, one quarter prior to the commencement of the thesis work. UEC members will review the merits of these proposals and assign the ones they approve to faculty members who have not yet agreed to serve as thesis advisers for the following year. Students will be notified of the outcome of the UEC's deliberations within three weeks.
- **Capstone course.** Sociology 196A, Capstone: The Sociologist as Public Intellectual. Upper-division lecture course that explores public sociology and integrates current research with theoretical strands in sociology.

In exceptional cases, students unable to take the senior capstone course may be allowed to substitute a portfolio of work. This substitution must be approved in advance, by the department chair. The portfolio option consists of: 1) portfolio of materials from (at least) three upper-division sociology courses; 2) a synthetic essay; 3) a paper consisting of new research by the student on some contemporary social or political issue, analyzed using the theoretical and empirical materials from those three courses. See the department for additional information.

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### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) Requirement. The goals of the Sociology Department's disciplinary communication are to teach students to think critically by designing, evaluating, and analyzing

existing or proposed research studies to create knowledge through synthesizing and integrating information from a variety of sources pertaining to a complex social problem, and to develop and apply evidence-based writing skills. Course 103B, The Logic and Methods of Social Inquiry, satisfies the Disciplinary Communication Requirement for students in programs administered by the Sociology Department. Combined majors with Latin American and Latino Studies should refer to the Latin American and Latino Studies Department for their Disciplinary Communication requirement.

### SOCIOLOGY MAJOR PLANNER ONE

The following is a recommended academic plan for students to begin the sociology major.

Plan One			
Year	Fall	Winter	Spring
1st (frsh)	SOCY 1*	SOCY 10*	SOCY 1*
2nd (soph)	SOCY 15*	SOCY 103A	SOCY 103B
3rd (jr)	SOCY 105A	SOCY 105B	

\*Two of courses 1, 10, or 15 required for the major

### SOCIOLOGY MAJOR PLANNER TWO

The following is a recommended academic plan for transfer students entering the sociology major as juniors. It is assumed that course 1 and/or course 10 equivalencies were completed at the previous college.

Students Beginning in Fall Quarter

Plan Two—Option 1			
Year	Fall	Winter	Spring
3rd (jr)	SOCY 15	SOCY 103A	SOCY 103B
	SOCY 105A	SOCY 105B	

Students Beginning in Winter Quarter

Plan Two—Option 2			
Year	Fall	Winter	Spring
3rd (jr)		SOCY 10	SOCY 103B
		SOCY 103A	
4th (sr)	SOCY 105A	SOCY 105B	

All majors must complete the remaining five upper-division courses in their junior and senior years.

## REQUIREMENTS OF THE INTENSIVE SOCIOLOGY MAJOR

The intensive major is an option for students wishing to major in sociology and focus in the area of Global Information and Social Enterprise Studies (GISES). The global information and enterprise studies intensive sociology 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 16 courses (five prescribed lower-division courses in preparation for the major, four prescribed upper-division core courses, six upper-division electives, and a project practicum course). In addition, they must successfully complete the comprehensive requirement prior to graduation.

**Lower-division preparation.** Students must take the following five courses or their equivalents.

1, Introduction to Sociology

15, World Society

30A, Introduction to Global Information and Social Enterprise Studies

30B, Designing ICT Projects for Social Enterprises

30C, Project Implementation and Grant Writing for Social Entrepreneurs

Upper-division core courses. The following four sociology courses are required as the foundation of theoretical and methodological training in the discipline. Students are encouraged to take these courses early in their academic career.

103A, Statistical Methods

103B, The Logic and Methods of Social Inquiry

105A, Classical Social Theory

105B, Contemporary Social Theory

**Upper-division advanced coursework.** Six additional upper-division courses are required. The student's choice of electives must be approved either by the student's project adviser or by the director of GISES at the time of submitting the major declaration.

**Project practicum.** Students must enroll in Sociology 196G Project Practicum and complete their GISES capstone project. Contact the Sociology Department undergraduate adviser for more detailed guidelines regarding the GISES capstone project. At least one quarter before expected graduation, students are required to submit electronically a polished, focused, and concise GISES project proposal (five-page

## Sociology

maximum), to the director of GISES and the sociology undergraduate adviser. The project proposal 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 GISES major or minor, the integrated project—narrative and digital deliverable—must be mounted on the appropriate web-enabled database managed by the Global Information Internship Program (GIIP).

### **Disciplinary Communication (DC) requirement.**

All students are required to satisfy the Disciplinary Communications Requirement in their major. The goals of the Sociology Department's disciplinary communication are to teach students to think critically by designing, evaluating, and analyzing existing or proposed research studies; to create knowledge through synthesizing and integrating information from a variety of sources pertaining to a complex social problem; and to develop and apply evidence-based writing skills. Course 103B, The Logic and Methods of Social Inquiry, satisfies the Disciplinary Communication Requirement for students in sociology programs.

**Comprehensive requirement.** Prior to graduation, students are required to complete one of the following comprehensive requirements.

- **Senior thesis.** The prerequisite for the senior thesis is course 103B. Students who would like to write a senior thesis must submit to their preferred faculty thesis sponsor a proposal that includes a one- to three-page description of the work to be undertaken, a brief bibliography, materials from relevant courses, and key words describing the thesis topic. The proposal must be submitted by the second week of the quarter, one quarter prior to the commencement of the thesis work. Students unsuccessful in obtaining a thesis sponsor through these means may submit their proposals to the department's undergraduate education committee (UEC) by the second week of the quarter, one quarter prior to the commencement of the thesis work. UEC members will review the merits of these proposals and assign the ones they approve to faculty members who have not yet agreed to serve as thesis advisers for the following year. Students will be notified of the outcome of the UEC's deliberations within three weeks.

- **Capstone course.** Sociology 196A, Capstone: The Sociologist as Public Intellectual. Upper-division lecture course that explores public sociology and integrates current research with theoretical strands in sociology.

In exceptional cases, students unable to take the senior capstone course may be allowed to substitute a portfolio of work. This substitution must be approved in advance by the department chair. The portfolio option consists of: 1) portfolio of materials from (at least) three upper-division sociology courses; 2) a synthetic essay; 3) a paper consisting of new research by the student on some contemporary social or political issue, analyzed using the theoretical and empirical materials from those three courses. See the department for additional information.

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## REQUIREMENTS OF THE COMBINED MAJOR IN SOCIOLOGY AND LATIN AMERICAN AND LATINO STUDIES

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Students may choose to declare a combined major in sociology and Latin American and Latino studies. The requirements (listed below) should be examined carefully before choosing the combined major option. Students must complete the lower-division sociology courses with a grade of C+ or better and LALS 1, and both departments must approve a study plan before the major can be declared. Each department determines major and thesis honors separately.

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### LANGUAGE STUDY

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Students must demonstrate proficiency in Spanish or Portuguese equivalent to the completion of Spanish 6 or 56 or Spanish for Spanish Speakers 63 or Portuguese 65A-B.

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## SOCIOLOGY/LATIN AMERICAN AND LATINO STUDIES

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Students are required to take a total of 13 courses and to satisfy a senior comprehensive requirement. There are three lower-division course requirements, two from the Sociology Department and one from the Latin American and Latino Studies Department. The lower-division LALS course must be LALS 1; transfer students may petition to replace LALS 1 with an appropriate course from another institution. Upper-division requirements include six core courses: LALS 100, 100A, 100B; Sociology 103B, 105A, and 105B; and four additional elective courses, two from sociology and two from Latin American and Latino studies. At least one of the Latin American and Latino studies upper-division courses must be taught in Spanish or Portuguese\*\*\*,

## Sociology

and at least one course in the sociology/Latin American and Latino studies combined major must be on Chicano/a-Latino/a issues. Up to three relevant courses taken through study abroad programs from which credits are transferable to UCSC may be credited toward the major when the content is deemed appropriate by the faculty advisers of both sociology and Latin American and Latino studies. Students can satisfy the comprehensive requirement in one of three ways: 1) writing a senior thesis; 2) passing an appropriate LALS Senior Seminar (194 series); or 3) completing two additional sociology upper-division courses in the area of Inequality and Social Change (refer to the sociology undergraduate adviser for the specific list of courses). If the thesis option is selected, it should be 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 belongs to both departments.

\*\*\*Upper-division courses in Portuguese are currently not taught at UCSC and must be taken elsewhere.

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### HONORS IN THE MAJOR

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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.

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### REQUIREMENTS OF THE SOCIOLOGY MINOR

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Students minoring in sociology are required to take six courses: one of courses 1, 10, or 15; at least two of courses 103B, 105A, and 105B; and at least three other upper-division sociology courses.

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### REQUIREMENTS OF THE GISES MINOR

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Students minoring in GISES are required to take nine courses (four prescribed lower-division courses in preparation for the minor, four upper-division electives, and a project practicum course). The four lower-division requirements are courses 15, 30A, 30B and 30C. The student's choice of four upper-division electives must be approved either by the student's project adviser or by the director of GISES at the time the minor is declared. Students must take Sociology 196G, Project Practicum, and complete their GISES

capstone project. See description for the project practicum under Requirements for the Intensive Major.

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### UC EDUCATION ABROAD PROGRAM STUDENTS

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**Academic year programs.** Students must declare the major and pass the two lower-division preparatory course requirements (1, 10, or 15) and three of the upper-division core courses (103B, 105A, 105B) prior to study abroad.

**Semester programs.** Fall semester: students must declare the major and pass the two lower-division preparatory course requirements (courses 1, 10, or 15) and one upper-division core course (105A) prior to fall semester study abroad. Spring semester: students must declare the major and pass the two lower-division course requirements (courses 1, 10, or 15) and two upper-division core courses (103B and 105B) prior to spring semester study 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. Up to two relevant courses taken through study abroad programs from which credits are transferable to UCSC may be used toward satisfaction of the major requirements when the content is deemed appropriate and approved by the Sociology Department.

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### TRANSFER STUDENTS

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Junior transfer students expressing an interest in sociology on their UCSC application for admission are admitted as proposed sociology majors. This status is considered undeclared. Transfer students must meet with the sociology undergraduate adviser when they arrive on campus to determine their status and begin the actual declaration of major process, which must be completed by the end of the second quarter of the junior year for transfer students.

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### GRADUATE PROGRAM

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The graduate program in sociology at UCSC leads to both academic and non-academic careers. It distinguishes itself by its interdisciplinary nature. The program is designed to educate students in sociological theory and methods and in the disciplines 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 own course of study. The program leads to a doctor of philosophy (Ph.D.) degree in sociology. A master of arts (M.A.) degree may be taken

## Sociology

en route to the doctorate, but a master's program per se is not available.

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) globalization, political economy, and environment; b) inequality and identity; and c) culture, knowledge, and power. To prepare students to conduct their own research projects, the department trains student in multiple methods—comparative, cultural analysis, ethnography, field research, historical, interpretive, and quantitative techniques.

Faculty specialties include cultural politics; social constructionism; criminology; discourse analysis; emotion/affect; environmental sociology; ethnography; globalization; identity and identity changes; inequality; international development; international law; intersection of class, race, gender, and sexuality; labor studies; language and social interaction; law and society; legal institutions; media; medicine and technology; political economy; popular culture and cultural studies; qualitative methodology; queer studies; racial studies; science and technology studies; sex work/erotic labor; social movements; sociology of drugs; sociology of knowledge; urban sociology; visual sociology; sustainability; environmental justice; and migration.

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, most recently, for example, the National Science Foundation Science and Justice Fellowships.

When asked what they most appreciate about the sociology graduate program, most students cite the students' and faculty's activism and 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 indicating that they have specialized in a specific field in addition to sociology, such as feminist studies, Latin American and Latino 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 Global, International, and Regional Studies; the Center for Labor Studies; the Chicano/Latino Research Center; the Center for Collaborative Research for an Equitable California; the Affect Studies Working Group; the Urban Studies Research Cluster; the Santa Cruz Center for International Economics; and the Interdisciplinary Development 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. Ongoing faculty seminars focusing on concrete research topics are available for advanced graduate students working on papers and dissertations in related areas.

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 serve as teaching assistants for at least three quarters in the department's core classes of the undergraduate curriculum.

The Sociology Department at UCSC is intellectually innovative, both in its interdisciplinary approach and in its commitment to inquiry that is engaged with the world beyond the university.

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## REQUIRED COURSES

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Students are required to take at least 10 courses as follows.

**A three-course core group:**

- 201 The Making of Classical Theory
- 202 Contemporary Sociological Theory
- 203 Sociological Methods

## Sociology

### **Two methods courses:**

204 Methods of Quantitative Analysis\*

and one of the following eight courses:

205 Field Research Methods

206 Comparative Historical Methods

209 Analysis of Cultural Forms

241 Cross-National and Cross-Cultural Research

242 Feminist Research Seminar

268A Science and Justice: Experiments in Collaboration

Sociology 282 Social Policy Research

Psychology 248 Survey Methods

### **Two of three thematic area courses:**

220 Global Transformation: Macrosociological Perspectives

240 Inequality and Identity

260 Culture, Knowledge, Power

A minimum of three elective graduate seminars, one of which may be from outside sociology (excluding Sociology 250 and Sociology 293).

\*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.

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## ELECTIVE COURSES

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208 Writing Practicum

209 Cultural Forms\*

220 Global Transformation\*\*

225 Political Economy for Sociologists

229 Work and Labor Markets in the New Economy

240 Inequality and Identity\*\*

242 Feminist Research Seminar

246 Class, Culture, and Movement

252 Symbolic Interactionism and Sociology of Emotions

256 Urban Sociology

257 Colonialism, International Law, and Global Justice

260 Culture, Knowledge, Power\*\*

263 Cultural Politics of Difference

268A Science and Justice: Experiments in Collaboration\*

268B Science and Justice Research Seminar

290 Special Topics on Social Movements

290 Special Topics on Affect, Emotions, and the Social World

290 Special Topics on Political Emotions

\*Can be taken as an elective if not fulfilling the methods requirement.

\*\*Students are required to take two of the three thematic area courses—220, 240, 260—and the third may count as an elective.

For more information about courses offered in the 2015-16 academic year, please visit:

<http://sociology.ucsc.edu/about/courses/course-catalog.php>

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## PROGRESS TOWARD THE PH.D.

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- Beginning at least by the end of the first year, students initiate work on their master's paper.
- 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.
- 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.
- After passing the qualifying examination, a student advances to candidacy and begins work on the dissertation with the aid of a three-person dissertation committee.
- After the complete dissertation has been submitted to and accepted by the dissertation committee, students must pass an oral dissertation defense.

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, refer to the Graduate Studies section of the catalog.

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## DESIGNATED EMPHASIS IN SOCIOLOGY

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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 adviser; and c) oversee progress in the Designated Emphasis.

## Sociology

**Adviser:** In addition to the student's adviser(s) in their home department, the student must have a faculty adviser 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.

**Courses:** The student must take five (5) Sociology graduate seminar courses:

Two (2) core courses:

SOCY 201 The Making of Classical Theory  
SOCY 202 Contemporary Sociological Theory

One (1) methods course from the following:

SOCY 203 Sociological Methods  
SOCY 204 Methods of Quantitative Analysis  
SOCY 205 Field Research Methods  
SOCY 206 Comparative Historical Methods  
SOCY 209 The Analysis of Cultural Forms  
SOCY 241 Cross-National and Cross Cultural Research  
SOCY 242 Feminist Research Seminar  
SOCY 282 Social Policy Research

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:** 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 adviser will determine whether a particular piece of writing meets the requirement.

Graduate students interested in pursuing the Designated Emphasis in Sociology should contact the Sociology graduate program coordinator.

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## SOCIOLOGY FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**Dane Archer, Emeritus**

**John Brown Childs, Emeritus**

**Ben Crow**

International development, sociology of water and markets, global inequality, South Asia and East Africa, political economy, sustainable development

**E. Melanie DuPuis, Emerita**

**William H. Friedland, Emeritus**

**Hiroshi Fukurai**

Citizen participation in law, race and the law, indigenous approach to international law, decolonialism, Japan and East Asia, advanced quantitative methods, survey research

**Walter L. Goldfrank, Emeritus**

**Herman S. Gray**

Cultural studies, media and television studies, black cultural politics, social theory

**Paul M. Lubeck, Emeritus**

**Dennis C. McElrath, Emeritus**

**Marcia Millman, Emerita**

**James R. O'Connor, Emeritus**

**Jennifer E. Reardon**

Science studies; sociology of science, technology, and medicine; feminist theory;

race/ethnicity/gender/sexuality/class; biology and society

**Craig Reinerman**

Political sociology; law, crime, and social justice; drugs and society

**Pamela Ann Roby, Emerita**

**Dana Y. Takagi**

Social inequality, affect, religion, race, quantitative analysis

**Candace West**

Language and social interaction, sex and gender, conversation analysis

### ASSOCIATE PROFESSOR

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**Julie Bettie**

Cultural theory and popular culture; race, gender, class, and cultural politics; sexuality and sex work; critical qualitative methodologies

**Deborah Gould**

Political emotion; social movements and contentious politics; classic and contemporary social theory; sexualities; lesbian/gay/queer studies; feminist and queer theory

**Miriam Greenberg**

Urban sociology, media studies, cultural studies, political economy, globalization, and urban political ecology

## Sociology

### **Steven McKay**

Work and labor markets; globalization and social change; political sociology; race; masculinity; migration; ethnography/qualitative methods

### **Helen Shapiro**

Political economy, Latin American economic history and development (with an emphasis on Brazil), industrial policy, the auto industry, the state and transnational corporations

### **Veronica Terriquez**

Immigrant incorporation, civic engagement, social inequality, Latinos in the U.S., youth transitions to adulthood, quantitative methods, mixed-methods

ASSISTANT PROFESSOR

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### **Hillary Angelo**

Urban sociology, environmental sociology, social theory, historical sociology

LECTURER

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### **Francesca Guerra**

Social justice, race and ethnicity, poverty, deviance, history of eugenics, disability rights, media, statistics and research methods

### **Wendy Martyna**

Social psychology, death and dying, gender, social change, family and youth, language and society



PROFESSOR

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### **Barbara L. Epstein, Emerita (History of Consciousness)**

### **Julie Guthman (Social Sciences)**

Sustainable agriculture and alternative food movements, California agriculture, international political economy of food and agriculture, politics of obesity, political ecology, race and food, epigenetics and environmental health, critical nutrition, critical human geography

### **Nancy Stoller, Emerita (Community Studies)**

### **Andrew Szasz (Environmental Studies)**

Environmental sociology (environmental movements, policy, environmental justice); theory

### **Mark Traugott, Emeritus (History)**

### **David Wellman, Emeritus (Community Studies)**

ASSISTANT PROFESSOR

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### **Sylvanna Falcón (Latin American and Latino Studies)**

Human rights, racism/antiracism, globalization, gender, transnational feminism, Latin America (Mexico, Peru), United States

### **Jessica Taft (Latin American and Latino Studies)**

Youth activism; childhood and youth studies; social movements; participatory democracy; girls studies; Latin American radicalisms; feminist theory; qualitative and participatory research methods

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## SOCIOLOGY COURSES

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### LOWER-DIVISION COURSES

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#### **1. Introduction to Sociology. F,S**

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.

(General Education Code(s): IS.)

The Staff

#### **10. Issues and Problems in American Society. W**

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. (General Education Code(s): IS.) D. Gould

#### **15. World Society. F**

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. (General Education Code(s): CC, IS, E.) S. Mc Kay

#### **30A. Introduction to Global Information and Social Enterprise Studies (3 credits). F**

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.

## Sociology

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. Enrollment limited to 50. The Staff

### **30B. Designing ICT Projects for Social Enterprise (3 credits). W**

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. Enrollment limited to 50. The Staff

### **30C. Project Implementation and Grant Writing for Social Entrepreneurs (3 credits). S**

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. Enrollment limited to 50. The Staff

### **42. Student-Directed Seminar. F,W,S**

Seminars on selected topics taught at various times by upper-division students under faculty supervision. (See course 192.) Consult the Schedule of Classes for specific offerings. The Staff

### **93. Field Study. F,W,S**

Ordinarily call numbers for this course will not be issued after the first week of instruction. Students submit petition to sponsoring agency. The Staff

### **99. Tutorial. F,W,S**

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. May be repeated for credit. The Staff

### **99F. Tutorial (2 credits). F,W,S**

Directed reading and research. Petitions may be obtained from the Sociology Department Office. Students submit petition to sponsoring agency. Ordinarily call numbers for this course are not issued after the first week of instruction. May be repeated for credit. The Staff

## **UPPER-DIVISION COURSES**

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### **103A. Statistical Methods. W**

Fundamental concepts in statistics. Introduction to measuring causation. Learn to use computer to analyze data efficiently. Emphasis on practical applications. Enrollment restricted to sociology, proposed sociology, and combined sociology majors. (General Education Code(s): SR, Q.) D. Takagi

### **103B. The Logic and Methods of Social Inquiry. S**

The first part of the course focuses on basic ethical, political, and logical issues in social scientific inquiry. The second part develops a wide range of skills and methods appropriate to actual research. Course 103A, Statistical Methods, is strongly recommended. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements;

enrollment restricted to sociology and sociology combined majors, minors and proposed majors. (General Education Code(s): W, Q.) F. Guerra

### **105A. Classical Social Theory. F**

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. Required for sociology majors planning on studying abroad (EAP). (Formerly Classical Sociological Theory.) Enrollment restricted to juniors and seniors in sociology, proposed sociology, the combined Latin American and Latino studies/sociology, and the proposed combined Latin American and Latino studies/sociology majors and sociology minors. M. Greenberg

### **105B. Contemporary Social Theory. W**

Surveys major theoretical perspectives currently available in the discipline including functionalism, symbolic interactionism, ethnomethodology, conflict theory, critical theory, neo-Marxism, feminist theory. (Formerly Contemporary Sociological Theory.) Enrollment restricted to juniors and seniors in sociology, proposed sociology, the combined Latin American and Latino studies/sociology, and the proposed combined Latin American and Latino studies/sociology majors and sociology minors. J. Klett

**111. Family and Society. F**

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. Enrollment is restricted to juniors and seniors. W. Martyna

**114. Sports and Society. \***

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. The Staff

**115. Green Governance. \***

Working collaboratively in group interactive laboratories, students assess the effectiveness of various forms of public and private decision-making in the creation of a sustainable future. Electrical Engineering 80S or the College Eight core course recommended as prerequisites. (Formerly Sustainable Design as Social Change.) Enrollment limited to 60. (General Education Code(s): PE-T.) The Staff

**116. Communication, Media, and Culture. F**

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. (Formerly "Communication and Mass Media.") Prerequisite(s): courses 105A and 105B. Enrollment restricted to junior and senior majors, and minors in sociology, global

information and social enterprise, and Latin American studies/sociology combined majors. J. Klett

**118. Popular Music, Social Practices, and Cultural Politics. S**

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(s): course 105A or 105B. Enrollment restricted to juniors and seniors. J. Klett

**119. Sociology of Knowledge. W**

Focus includes the following three areas: historical examination of sociological theories of knowledge with reference to Durkheim, Weber, Mannheim, and others; examination of black and feminist perspectives within sociology; examination of whether and how "outside" observers can analytically grasp the inner workings of other cultures. Prerequisite(s): course 103B or 105A or 105B. H. Angelo

**120. Gender, Sexuality, and Cultural Politics. \***

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 Feminisms and Cultural Politics.)

Prerequisite(s): course 126 is recommended. Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, feminist studies, global information and enterprise, and Latin America/social studies combined. J. Bettie

**121. Sociology of Health and Medicine. S**

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. Enrollment is restricted to junior and senior majors and minors in biochemistry, biological sciences, critical race and ethnic studies, and sociology, and the Latin American studies/sociology combined majors. J. Reardon

**122. The Sociology of Law. \***

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. (Also offered as Legal Studies 122. Students cannot receive credit for both courses.) Enrollment is restricted to majors and minors in legal studies, sociology, Latin American/sociology combined, and global information and social enterprise. C. Reinerman

**123. Law, Crime, and Social Justice. F**

Blends the latest research in criminology with that from social stratification, inequality, and social

## Sociology

welfare policy with the objective of exploring the relationship between levels of general social justice and specific patterns of crime and punishment. The focus is primarily on the U.S. although many other industrialized democracies are compared. An introductory course in sociology is recommended as preparation. (Also offered as Legal Studies 123. Students cannot receive credit for both courses.) F. Guerra

### **124. Visual Sociology. \***

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. (Formerly Visual Ethnography) Prerequisite(s): Enrollment restricted to juniors and seniors. J. Bettie

### **124L. Visual Sociology Media Lab (2 credits). \***

Teaches the basics of digital narrative/storytelling, basic use of digital video cameras, digital video editing in iMovie and/or Final Cut Pro, and use of microphones and sound. Students use these skills to aid in creation of their final course project. (Formerly Visual Ethnography Media Lab.) Concurrent enrollment in course 124 is required. Enrollment restricted to juniors and seniors. J. Bettie

### **125. Society and Nature. W**

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. 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, (General Education Code(s): PE-E.) A. Szasz

### **126. Sociology of Sex. F**

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. Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, feminist studies, Latin American/sociology combined, and global information and social enterprise. Enrollment limited to 90. J. Bettie

### **127. Drugs in Society. \***

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. (Also offered as Legal Studies 127. Students cannot receive credit for both courses.) Enrollment is restricted to majors and minors in legal studies, sociology, Latin American/sociology combined, and global information and social enterprise. The Staff

### **128. Law and Politics in Contemporary Japan and East Asian Societies. \***

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. (Also offered as Legal Studies 126. Students cannot receive credit for both courses.) 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. Enrollment limited to 30. H. Fukurai

### **128I. Race and Law. F**

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) (Also offered as Legal Studies 128I. Students cannot receive credit for both courses.) 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. H. Fukurai

**128J. The World Jury on Trial. \***

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. (Also offered as Legal Studies 128J. Students cannot receive credit for both courses.) 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. Enrollment limited to 30. H. Fukurai

**128M. International Law and Global Justice. W**

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. (Also offered as Legal Studies 128M. Students cannot receive credit for both courses.) 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. Enrollment limited to 30. H. Fukurai

**129. Popular Culture and Cultural Studies. S**

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. (Formerly Popular Culture.) Prerequisite(s): course 105A or 105B. Enrollment restricted to junior and senior majors and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined. The Staff

**130. Sociology of Food. \***

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. Enrollment restricted to juniors and seniors. Enrollment restricted to sociology majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined majors. Enrollment limited to 60. The Staff

**131. Media, Marketing, and Culture. \***

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. (Formerly Culture, Economy, and Power.) 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. M. Greenberg

**132. Sociology of Science and Technology. \***

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. Enrollment is restricted to junior and senior majors and minors in sociology, biology, biochemistry, critical race and ethnic studies, global information and social enterprise, and Latin American studies/sociology combined. Enrollment limited to 20. J. Reardon

**133. Currents in African American Cultural Politics. \***

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. Enrollment restricted to juniors and seniors. (General Education Code(s): E.) H. Gray

**134. Television and the Nation. W**

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(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to juniors and seniors. (General Education Code(s): W.) H. Gray

**136. Social Psychology. W**

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. Enrollment restricted to junior and senior sociology majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined. Enrollment limited to 218. (General Education Code(s): PE-H.) W. Martyna

**137. Deviance and Conformity. W**

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. 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. Enrollment limited to 68. (General Education Code(s): PE-H.) F. Guerra

**139. Field Research Methods. \***

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(s): course 103B. Enrollment limited to 20. The Staff

**140. Social Psychology of Power. W**

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(s): course 1, 10, or 15 or Psychology 40. Enrollment restricted to juniors and seniors. G. Domhoff

**141. Group Process. \***

The study of group development and interpersonal behavior based primarily on observation of the class discussion group. Readings are drawn from psychology and fiction as well as from sociology. Offered in alternate academic years. Enrollment restricted to senior sociology majors. Enrollment limited to 18. The Staff

**142. Language and Social Interaction. W**

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. Enrollment 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. Enrollment limited to 57. W. Martyna

**143. Conversation Analysis. S**

A working seminar, involving the analysis of actual conversations. Covers fundamental ethical, conceptual, and methodological issues that arise in the collection of conversational data, as well as the skills and techniques of conversation analysis. Given our operating assumption, that talk is a primary means of constructing social identities, there is a heavy thematic emphasis on gender, status, and power in conversation. Prerequisite(s): course 142 or by permission of instructor. Enrollment restricted to juniors and seniors. Enrollment limited to 20. C. West

**144. Sociology of Women. F**

Analysis of the social significance and social production of gender. Some consideration of how sex differences have developed. Major emphasis on the impact of gender as a categorical imperative in the present social context. In this context, the course is also about sexual segregation, sexual inequality, and the dynamics of interpersonal power. Enrollment is restricted to junior and senior majors, proposed majors, and minors in sociology, feminist studies, global information and

## Sociology

enterprise, and Latin American studies/sociology combined, C. West

### **145. Sociology of Men. \***

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. Enrollment 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. The Staff

### **146. Sociology of Violence, War, and Peace. \***

Explores key issues, theories, and topics in the study of violence, war, and peace. Addresses aspects of aggression, personal violence, political violence, and war. In addition, various strategies for the prevention of violence and war are examined. The Staff

### **149. Sex and Gender. W**

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. Enrollment restricted to junior and senior majors, proposed majors, and minors in sociology, global information and social enterprise,

and Latin American studies/sociology combined majors. C. West

### **150. Sociology of Death and Dying. S**

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. Enrollment restricted to juniors and seniors. W. Martyna

### **152. Body and Society. F**

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(s): course 105A or course 105B.

Enrollment is restricted to junior and senior majors and minors in sociology, global information and enterprise, and Latin American studies/sociology combined. Enrollment limited to 50. F. Guerra

### **153. Sociology of Emotions. F**

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. Enrollment restricted to junior and senior majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American

studies/sociology combined majors. W. Martyna

### **154. Cross-National and Cross-Cultural Research. \***

Examines a variety of theoretical, methodological, and substantive approaches to cross-national and cross-cultural research. Focuses on the importance and variety of cross-national and cross-cultural studies. Prerequisite(s): course 103B. Enrollment limited to 20. The Staff

### **155. Political Consciousness. \***

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. G. Domhoff

### **156. U.S. Latina/o Identities: Centers and Margins. W**

Explores historical and contemporary constructions of Latina/o identities and experiences in U.S. Particular emphasis placed on transcultural social contexts, racial formations, and intersections with other identities including sexuality and gender. 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, Enrollment limited to 50. (General Education Code(s): ER, E.) V. Terriquez

### **157. Sexualities and Society. F**

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

## Sociology

stake in these debates. Enrollment 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. Enrollment limited to 30. D. Gould

### **158. Politics of Sex Work and Erotic Labor. \***

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(s): courses 120 and 126. Enrollment 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. J. Bettie

### **159. Latinos and Population Change. \***

Examines key theories of demographics change (fertility, mortality, and migration) in important policy issues, such as the aging of America, racial categorization, and immigration. Explores political and economic factors that have led to the changing face of the U.S. over the last century and key legislative changes that have changed the experience of immigrants. Students use primary demographic data from the U.S. Census Bureau and learn basic tools for demographic data access and presentation. (Formerly Latin American and Latino Studies 163.) (Also offered as Latin American&Latino Studies 159.

Students cannot receive credit for both courses.) Prerequisite(s): course 100A or Sociology 103A or Sociology 105A, or by permission of instructor. Enrollment restricted to sophomores, juniors, and seniors. (General Education Code(s): PE-H, E.) The Staff

### **160. Project Homeless Connect: The Integration of Theory and Practice. \***

Discusses concepts of social research, development, and culture as they relate to homelessness at both the local and global level. Themes include: the existence of power and resistance in society and the mechanism for social reproduction and change. Enrollment by interview only. Enrollment restricted to juniors and seniors. Enrollment limited to 20. The Staff

### **162. Dutch Society. \***

Reviews Dutch history from its religious wars, Golden Age colonial conquests, and state formation through the Nazi occupation, 1960's revolts, and the assassinations after 2000. Focuses on the rise of the Netherlands' famed culture of tolerance and its fall in the face of Islamic immigration. Enrollment limited to 30. (General Education Code(s): CC.) C. Reinerman

### **163. Global Corporations and National States. \***

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(s): course 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. H. Shapiro

### **164. Capitalism and Its Critics. \***

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 intersection with capitalism? Is resistance desirable and/or possible? Enrollment 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. (General Education Code(s): TA.) D. Gould

### **164T. Marx and Marxist Theory. \***

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. (Formerly Social Theory and the Marxian Tradition.) Prerequisite(s): course 105A or consent of instructor. D. Gould, B. Crow

### **165. World Systems Perspective. \***

Seminar on the intellectual origins and contemporary exponents of the world-systems perspective in the social sciences: Marx, Braudel, Polanyi, Arrighi, Wallerstein. Prerequisite(s): courses 105A and 105B or permission of instructor. The Staff

**166. Economics for Non-Economists. \***

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. Enrollment restricted to juniors and seniors. Enrollment limited to 40. H. Shapiro

**167. Development and Underdevelopment. S**

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. Prerequisite(s): course 15. Enrollment restricted to junior and senior majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined majors. B. Crow

**168. Social Justice. S**

What is social justice? People answer this question differently, depending upon their sociological perspective. Using a combination of political philosophy and sociological studies, explore five perspectives on social justice within the Western sociological tradition: utilitarianism, Marxism, liberal egalitarianism, communitarianism, and pluralism. Students pick a topic and learn to articulate different visions of socially just change based on these perspectives. Prerequisite(s): course 105A. Enrollment limited to 60. The Staff

**169. Social Inequality. F**

A survey of theories and systems of social stratification focusing on such phenomena as race, class, power, and prestige. Enrollment restricted to junior and senior sociology and Latin American studies/sociology combined majors. Enrollment limited to 48. (General Education Code(s): E.) D. Takagi

**170. Ethnic and Status Groups. \***

Examines the enduring and changing status of ethnic and other visible minority groups in the United States, e.g., Latinos, Asian Americans, African Americans, and immigrants, with comparative materials drawn from other societies. An introductory course in ethnicity and race is recommended as preparation. Enrollment restricted to sophomore, junior, and senior majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined. Enrollment limited to 50. Satisfies American History and Institutions Requirement. (General Education Code(s): E.) The Staff

**171. Exploring Global Inequality. \***

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. Enrollment restricted to seniors. Enrollment limited to 30. B. Crow

**172. Sociology of Social Movements. F**

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. Enrollment restricted to junior and senior majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined majors. Enrollment limited to 40. (General Education Code(s): PE-H.) D. Gould

**173. Water. S**

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. Enrollment is restricted to junior and senior sociology majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined. Enrollment limited to 60. (General Education Code(s): PE-E.) B. Crow

**174. Twenty-First-Century African American Social Structure. \***

A sociological overview of African American society in the 21st century. The changing patterns of social/cultural organization, class structure, and modes of political action are analyzed. This analysis is located within the framework of migration, urbanization, and social struggle among black Americans. Prerequisite(s): course 10 or 20. (General Education Code(s): E.) The Staff

**176. Women and Work. \***

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. 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. The Staff

**176A. Work and Society. S**

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. Enrollment restricted to junior and senior majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined majors. S. Mc Kay

**177. Urban Sociology. W**

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. 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. Enrollment limited to 60. M. Greenberg

**177A. Latinos/as and the American Global City. S**

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. 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. Enrollment limited to 40. The Staff

**177E. Eco-Metropolis: Research Seminar in Urban and Environmental Studies. W**

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. 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. M. Greenberg

**177G. Global Cities. \***

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.

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. M. Greenberg

**178. Sociology of Social Problems. F**

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(s): courses 105A and 105B. Enrollment is restricted to junior and senior majors and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined. J. Klett

**179. Nature, Poverty, and Progress: Dilemmas of Development and Environment. \***

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(s): course 15. Enrollment restricted to junior and senior majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined majors. B. Crow

**179L. Nature, Poverty, and Progress Laboratory. \***

For enrollees in course 179, this optional lab provides opportunity to research ideas and produce a rough business plan for green enterprise of choice. Examples include compostable packaging, gray water systems, sustainable manufacturing, solar-powered submarines, green consulting, and other enterprises. Concurrent enrollment in course 179 required. Enrollment limited to 20. B. Crow

**180. Social Movements of the 1960s. \***

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. Enrollment restricted to junior and senior majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined majors. Enrollment limited to 45. The Staff

**184. Hunger and Famine. \***

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. 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. B. Crow

**187. Feminist Theory. \***

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(s): course 105B, and either course 144 or 149 or Feminist Studies 1 or 100. Enrollment limited to 35. D. Gould

**188A. Social Change in the Global Economy. \***

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(s): course 15. Enrollment restricted to junior and senior majors, proposed majors, and minors in sociology, global information and social enterprise, and Latin American studies/sociology combined majors. (General Education Code(s): CC.) S. Mc Kay

**190. Proseminar.**

The Staff

**191. Sociology Teaching Practicum. F,W,S**

Under the supervision of the instructor, the student works with a group of students in a lower-division course, leading discussions, explaining material, reading and marking submissions, consulting individually and/or in other ways assisting in the teaching of a course. Interview and selection by professor required. Prerequisite(s): Senior standing and excellent performance in core courses in the major. Enrollment restricted to

senior sociology majors. The Staff  
**192. Directed Student Teaching. F,W,S**

Teaching of a lower-division seminar under faculty supervision. (See course 42.) Students submit petition to sponsoring agency. The Staff

**193. Field Study. F,W,S**

Provides for (department-sponsored) individual field study in the vicinity of the campus under the direct supervision of a faculty sponsor (as opposed to course 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. May be repeated for credit. The Staff  
**193F. Field Study (2 credits). F,W,S**

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. May be repeated for credit. The Staff

**194. Group Tutorial. F,W,S**

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. May be repeated for credit. The Staff

**194F. Group Tutorial (2 credits). F,W,S**

Small group study of a particular topic in consultation with a faculty sponsor. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## Sociology

### **195A. Senior Thesis. F,W,S**

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): course 103B. Students submit petition to sponsoring agency. The Staff

### **195B. Senior Thesis. F,W,S**

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): course 103B. Students submit petition to sponsoring agency. The Staff

### **195C. Senior Thesis. F,W,S**

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): course 103B and satisfaction of the Entry Level Writing and Composition requirements. Students submit petition to sponsoring agency. May be repeated for credit. (General Education Code(s): W.) The Staff

### **196A. Capstone: The Sociologist as Public Intellectual (3 credits). S**

Students hear a selected group of faculty discuss their current research and how that research furthers public understanding and discussion of some vital contemporary social issue. Enrollment restricted to junior and senior sociology majors. J. Bettie

### **196G. Project Practicum: Global Information and Social Enterprise. F,W,S**

Project summary and evaluation are required for completion of minor in global information and social enterprise studies (GISES). Projects require approval in advance by director of GISES. Completed projects must be uploaded electronically on the web site or archive of the global information internship program. Prerequisite(s): courses 30A, 30B, and 30C. May be repeated for credit. The Staff

### **198. Independent Field Study. F,W,S**

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. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

Advanced directed reading and research. Petitions may be obtained from the Sociology Department Office. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S**  
Advanced directed readings and research. Petitions may be obtained from the Sociology Department Office. Students submit petition to sponsoring agency. May be repeated for credit. The Staff  
**GRADUATE COURSES**

### **201. The Making of Classical Theory. F**

Examines the establishment of "theory" in the discipline of sociology. Introduces students to close readings and analysis of a core selection of social theory. Problematizes the construction, maintenance, and reproduction of a theoretical canon in sociology. Enrollment restricted to graduate students in sociology and by permission number. Enrollment limited to 20. M. Greenberg

### **202. Contemporary Sociological Theory. \***

Intensive survey of major tendencies in modern social thought, including functionalism, symbolic interactionism, ethnomethodology, critical theory, structuralism, phenomenology, neo-Marxism, and feminist theory. Enrollment restricted to graduate students in sociology and by permission number. D. Gould

### **203. Sociological Methods. F**

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. Enrollment restricted to graduate students in sociology and by permission number. V. Terriquez

**204. Methods of Quantitative Analysis. W**

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. Enrollment restricted to graduate students in sociology and by permission number. Enrollment limited to 20. H. Fukurai

**205. Field Research Methods. \***

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. Enrollment restricted to graduate students in sociology and by permission number. Enrollment limited to 10. Offered in alternate academic years. The Staff

**206. Comparative Historical Methods. \***

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. Enrollment restricted to graduate students. Enrollment limited to 20. The Staff

**208. Writing Practicum. S**

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. Enrollment restricted to sociology graduate students and by permission number. Enrollment limited to 12. H. Gray

**209. The Analysis of Cultural Forms. S**

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. Enrollment restricted to sociology graduate students. J. Bettie

**220. Global Transformation: Macrosociological Perspectives. W**

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. Enrollment restricted to graduate students in sociology. Enrollment limited to 15. S. Mc Kay

**222. Political Sociology. \***

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. Enrollment restricted to graduate students. The Staff

**223. Sociology of the Environment. \***

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. Enrollment restricted to graduate students. Enrollment limited to 20. May be repeated for credit. The Staff

**224. Globalization: Theories and Social Movements. \***

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. Enrollment restricted to graduate students. Enrollment limited to 25. Offered in alternate academic years. May be repeated for credit. The Staff

**225. Political Economy for Sociologists. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. B. Crow

**227. Learning from Environmental Historians. \***  
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. Enrollment restricted to graduate students. Enrollment limited to 8. The Staff

**229. Work and Labor Markets in the New Economy. \***  
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. Enrollment restricted to graduate students. S. Mc Kay

**230. Theory and Method in the Sociology of Marx. \***  
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. Enrollment restricted to graduate students. Enrollment limited to 12. The Staff

**240. Inequality and Identity. F**  
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. Enrollment restricted to graduate students in sociology. D. Takagi

**241. Cross-National and Cross-Cultural Research. \***  
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. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

**242. Feminist Research Seminar. \***  
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. Enrollment restricted to graduate students. Enrollment limited to 10. The Staff

**244. Race and Ethnicity. \***  
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. Enrollment restricted to graduate students. Enrollment limited to 15. Offered in alternate academic years. The Staff

**245. Feminist Theory. \***  
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. Enrollment restricted to sociology graduate students. Enrollment limited to 12. J. Bettie

**246. Class, Culture, and Movement. \***  
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. Enrollment restricted to graduate students. Enrollment limited to 15. The Staff

**247. Race and Class. \***  
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,

## Sociology

Hispanics, and Asians. Enrollment restricted to sociology graduate students. The Staff

### **249. Feminisms and Cultural Politics. \***

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. Enrollment restricted to graduate students. J. Bettie

### **250. Course Design and Grant-Writing Seminar. \***

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. Enrollment restricted to sociology graduate students. Enrollment limited to 15. The Staff

### **252. Symbolic Interactionism and Sociology of Emotions. \***

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. Enrollment restricted to graduate students. Enrollment limited to 10. The Staff

### **253. Race, Crime, and Justice. \***

An introduction to comparative and historical analyses of relations between race and the criminal justice system. Specific topics include defining race/ethnicity, sentencing disparities, jury nullification, jury selection and decisions, prosecutorial misconduct, government's charging and investigative discretions, and other racially biased law enforcement practices and criminal court processes. Also covers a number of highly publicized trials that involved unmistakable elements of race and racism such as Chin, King, Simpson, and Unabomber cases. Students are also exposed to World Wide Web (Internet) to learn how to do research in the field of criminal justice. Enrollment restricted to graduate students. Enrollment limited to 15. H. Fukurai

### **255. Engaging Cultural Studies. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. J. Bettie

### **256. Urban Sociology. \***

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. Enrollment restricted to graduate students. The Staff

### **257. Colonialism, International Law, and Global Justice. \***

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. Enrollment restricted to graduate students. Enrollment limited to 15. H. Fukurai

### **258. Global Lay Justice Systems and Direct Democracy. \***

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. Enrollment restricted to graduate students. Enrollment limited to 10. H. Fukurai

### **260. Culture, Knowledge, Power. \***

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. Enrollment restricted to sociology graduate students. Enrollment limited to 15. J. Reardon

**261. Sociology of Knowledge. \***

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.). Enrollment restricted to graduate students. Enrollment limited to 20. The Staff

**262. Cultural Practice and Everyday Life. \***

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. Enrollment restricted to graduate students. Enrollment limited to 10. H. Gray

**263. Cultural Politics of Difference. \***

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. Enrollment restricted to graduate students. Enrollment limited to 10. H. Gray

**264. Science, Technology, and Medicine. \***

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. Enrollment restricted to graduate students. J. Reardon

**268A. Science and Justice: Experiments in Collaboration. \***

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 by permission of instructor. Enrollment restricted to graduate students. (Also offered as Anthropology 267A. Students cannot receive credit for both courses.) Enrollment limited to 15. J. Reardon

**268B. Science and Justice Research Seminar. \***

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): Sociology 268A, Biomolecular Engineering 268A, Feminist Studies 268A, or Anthropology 267A. Enrollment by permission of instructor. Enrollment restricted to graduate students. (Also offered as Anthropology 267B. Students cannot receive credit for both courses.) Enrollment limited to 15. The Staff

**282. Social Policy Research. \***

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. Enrollment restricted to graduate students. Enrollment limited to 10. Offered in alternate academic years. The Staff

**290. Advanced Topics in Sociological Analysis. W**

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. D. Gould

**293. Going on the Job Market. \***

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. Enrollment restricted to graduate students. C. West

**294. Writing for Social Scientists. \***

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.

Sociology

Enrollment restricted to graduate students. Enrollment limited to 10. The Staff

**297. Independent Study. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**299. Thesis Research. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/09/15

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# SPANISH AND SPANISH FOR HERITAGE SPEAKERS

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2015-16 General Catalog

Department of Languages and Applied Linguistics

218 Cowell College

(831) 459-2054

<http://language.ucsc.edu>

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## PROGRAM DESCRIPTION

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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 (Spanish 1-6 as well as Spanish for Heritage Speakers 4-6) and upper-division series (Spanish 114, Spanish 140, Spanish 156 and Spanish 150-153 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 select from among several programs that require some coursework in Spanish, including: 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, or a major in global economics.

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### SPANISH

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Students interested in taking Spanish classes are required to take the placement examination (<http://ic.ucsc.edu/test/>) to enroll in the appropriate level. Students finishing a first year of instruction in Spanish (1-2-3) are encouraged to continue on to second-year (intermediate-level) by taking Spanish 4, 5, and 6. First-year students also have the option of enrolling in the accelerated sequence (1A and 1B), which is equivalent to three quarters of language study. Health science and human biology majors have priority enrollment in Spanish 5M, Medical Spanish, but others may enroll if there is space availability. Students are also encouraged to continue with the third-year Spanish 114, Spanish 140, and the Spanish 156 and Spanish 150-153 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

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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 American studies, education, global economics, language studies, and Latin American and Latino studies.

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### CAMPUS LANGUAGE LABORATORIES AND PLACEMENT EXAMS

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Information about these topics can be found under [Department of Languages and Applied Linguistics](#).

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### STUDY ABROAD

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The Office of International Education (OIE) offers programs ranging from four weeks (Summer Session) in Cuernavaca, Mexico to 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 Spanish 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 OIE web site, (<http://oie.ucsc.edu>). For information on credit applied to a particular major, contact the appropriate department.

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## FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**Jorge Aladro Font (Literature)**

Spanish mysticism, theory and historical developments of imagery in the Middle Ages to the baroque period, Renaissance and baroque Hispanic literature, Italian ideas in the Spanish Renaissance, Cervantes

**Julianne Burton-Carvajal, Emerita (Literature)****Norma Klahn, Emerita (Literature)****Lourdes Martínez-Echazábal (Latin American and Latino Studies)**

Latin American and Caribbean literatures; Afro-Latin American literatures, cultures, and societies; found[n]ational narratives; Brazilian literature; literatures of Cuba and the Cuban diaspora, cinema and social change in Cuba; critical race theory, queer literature and cinema in Latin America

**Juan Poblete (Literature)**

Latin(o) American literatures; transnational/global cultures (literature, radio, film); Latin(o) American cultural studies; 19th-century studies; the history of reading practices

### ASSOCIATE PROFESSOR

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**Eve Zyzik**

Second language acquisition, heritage languages, Spanish linguistics, cognitive and usage-based theory, language pedagogy, content-based instruction

### ASSISTANT PROFESSOR

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**Mark Amengual**

Bilingualism and language contact; acoustic phonetics;

sociophonetics; L2 acquisition; language variation and change; Spanish and Romance linguistics

### SENIOR LECTURER

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**Maria Victoria González-Pagani**

Language teaching methodology; Spanish syntax; computer-assisted foreign language learning; Latin American cultural studies, especially women's contributions

### LECTURER

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**Ignacio Aznar, Emeritus****Byron Barahona**

Language acquisition and teaching methodology, Latin American literature and culture

**Carlos Calierno**

Intercultural communication and languages; Latin American culture; history of the conquest, music, art, and cinematography

**Marta Navarro**

Spanish language pedagogy for heritage speakers and non-native speakers; theater; Mexican popular culture

**Ariel Pérez**

Language acquisition and teaching methodology, computer-assisted language learning, teaching language for proficiency, oral proficiency assessment; Latin American current affairs

**Alvaro Romero-Marco**

Spanish literature of the 19th- and 20th-centuries; film, cultural studies

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## SPANISH FOR HERITAGE SPEAKERS COURSES

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### LOWER-DIVISION COURSES

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**4. Spanish for Heritage Speakers.**

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. (Formerly course 61, Spanish for Spanish Speakers.) (General Education Code(s): CC, IH.) The Staff

**5. Spanish for Heritage Speakers.**

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. (Formerly course 62, Spanish for Spanish Speakers.) Prerequisite(s): SPSS 61 or SPHS 4 or by consent of program coordinator. (General Education Code(s): CC, IH.) The Staff

**6. Spanish for Heritage Speakers.**

Deals with orthography, lexicon development, morphology, syntax, and other linguistic topics as

## Spanish and Spanish for Heritage Speakers

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. (Formerly course 63, Spanish for Spanish Speakers.) Prerequisite(s): SPSS 62 or SPHS 5. (General Education Code(s): CC, IH.) The Staff

### **94. Group Tutorial. F,W,S**

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. Enrollment limited to 10. May be repeated for credit. The Staff

### **99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **99F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## UPPER-DIVISION COURSES

### **115. El ensayo lectura, analisis y redaccion.**

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(s): satisfaction of the Entry Level Writing and Composition requirements; Spanish 6, or Spanish for Spanish Speakers 63, or Spanish for Heritage Speakers 6. Enrollment restricted to sophomore, junior, or senior Spanish studies majors. M. Gonzalez Pagani

### **194. Group Tutorial. F,W,S**

Provides a means for a small group of students to study a particular topic in consultation with a faculty sponsor. Enrollment limited to 10. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

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## SPANISH COURSES

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### LOWER-DIVISION COURSES

#### **1. First-Year Spanish.**

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. (Formerly Instruction in the Spanish Language.) Prerequisite(s): Placement into Spanish 1 via the online Spanish Placement Examination. The Staff

#### **1A. Accelerated Beginning Spanish. W**

The first part of a sequence (courses 1A and 1B) that covers

first-year Spanish in two quarters. Taught entirely in Spanish at an accelerated pace. Aimed at developing students' proficiency in speaking, listening, reading, and writing. Prerequisite(s): Placement into Spanish 1 via the online Spanish Placement Examination. The Staff

#### **1B. Accelerated Beginning Spanish. S**

The second part of a sequence (courses 1A and 1B) that covers first-year Spanish in two quarters. Taught entirely in Spanish at an accelerated pace. Aimed at developing students' proficiency in speaking, listening, reading, and writing. Prerequisite(s): course 1A. The Staff

#### **2. First-Year Spanish.**

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. (Formerly Instruction in the Spanish Language.) Prerequisite(s): course 1 or placement into Spanish 2 via the online Spanish Placement Examination. The Staff

#### **3. First-Year Spanish.**

The first-year program is aimed at developing proficiency in Spanish. Listening, speaking, reading, and

## Spanish and Spanish for Heritage Speakers

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. (Formerly Instruction in the Spanish Language.) Prerequisite(s): course 2 or placement into Spanish 3 via the online Spanish Placement Examination. The Staff

### **4. Second-Year Spanish.**

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. (Formerly Intermediate Spanish.) Prerequisite(s): course 1B or 3 or placement into Spanish 4 via the online Spanish Placement Examination. (General Education Code(s): CC, IH.) The Staff

### **5. Second-Year Spanish.**

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. (Formerly Intermediate Spanish.) Prerequisite(s): course 4 or placement into Spanish 5 via the online Spanish Placement Examination. (General Education Code(s): CC, IH.) The Staff

### **5M. Medical Spanish.**

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 the health sciences and human biology majors. Prerequisite(s): Spanish 4; or

Spanish for Spanish Speakers 61 or 62 or 63; or Spanish for Heritage Speakers 4, or 5, or 6, or 125; or placement into Spanish 5 via the online Spanish Placement Examination. Enrollment restricted to health sciences majors. (General Education Code(s): CC, IH.) The Staff

### **6. Second-Year Spanish.**

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. (Formerly Intermediate Spanish.) Prerequisite(s): course 5 or 5M or placement into Spanish 6 via the online Spanish Placement Examination. (General Education Code(s): CC, IH.) The Staff

### **94. Group Tutorial. F,W,S**

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. May be repeated for credit. The Staff

### **99. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **99F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## **UPPER-DIVISION COURSES**

### **105. Introduction to Spanish Studies. W**

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. Satisfies the Modern, Spanish, and World Literature

concentrations; also satisfies the Global distribution requirement. (Also offered as Spanish/Latin Amer/Latino Lit 105. Students cannot receive credit for both courses.) Prerequisite(s): course 6 or Spanish for Heritage Speakers 6 or permission of instructor. (General Education Code(s): ER.) J. Poblete, The Staff

### **114. Advanced Conversation and Composition. W**

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(s): satisfaction of Entry Level Writing and Composition requirements; SPAN 6, or SPAN 56, or SPSS 63, or SPHS 6, or placement into Spanish 114 via the online Spanish Placement Examination The Staff

### **140. Sounds of Spanish. F**

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(s): course 6 or Spanish for Heritage Speakers 6, and Linguistics 50. Enrollment limited to 25. M. Amengual, The Staff

### **150. Topics in Hispanic Linguistics: Introduction to Hispanic Linguistics. W**

Taught in Spanish. Students learn the major properties of the Spanish language from a linguistics perspective. Topics covered include: phonetics/phonology, morphology, and syntax. (Formerly Languages 150.) Prerequisite(s): Linguistics 50; and Spanish 6 or Spanish for Spanish Speakers 63 or Spanish for Heritage Speakers 6 or

equivalent Spanish proficiency. The Staff, M. Amengual, E. Zyzik, M. Gonzalez Pagani

**151. Topics in Hispanic Linguistics: Varieties of Spanish. F**

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. (Formerly Languages 151.) Prerequisite(s): course 150. The Staff, M. Amengual, E. Zyzik, M. Gonzalez Pagani

**152. Topics in Hispanic Linguistics: Spanish in the U.S. \***

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. (Formerly Languages 152.) Prerequisite(s): course 150. Enrollment limited to 30. The Staff, M. Amengual, E. Zyzik, M. Gonzalez Pagani

**153. Topics in Hispanic Linguistics: Spanish as a Second Language.**

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. (Formerly Languages 153.) Prerequisite(s): Spanish 6 or Spanish for Spanish Speakers 63. Enrollment limited to 30. The Staff, M. Amengual, E. Zyzik, M. Gonzalez Pagani

**156. Topics in Hispanic Language and Culture.**

An analytic study of 20th-century Hispanic language and culture as revealed in print and audio visual media. The Staff

**156A. The Language of Latin America Cinema. \***

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(s): Spanish 6 or Spanish 56 or Spanish for Spanish Speakers 63 or Spanish for Heritage Speakers 6 or placement into Spanish 156A via the online Spanish Placement Examination. (General Education Code(s): CC, E.) C. Calierno, The Staff

**156B. The New Latin American Song. \***

Latin American troubadours, and the relationship between music, ideology, and politics; folkloric music and popular song, song as oral history and chronicle, censorship, and other related topics. Songs from Violeta Parra, Victor Jara, Alfredo Zitarrosa, Chico Buarque, Silvio Rodriguez, and Atahualpa Yupanqui, and other participants or precursors of the movement are studied. Works are analyzed for their sociopolitical and cultural contexts. Prerequisite(s): Spanish 6 or Spanish 56 or Spanish for Heritage Speakers 6 or Spanish for Spanish Speakers 63 or placement into Spanish 156B via

the online Spanish Placement Examination. Enrollment limited to 22. M. Gonzalez Pagani

**156E. Spanish Culture. F**

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(s): Spanish 6 or Spanish 56 or Spanish for Spanish Speakers 63 or Spanish for Heritage Speakers 6 or placement into Spanish 156E via the online Spanish Placement Examination. A. Romero, The Staff

**156F. El Humor en Espanol. W**

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(s): Spanish 6 or Spanish 56 or Spanish for Spanish Speakers 63 or Spanish for Heritage Speakers 6 or placement into Spanish 156F via the online Spanish Placement Examination. (General Education Code(s): TA.) M. Gonzalez Pagani, The Staff

**156G. Spanish for the Professions. \***

Taught in Spanish. Students learn vocabulary and expressions as well as pertinent cultural background to understand, speak, read, and write about business and professional situations in connection with the Latino experience. Legal, educational, medical, and business topics are covered. Prerequisite(s): Spanish 6 or Spanish 56 or Spanish for Spanish Speakers 63 or Spanish for Heritage Speakers 6 or placement into Spanish 156G via the online Spanish Placement Examination. (General Education Code(s): ER.) The Staff

**156J. Contemporary Central America. S**

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(s): course 6 or Spanish for Heritage Speakers 6 or Spanish for Spanish Speakers 63 or equivalent Spanish proficiency. (General Education Code(s): CC.) B. Barahona, The Staff

**156M. Mexico and the Southwest. \***

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. (Formerly Spanish for Spanish Speakers 125.) Prerequisite(s): Spanish 6 or Spanish 56 or Spanish for Spanish Speakers 63 or Spanish for Heritage Speakers 6 or placement into Spanish 156M via the online Spanish Placement Examination. (General Education Code(s): CC.) M. Navarro, The Staff

**194. Group Tutorial. F,W,S**  
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. May be repeated for credit. The Staff

**195F. Senior Essay (2 credits). F,W,S**

Concurrent enrollment in an approved upper-division Spanish, languages, or Spanish literature concentration course not used for core or concentration credit satisfies the capstone requirement. Students work with a faculty adviser to complete the senior capstone essay in addition to course requirements for the upper-division course. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to Spanish studies majors only. The Staff

**199. Tutorial. F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# SPANISH STUDIES

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2015-16 General Catalog

Languages and Applied Linguistics

218 Cowell College

(831) 459-2054

<http://language.ucsc.edu>

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## PROGRAM DESCRIPTION

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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 UCSC 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 will 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.

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.

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## PROGRAM LEARNING OUTCOMES

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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

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## STUDY ABROAD

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Spanish studies encourages students to take advantage of the UC Education Abroad Program (EAP). 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. EAP opportunities in Spanish include Argentina, Chile, Mexico, Spain, and Costa Rica.

Students who participate in the EAP may petition to apply up to 5 courses (up to 25 upper-division credits) from EAP toward the major. Petition forms are available in the Language Program Department office.

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## REQUIREMENTS FOR THE MAJOR

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There are a total of 52 credits (including the 2-credit senior exit course) required for the Spanish studies major. See Program Major Requirements below for a breakdown of the credit requirements.

### MAJOR PREREQUISITE FOREIGN LANGUAGE REQUIREMENT

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Six courses in the regular track Spanish 1, 2, 3, 4, 5, 6; or three courses in the Spanish for Heritage Speakers (SPHS) track, SPHS 4, 5, 6; or equivalent proficiency and Linguistics 50, Introduction to Linguistics.

Five required Spanish studies core courses (25 credits total):

- **Literature:** Spanish Literature (LTSP) 102A, From the Conquest to Sor Juana; or LTSP 102B, Romanticism to Modernism (5 credits)
- **Spanish Studies:** Spanish Literature (LTSP) 105/Spanish 105\*, Introduction to Spanish Studies (cross-listed course) (5 credits)
- **Linguistics:** Spanish 150\*, Topics in Hispanic Linguistics: Introduction to Hispanic Linguistics (5 credits)
- **Spanish Language:** Spanish 114, Advanced Conversation and Composition or Spanish for Heritage Speakers 115, El ensayo lectura, analisis y redaccion (5 credits)
- **History:** One history upper-division course in a related field (i.e., History 131, 132, 133, 134A, 134B) (5 credits)
- \*Spanish Literature 105/Spanish 105 and Spanish 150 must be taken prior to enrollment in or in conjunction with concentration courses.

Choice of Concentrations (choose one concentration—3 courses, 15 credits total)

**Languages and Linguistics Track** (three courses): Five-credit Spanish-language courses numbered 100-189, Spanish 199 and Languages 199 (except Spanish 150, Spanish 114 and Spanish Literature 105/Spanish 105) are accepted with the permission of the Spanish studies director (or faculty adviser).

- Spanish 140, Topics in Hispanic Linguistics: The Sounds of Spanish
- Spanish 151, Topics in Hispanic Linguistics: Varieties of Spanish
- Spanish 152, Topics in Hispanic Linguistics: Spanish in the U.S.
- Spanish 153, Topics in Hispanic Linguistics: Spanish as a Second Language
- Spanish 156A, The Language of Latin American Cinema

- Spanish 156B, The New Latin American Song
- Spanish 156C, Latin American Women's Voices
- Spanish 156E, Spanish Culture
- Spanish 156F, Humor in the Spanish Speaking World
- Spanish 156M, Mexico and the Southwest

**Literature and Culture Track** (three courses): Any 5-credit Spanish literature course numbered 100-189, Spanish Literature 195, Spanish Literature 199 (except Spanish Literature 102A, 102B, 105); see below for examples:

- 100A, Spanish Literature: Origins to 18th Century
- 100B, Spanish Literature: Nineteenth and Twentieth Centuries
- 100C, Medieval Spanish Literature
- 117, Spanish Speaking Caribbean
- 130A, Spanish American Prose
- 130D, Latin American testimonio
- 130E, Latin American Poetry
- 130F, U.S. Latino/a Writing in Spanish, English, and Spanglish
- 131A, Mexico
- 131B, Novel of the Mexican Revolution
- 131D, Chile
- 131H, Cuba
- 134C, Fiction and Marginality: The Marginal at the Center
- 134G, Popular Culture in Latin American Narrative
- 134H, African-Latin American Literature
- 134L, Historia de la lectura y los lectores: recepción y consumo cultural en el mundo Latino Americano
- 134M, Modernidad y Literatura: El Boom de la novela latinoamericana
- 134N, El cuento en Hispanoamérica: Variedades estéticas de la literatura breve in America Latina
- 135A, Mexico Through Movies
- 135C, La Globalización en/del Cine Latinoamericano
- 135D, Social Documentary
- 135F, Cine y Literatura
- 135G, Geografías y géneros del cine hispanoparlante
- 150, Introduction to the Golden Age
- 151, Literature and Life in Don Quijote and Other Cervantes Texts
- 152, Spanish Golden Age Theater
- 153, Picaresque Novel

**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 for Spanish Studies), or any upper-division Spanish Literature, Spanish, or languages concentration courses not taken for concentration credit or capstone requirement.

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### CAPSTONE REQUIREMENT

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In their senior year, Spanish studies majors must satisfy the senior exit requirement in one of two ways:

**Option 1.** Successful completion of a senior capstone course (a designated upper-division course taught in Spanish). The senior capstone should be in the student's chosen concentration: language and linguistics (SPAN), or literature and culture (LTSP). Students must have senior standing and have completed at least three out of five core courses. The capstone course is in addition to the three upper-division concentration courses.

**Option 2.** Spanish 195F, Senior Essay: With faculty permission, students can enroll in Spanish 195F, a 2-credit senior exit course taken in conjunction with an upper-division Spanish, Languages or Spanish Literature concentration course not used for core or concentration credit. Students will work with a faculty adviser to complete a senior capstone essay in addition to course requirements for the upper-division course. This combination must be approved by a faculty adviser in Spanish studies.

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### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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The Disciplinary Communication general education requirement (DC requirement) is satisfied by successfully completing Spanish 114 or Spanish for Heritage Speakers 115.

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### DECLARING THE MAJOR IN SPANISH STUDIES

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To qualify for the major in Spanish studies, students must have completed Spanish 4 or Spanish for Heritage Speakers 4 or equivalent with a grade of C or better, or receive a Spanish placement examination result of 50.

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### TRANSFER STUDENTS

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In addition to the required courses to satisfy the campus general education requirements, transfer junior students are strongly advised to complete two years of Spanish language study in accredited two- and four-year institutions. Transfer students who arrive at UCSC with two years of Spanish language preparation should be able to complete the Spanish studies major in normative time. While it is not a condition of admission, students from California community colleges may complete the Intersegmental General Education Transfer Curriculum (IGETC) in preparation for transfer to UC Santa Cruz.

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## SPANISH AND SPANISH FOR HERITAGE SPEAKERS FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**Jorge Aladro Font (Literature)**

Spanish mysticism, theory and historical developments of imagery in the Middle Ages to the baroque period, Renaissance and baroque Hispanic literature, Italian ideas in the Spanish Renaissance, Cervantes

**Norma Klahn, Emerita (Literature)**

**Lourdes Martínez-Echazábal (Latin American and Latino Studies)**

Latin American and Caribbean literatures; Afro-Latin American literatures, cultures, and societies; found[n]ational narratives; Brazilian literature; literatures of Cuba and the Cuban diaspora, cinema and social change in Cuba; critical race theory, queer literature and cinema in Latin America

**Juan Poblete (Literature)**

Latin(o) American literatures; transnational/global cultures (literature, radio, film); Latin(o) American cultural studies; 19th-century studies; the history of reading practices

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### ASSOCIATE PROFESSOR

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**Eve Zyzik**

Second language acquisition, heritage languages, Spanish linguistics, cognitive and usage-based theory, language pedagogy, content-based instruction

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### ASSISTANT PROFESSOR

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**Mark Amengual**

Bilingualism and language contact; acoustic phonetics; sociophonetics; second-language acquisition; language variation and change; Spanish and Romance linguistics

Spanish Studies

SENIOR LECTURER

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**Maria Victoria González-Pagani**

Language teaching methodology; Spanish syntax;  
computer-assisted foreign language learning; Latin  
American cultural studies, especially women's  
contributions

Revised: 09/01/15

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# STEVENSON COLLEGE

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2015-16 General Catalog

College Office

(831) 459-4930

<http://stevenson.ucsc.edu/>

For college description and list of faculty, see [Colleges](#).

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## STEVENSON COLLEGE COURSES

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### LOWER-DIVISION COURSES

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#### **10. Skills for College and Beyond (2 credits). S**

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. Enrollment limited to 15. C. Camblin

#### **16. Stevenson Community Garden (2 credits). \***

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. Enrollment limited to 16. D. Shaw

#### **18. Eighteenth Century Kabbalistic Thought and Literature (2 credits).**

Emphasis on analyzing (translations of) original text to explore critical areas of kabbalistic thought, including tzimtzum, the sefirot, theodicy, and hermeneutics. S. Chein

#### **21. Citizens and Nations: Self and Society in the 19th Century (2 credits). S**

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. Enrollment restricted to Stevenson College members. Enrollment limited to 20. K. Silver

#### **22. Self and Society in Classical Social Theory (2 credits). \***

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. Enrollment restricted to Stevenson College members. Enrollment limited to 20. K. Silver

#### **23. Monsters and the Monstrous in the Early British Novel. S**

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. (General Education Code(s): TA.) S. Sweat

#### **24A. Cultural Intelligence: Developing a Higher CQ (Cultural Intelligence) (2 credits). F**

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.) Enrollment limited to 18. D. Smith

#### **24B. Developing Facilitation Skills for Cultural Intelligence (2 credits). W**

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 by instructor consent. Enrollment restricted to sophomores, juniors, seniors, and graduate students. Enrollment limited to 20. The Staff

**26. Navigating the Research University (2 credits). W,S**

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 Porter 26 or Kresge 26. Enrollment restricted to first-year students. E. Murai

**28. Residential Life Leadership (2 credits). S**

Examines the role and facilitates the development of Stevenson College Residential Advisers. Class themes include an exploration of leadership, resource management, and the process of community building within the college. Course evaluation based on paper writing, participation, engagement with course materials, and a small group final project that requires students to create a year-long program model designed to address an issue facing the Stevenson community. Prerequisite(s): Must have been hired as a Stevenson residential adviser or alternate for the following academic year. Enrollment limited to 30. May be repeated for credit. S. Faulk, B. Redding, The Staff

**30. Thesis Writing and Editing (2 credits). W**

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. Enrollment limited to 25. A. Weaver

**33. Self and Society Examined Through Ethical Dilemmas (2 credits). \***

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. The Staff

**35. Everyday Ethics for College Life (2 credits). \***

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. Enrollment restricted to college members. Enrollment limited to 20. C. Camblin

**36. Women in the Bible (2 credits). \***

Explores and analyzes many of the biblical narratives pertaining to female characters in the Hebrew Bible. Students are required to read the original texts, pose questions, suggest answers, and explore possible meanings of the narrative. Enrollment limited to 10. The Staff

**40. The Self Under Moral Siege: Challenges for the Individual in 20th-Century Totalitarian Europe (2 credits). \***

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. Enrollment priority given to Stevenson College students. Enrollment limited to 22. The Staff

**41. Spirituality in a Modern World (2 credits). \***

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. Enrollment restricted to Stevenson College members. Enrollment limited to 20. C. Camblin

**42. Student-Directed Seminar. F,W,S**

Seminars taught by upper-division students under faculty supervision (see course 192). The Staff

**50A. Stevenson Alumni Careers in Law (2 credits). S**

Online course connecting Stevenson students with alumni who provide practical advice for careers in law. Topics covered include preparing for majors, internships, graduate school, networking, applying for jobs, interviewing, and future employment. Enrollment restricted to Stevenson College members. G. Childers

**50B. Stevenson Alumni Careers in Science and Technology (2 credits). S**

Online course connecting Stevenson students with alumni who provide practical advice for careers in science and technology. Topics covered include preparing for majors, internships, graduate school, networking, applying for jobs, interviewing, and future employment. Enrollment restricted to Stevenson College members. G. Childers

**80A. Introduction to University Discourse: Self and Society. F**

Explores rhetorical principles and conventions of university discourse

providing intensive practice in analytical writing, critical reading, and speaking. Stevenson's core course considers the roots of modern society using foundational religious texts and major classical and modern philosophical works. Students cannot receive credit for this course and course 80B. Enrollment restricted to first-year college members who have not satisfied the C1 requirement. Enrollment limited to 25. (General Education Code(s): T5-Humanities and Arts or Social Sciences, C1.) The Staff

**80B. Rhetoric and Inquiry: Self and Society. F**

Explores the intersections of investigation, interpretation, and persuasion and hones strategies for writing and research. Stevenson's core course investigates the roots of modern society, using foundational religious texts and classical and modern philosophical works. Students cannot receive credit for this course and course 80A. Prerequisite(s): satisfaction of the Entry Level Writing and C1 requirements. Enrollment restricted to first-year college members. Enrollment limited to 25. (General Education Code(s): T5-Humanities and Arts or Social Sciences, C2.) The Staff

**80F. Academic Success in the College Core Course (3 credits). F**

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. Enrollment limited to 25. C. Camblin

**80G. Self and Society Through Film (2 credits).**

Seminar designed to expand upon the discussions begun in the Stevenson Core Course. Course uses documentary and feature films to investigate and discuss all sides of modern conflicts that bring class back to the Core Course theme. (Formerly course 80F). Prerequisite(s): completion of two-quarter core course sequence. Enrollment limited to 25. The Staff

**80H. Rainbow Theater: An Introduction to Multicultural Theater. F**

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. May be repeated for credit. (General Education Code(s): T4-Humanities and Arts, E.) D. Williams

**80T. Self and Society for Transfer Students. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to college members. Enrollment limited to 25. (General Education Code(s): T5-

Humanities and Arts or Social Sciences, W, E.) The Staff

**81A. Self and Society 2. W**

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. Enrollment restricted to first-year and sophomore college members. Students cannot receive credit for this course and course 81B. Enrollment limited to 25. (General Education Code(s): TA, E.) The Staff

**81B. Rhetoric and Inquiry: Self and Society 2. W**

Explores the intersections of investigation, interpretation, and persuasion and hones strategies for writing and research. Winter quarter of Stevenson's core course investigates themes of colonization, race, gender, class, and cultural conflict. Permission of instructor required; selection for this course based on application submitted. Prerequisite(s): satisfaction of the Entry Level Writing and C1 requirements. Enrollment restricted to first-year and sophomore college members. Students cannot receive credit for this course and course 81A. Enrollment limited to 25. (General Education Code(s): TA, C2, E.) The Staff

**90. The Nuclear Pacific. S**

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. Enrollment is restricted to first-year, Challenge Program participants from Stevenson College, Merrill College,

Porter College, and Kresge College. Enrollment limited to 25. Satisfies American History and Institutions Requirement. (General Education Code(s): PE-T.) A. Yang

**91F. Challenge Speakers Colloquium (2 credits). F**

Eight lectures, six by faculty about research problems in their disciplines. Students attend two dinners with the speakers; respond to research papers in each speaker's field; conduct a research interview with a professor; and investigate a research question. (Also offered as Porter College 91F. Students cannot receive credit for both courses.) Prerequisite(s): course 90, or Merrill 90, or Kresge 90A, or Porter 90A. Enrollment restricted to college members. E. Abrams

**96. Theory and Practice of Peer-Guided Learning for Tutors and Learning Assistants (2 credits). F,W**

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. (Formerly Education 96.) H. Gritsch De Cordova

UPPER-DIVISION COURSES

**120. Self and Society: Teaching Practicum. W**

Each student facilitates one of the discussion sections of Stevenson 81A or attends lectures, and meets with staff for practicum on the teaching process. Prerequisite(s): qualifications as determined by instructor at first class meeting. Enrollment limited to 5. The Staff

**121. Advanced Research and Strategic Planning for Graduate School. W**

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. Enrollment limited to 20. The Staff

**192. Directed Student Teaching. F,W,S**

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. The Staff

**193. Field Study. F,W,S**

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. May be repeated for credit. The Staff

**194. Group Tutorial. F,W,S**

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. The Staff

**194F. Group Tutorial (2 credits). F,W,S**

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. May be repeated for credit. The Staff

**198. Independent Field Study. F,W,S**

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. May be repeated for credit. The Staff

**198F. Independent Field Study (2 credits). F,W,S**

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. May be repeated for credit. The Staff

**199. Tutorial. F,W,S**

Individual projects carried out under the supervision of a Stevenson faculty member. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

Stevenson College

**199F. Tutorial (2 credits). F,W,S**

Individual projects carried out under the supervision of a Stevenson faculty member. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# SUSTAINABILITY STUDIES

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2015-16 General Catalog

College Eight Office

(831) 459-2361

<http://eight.ucsc.edu/>

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## PROGRAM DESCRIPTION

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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, and food. 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 is administered by College Eight and is designed to foster both analytical ability and provide necessary learning.

The pedagogical underpinnings of this minor are premised on relationships between classroom learning, service learning, 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 UCSC divisions (drawing on but **outside** of the divisional structure); 2) teach and train students in the **ecology and sustainability** of design and application in the **built environment**, and the use of STEM skills and social science knowledge to these ends; and 3) meet undergraduate demand for a sustainability curriculum with focuses distinct from those offered in existing UCSC departments.

Program learning objectives are as follows:

- Students will understand the causes, features, data, complexities, policies, and practices giving rise to and needed to address the contemporary global socioecological crisis; the role of production, consumption, politics, policies, markets and behavior in this crisis; and options and alternatives for moving toward and achieving sustainability.

- Students will learn basic **applied** Science, Technology, Engineering, and Mathematics (STEM) skills needed for dealing with real-world applications including assessments, measurements, technologies, behavior, and other factors related to the first objective (above).
- Students will become cognizant of appropriate social science knowledge and methods needed to design and implement social enterprise and service learning projects in sustainability and ecological design and practice.
- Students will design and conduct interdisciplinary 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.
- 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.

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## REQUIREMENTS OF THE MINOR

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Two lower-division courses:

Electrical Engineering 80S, Sustainability Engineering and Design

and one of the following:

- College Eight 81B/Earth and Planetary Sciences 81B, Fundamentals of Environmental Science
- College Eight 81C/EE 81C, Designing a Sustainable Future
- Physics 2, Elementary Physics of Energy
- Electrical Engineering 80J, Renewable Energy Sources

Environmental studies majors may substitute one of the following for the second lower-division course requirement: Environmental Studies 23, 24 or 25.

Service-learning sustainability internship (three, 2-credit courses required), one quarter of College Eight

## Sustainability Studies

55, Introduction to Service Learning for Sustainability, and two quarters of College Eight 155, College Eight Sustainability Internship.

Sustainability research and green enterprise practicum (three, 2-credit courses required), one quarter each of College Eight 150A, Sustainability Praxis in the Built Environment

College Eight 150B, Tools of the Trade

College Eight 150C, Green Enterprise and Social Entrepreneurship

Education for Sustainable Living Program, one quarter of College Eight 161, Education for Sustainable Living (5-credit section)

Upper-division courses, either

Electrical Engineering 122A, B, C, Impact Designs: Engineering and Sustainability through Student Service (all three quarters)

or

Two breadth electives from the list below

- Anthropology 110K, Culture Through Food (W)
- Anthropology 111, Human Ecology (S)
- Anthropology 135A, Cities
- Anthropology 137, Consuming Culture
- Anthropology 146, Anthropology and the Environment (W)
- Anthropology 160, Reproductive and Population Politics
- Anthropology 161, The Anthropology of Food
- Art, 125, Environmental Art Studio (W)
- College Ten 105, The Making and Influencing of Environmental Policy
- Community Studies 133, Making California: Landscapes, People Politics, Economy
- Community Studies 149, Political Economy of Food and Agriculture
- Community Studies 162, Community Gardens and Social Change
- Community Studies 186, Agriculture, Food, and Social Justice (S)
- Earth and Planetary Sciences 107, Remote Sensing of the Environment (W)
- Earth and Planetary Sciences 116, Hydrology (S)
- Earth and Planetary Sciences 121, The Atmosphere (W)
- Earth and Planetary Sciences 142, Engineering Geology for Environmental Scientists (F)
- Earth and Planetary Sciences 146, Ground Water
- Earth and Planetary Sciences 191, Climate Change Science and Policy (S)
- Ecology and Evolutionary Biology 107, Ecology (W,S)
- Ecology and Evolutionary Biology 108, Marine Ecology (W)
- Ecology and Evolutionary Biology 145, Plant Ecology (F)
- Ecology and Evolutionary Biology 147, Community Ecology (S)
- Ecology and Evolutionary Biology 155, Freshwater Ecology (F)
- Economics 170, Environmental Economics (F)
- Economics 171, Natural Resource Economics
- Economics 175, Energy Economics (S)
- Electrical Engineering 175/L, Energy Generation and Control (S)
- Electrical Engineering 176/L, Energy Conservation and Control (F)
- Electrical Engineering 177/L, Power Electronics (W)
- Electrical Engineering 180J, Advanced Renewable Energy Sources (S)
- Feminist Studies 124, Technology, Science, and Race Across the Americas (F)
- Feminist Studies 133, Science and the Body
- History 101C, Oceans in World History (F)
- History 177, Smoke, Smallpox, and the Sublime (F)
- History 196F, European Environmental History
- History of Art and Visual Culture 141I, Environments, Installations, and Sites
- History of Art and Visual Culture 141K, Activist Art Since 1960: Art, Technology, Activism (F)
- History of Art and Visual Culture 143B, History of Urban Design
- History of Consciousness 139A, Market Crises and the Future of Capitalism (F)
- Latin American and Latino Studies 152, Consumer Cultures Between the Americas (F)
- Latin American and Latino Studies 164, Environmental Justice
- Legal Studies 131, Wildlife, Wilderness, and the Law
- Legal Studies 132, California Water Law and Policy (W)
- Legal Studies 137, International Environmental Law and Policy
- Legal Studies 149, Environmental Law and Policy (S)
- Legal Studies 159, Property and the Law (F)
- Microbiology and Environmental Toxicology 101, Sources and Fates of Pollutants (S)
- Microbiology and Environmental Toxicology 144, Groundwater Contamination (S)
- Ocean Sciences 101, The Marine Environment(W)

## Sustainability Studies

- Ocean Sciences 102, Oceans and Climate
- Politics 174, Political Economy of Global Energy, Environment, and Resources
- Psychology 159E, Peace Psychology (F,W)
- Sociology 115, Green Governance
- Sociology 125, Society and Nature (F)
- Sociology 130, Sociology of Food
- Sociology 132, Sociology of Science and Technology (S)

- Sociology 167, Development and Underdevelopment (W)
- Sociology 173, Water
- Sociology 177G, Global Cities
- Sociology 179, Nature, Poverty, and Progress

Substitutes for any of the required classes must be approved by the Program Director. For more information, see [http://eight.ucsc.edu/academic-programs/Minor in Sustainability Studies.html](http://eight.ucsc.edu/academic-programs/Minor%20in%20Sustainability%20Studies.html).

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## SUSTAINABILITY STUDIES FACULTY AND PROFESSIONAL INTERESTS

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**Kevin Bell**, Lecturer, College Eight  
Energy policy, electrical utilities and power systems, public policy, regulation

**Sue A. Carter**, Professor of Physics  
Experimental condensed matter physics, polymer physics, molecular electronics, phase transitions, electronic and optical properties of materials

**Patrick Y. Chuang**, Associate Professor of Earth and Planetary Science  
Clouds, aerosols and climate

**Lindsey Collins**, Lecturer, College Eight/Porter Colleges

**Ben Crow**, Professor of Sociology  
International development, sociology of water and markets, global inequality, South Asia and East Africa, political economy, and green enterprise

**Andrew Fisher**, Professor of Earth & Planetary Science  
Hydrogeology, crustal studies, coupled flows, modeling

**Laurel Fox**, Professor of Ecology and Evolutionary Biology  
Terrestrial population and community ecology, plant-animal interactions

**Julie Guthman**, Professor of Social Sciences  
Sustainable agriculture and alternative food movements, international political economy of food and agriculture, politics of obesity, political ecology, race and food, epigenetics and environmental health, critical human geography

**Michael Isaacson**, Professor of Electrical Engineering  
Nano- and microfabrication technology and applications to biomedical and diagnostic devices, nanocharacterization of materials with emphasis on the development of microscopy tools, novel modes of imaging, electron and light optics, renewable energy systems, STEM education

**Ronnie D. Lipschutz**, Professor of Politics and Provost of College Eight

International relations; global political economy; globalization; foreign policy; resource/environmental politics; global political networks; global civil society and social movements; popular culture and politics; technology and society; risk society, state transformation and global governmentality

**Flora Lu**, Associate Professor of Environmental Studies  
Ecological anthropology, indigenous resource management and household economics, conservation, market integration, environmental justice, Amazon rainforest, Ecuador

**Katie Monsen**, Lecturer in Environmental Studies and Electrical Engineering  
sustainable agroecosystems, nutrient dynamics, and freshwater ecology, sustainability engineering

**Ingrid Parker**, Professor of Ecology and Evolutionary Biology  
Plant ecology, plant-pathogen interactions, biological invasions

## Sustainability Studies

**Daniel Press**, Professor of Environmental Studies  
U.S. environmental politics and policy, water quality,  
industrial ecology, resources management, policy  
analysis

**Thomas Rettenwender**, Lecturer, College Eight  
LEED AP, architect, sustainable design

**Elizabeth Stephens**, Professor of Art  
Intermedia, electronic art, sculpture, and performance  
art

**Andrew Szasz**, Professor of Environmental Studies  
environmental sociology, environmental movements,  
policy, environmental justice, sociological theory

**Susan Watrous**, Lecturer, College  
Eight/Kresge College  
Print adviser, student media

Revised: 09/01/15

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# THEATER ARTS

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2015-16 General Catalog

J106 Theater Arts Center

(831) 459-2974

[theater@ucsc.edu](mailto:theater@ucsc.edu)

<http://theater.ucsc.edu/>

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## PROGRAM DESCRIPTION

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The Theater Arts 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 with equal courage, we educate our students in the history, theory, and practice of theater 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 with a commitment to cultural diversity, we serve the research mission of UCSC, our audiences, and the students who will shape the theater of the future.

The Theater Arts 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 concentrations 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 integrated into the curriculum, especially with respect to dance and design.

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 annual festivals of student work.

Although majors are given preference in studio courses, most courses and productions welcome nonmajors 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 this 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, and dance studios; costume, scene, and properties shops; a sound recording room; and a computer lab.

Elsewhere on campus are the open-air Quarry Theater seating 3,000, the Sinsheimer-Stanley Festival Glen, and the 150-seat Barn Theater. Library holdings in theater literature and history are extensive, including a large slide collection and dance video holdings; journals in current theater, design/technology, and dance; and recordings, films, videotapes, and CD-ROMs.

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## PROGRAM LEARNING OUTCOMES

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Our program incorporates 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:

**Foundations of Performance.** Students should be able to identify and apply basic theatrical techniques in dance, design, and drama.

**Theatrical histories and theories.** Students should be able to recognize and analyze performance works within the general culture and historical period that produced them.

**Performance experience.** Students should be able to translate theater arts concepts into performance, participating in any theatrical endeavor with the rigor,

## Theater Arts

discipline, and imagination necessary to make a meaningful contribution.

**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 concentration.

**Creative practice.** Students should be able to use theatrical practices and performance experiences to conceive, design, realize, and reflect on new performance projects.

**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.

**Communication and critical thinking.** Students should be able to use critical vocabularies to communicate clearly about theater arts in written and oral forms.

**Collaborative skills.** Students should be able to work confidently and effectively in groups on a common project.

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### REQUIREMENTS TO DECLARE THE MAJOR

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Prior to petitioning for the major, students must have successfully completed three lower division courses: one course from Theater Arts 61A, B, or C, and two courses chosen from Theater Arts 10, 20, or 30. Students are encouraged to complete these courses as early in their studies as possible so that the petition to major status can be accomplished no later than the end of sophomore year.

#### TRANSFER STUDENTS

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Transfer students who have not satisfied the requirements to declare the major are advised to take as many of the six lower-division requirements listed above as possible in their first two quarters. Transfer students may petition to have equivalent lower-division courses taken at other schools count toward the lower-division major requirements. Petition forms and information on courses and major requirements can be obtained at the department office, J106 Theater Arts Center.

#### MAJOR REQUIREMENTS

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The Theater Arts major requires seven lower-division courses, six credits of course 50, and eight upper-division courses (inclusive of a senior seminar project). Majors may organize their studies around a concentration in an area of interest in accordance with

the requirements outlined below. The following six lower-division courses must be taken by all majors:

10, Introduction to Theater Design and Technology

20, Introductory Studies in Acting

30, Introduction to Dance Theory and Technique

61A, Ancient and Medieval Drama

61B, Drama from the Renaissance to the Modern Age

61C, Birth of the Modern: After the Renaissance

One additional lower-division 5-credit elective.

Plus: 50, Fundamentals of Theater Production (two-credit course; must take a total of six credits)

The following upper-division courses must be taken to complete the major:

Eight, 5-credit upper-division theater arts courses:

160, Dramatic Theories

Two studio courses

One elective

One faculty-directed theater arts production course

Two 161, 163, 164, or 165 series of critical studies courses in dance or drama, or 113, 116A (design) courses

One senior seminar requirement, (course 185)

Exceptions to the major requirements, through the UC Education Abroad Program (EAP) or transfer credits, are considered on a case-by-case basis by the department chair.

#### DISCIPLINARY COMMUNICATION (DC) REQUIREMENT

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Students of every major must satisfy that major's upper-division Disciplinary Communication (DC) Requirement. The DC Requirement in theater arts is met by completion of the required courses 160 and 185.

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### THEATER ARTS MAJOR PLANNERS

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The following are two recommended academic plans for students to complete during their first two years as preparation for the theater arts major. Plan One is a guideline for students who are committed to the major early in their academic career; Plan Two is for students who are considering the major.

## Theater Arts

<b>Plan One</b>			
<b>Year</b>	<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
1st (frsh)	THEA 61A	THEA 20	THEA 10
	gen ed	THEA 61B	gen ed
	college core	gen ed	gen ed
2nd (soph)	THEA 30	elective	THEA 61C
	gen ed	THEA 50	gen ed
	college core	gen ed	gen ed
	(declare major)		

<b>Plan Two</b>			
<b>Year</b>	<b>Fall</b>	<b>Winter</b>	<b>Spring</b>
1st (frsh)	gen ed	THEA 20	THEA 10
	gen ed	low-div studio	THEA 61C
	college core	gen ed	gen ed
2nd (soph)	THEA 30	THEA 50	THEA 50
	THEA 61A	THEA 61B	gen ed
	gen ed	gen ed	gen ed
	(declare major)		

### COMPREHENSIVE REQUIREMENT

Theater arts majors are responsible for successfully completing course 185, Senior Seminar.

### MINOR REQUIREMENTS

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 either drama, theater design/technology, or dance. The course requirements are listed below. There is no comprehensive requirement for the minor.

Theater Arts 61A or B or C

One quarter of the 2-credit course 50

One course in the student's area of focus chosen from: 10, 20, 30, or 40

Three upper-division courses chosen from the following: 113, 116A, 161, 163, 164, 165

Two upper-division studio courses, one of which may be a faculty-directed production (151)

Independent Studies (199) and Field Studies (198) will not satisfy minor requirements unless approved in advance by an adviser and the chairperson.

Transfer students are advised to check with the department office to determine which courses can be articulated from a community college.

### THE DANCE MINOR

Students earn a minor in dance by completing eight courses (three lower division, five upper division) comprising a background in the theory and practice of dance. The course requirements are listed below. There is no comprehensive requirement for the minor.

#### LOWER DIVISION COURSES:

- one 5-credit course in dance foundations (30 or 36); one course (varying units) in cultural forms (including but not restricted to 22, 37, 80Z)
- one quarter of the 2-credit course 50

#### UPPER DIVISION COURSES:

- one 5-credit course in dance foundations (130); one course in critical studies (164, 165)
- three 5-credit elective courses planned in consultation with a faculty adviser (including but not restricted to 122, 131, 135, 137, 138, 139)
- Independent Studies (199) and Field Studies (198) will not satisfy minor requirements unless approved in advance by an adviser and the chairperson.
- Transfer students are advised to check with the department office to determine which courses can be articulated from a community college.

### THE THEATER ARTS MASTER OF ARTS PROGRAM

The Theater Arts Department offers a master's of arts (M.A.) degree that follows a one summer/one academic year structure and combines intellectually rigorous coursework with challenging artistic practicum. Like our undergraduate curriculum, our graduate program integrates the study of ancient and modern theater texts and practices, and it examines hemispheric and global approaches to performance. This M.A. program culminates in a capstone thesis project (creative and scholarly) following coursework in both academic and professional theater.

Students are required to complete 40 credits for the Theater Arts M.A. This includes three graduate seminars, Theater Arts 290A, 290B, and 290C, for a total of 15 credits. These courses are required of all M.A. candidates, whatever their area of emphasis. Students must also complete Theater Arts 293, a 10-credit performance research project that includes a professional internship project. Students may take this course in any quarter in the academic year. This work

## Theater Arts

will have a significant academic component, supervised and assessed by a theater arts faculty member.

Students must also complete the 5-credit Theater Arts 295, Group Critique; 5 units of an Independent Study (Theater Arts 297); and the 5-credit Theater Arts 299, Capstone Thesis.

M.A. students may also take an undergraduate or graduate course in another department as an elective.

These courses must be approved by the graduate committee and graduate director each academic year.

There are no teaching requirements for graduate students in the theater arts M.A. program; however, students are encouraged to act as teaching assistants while they are at UC Santa Cruz.

For additional information, contact the Theater Arts Department.

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## THEATER ARTS FACULTY AND PROFESSIONAL INTERESTS

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### PROFESSOR

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**James H. Bierman**

Playwriting, theater history and literature, classical and Renaissance drama, Chicano theater, digital media

**David Cuthbert**

Lighting design, CADD, projection design, scenic design

**Kate Edmunds**

Set design for theater and film

**M. Kathleen Foley**

Asian theater, Southeast Asian studies, performance studies, maskwork, puppetry, multicultural theater

**Patty Gallagher**

Movement training for actors, circus and clown traditions, and Indonesian dance/performance

**Kimberly Jannarone**

Directing, dramaturgy, dramatic theory and criticism, theater history, acting

**Danny Scheie**

Acting, directing, dramatic literature, theater history, Shakespeare, Wagner, gay studies

**Edward C. Warburton**

Development of dance thought in action, creative processes, and technology in theater arts; dance technique, movement research and composition, and applied dance practices

**Paul Whitworth**

Acting, directing, dramatic literature, (English and Spanish Renaissance), translating dramatic literature

### ASSOCIATE PROFESSOR

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**Brandin Baron**

Costume design, history of design

**Michael Chemers**

Theater history and theory, playwriting, dramaturgy, acting

### ASSISTANT PROFESSOR

---

**Gerald Casel**

Choreography and improvisation; somatics and techniques

**Amy Ginther**

Acting with an emphasis in voice

### LECTURER

---

**Tandy Beal**

Choreography, improvisation, technique, performance skills, collaborations with classical and jazz composers, circus, theater and video, children's productions

**Kirsten Brandt**

Directing, playwriting, and acting

**Gregory Fritsch**

Acting, directing

### EMERITI

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**Andrew E. Doe, Emeritus****Mark Franko, Emeritus****Norvid J. Roos, Emeritus****Ruth L. Solomon, Emerita****Audrey E. Stanley, Emerita****Alma R. Martinez, Emerita****Elaine Yokoyama Roos, Emerita****Mary-Kay Gamel, Emerita****Sean Keilen, Associate Professor, Literature**

Shakespeare; Ovid; the classical tradition; early British literature; Renaissance humanism; poetry and poetics; imitation; theory of literature; interpretation and its history; the division of the arts and sciences; creative criticism; literature and the fine arts; literature and ethics; psychoanalysis; the passions; the senses; beauty

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**THEATER ARTS COURSES**


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**LOWER-DIVISION COURSES****10. Introduction to Theater Design and Technology. F,S**

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. (General Education Code(s): IM, IH, A.) B. Baron, K. Edmunds

**12. Stage Management. F**

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. Students are billed a materials fee. (Formerly Production Management.) (General Education Code(s): A.) The Staff

**14. Drawing. \***

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. Students are billed a materials fee. (General Education Code(s): PR-C, A.) K. Edmunds

**15. Special Topics in Textiles. \***

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. Enrollment limited to 20. (General Education Code(s): PR-C, A.) B. Baron, The Staff

**17. Costume Construction. W**

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. Students are billed a materials fee. Enrollment limited to 20. (General Education Code(s): PR-C, A.) The Staff

**18. Drafting for Theatrical Production. W**

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. Students are billed a materials fee. Enrollment limited to 20. (General Education Code(s): A.) K. Edmunds, The Staff

**18C. Drafting-Computer Aided. \***

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. Students are billed for a materials fee.

Enrollment restricted to theater arts majors. Enrollment limited to 10. (General Education Code(s): A.) D. Cuthbert, The Staff

**19. Design Studio: Lighting Studio A. S**

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. Students are billed a materials fee. Prerequisite(s): course 10. (General Education Code(s): PR-C, IH, A.) D. Cuthbert

**20. Introductory Studies in Acting. F,S**

Introduction to basic acting skills and the problems of performance. Concentrates on expanding the students' range of expression and ability to respond to and analyze dramatic text. Students with little or no experience are encouraged to attend. (General Education Code(s): IM, IH, A.) P. Gallagher, The Staff

**21A. Acting Studio 1A: Psychological Realism. F,W**

Explores the fundamentals of 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

## Theater Arts

objectives, throughline, superobjective, and emotional recall to works of Henrik Ibsen, Anton Chekov, and appropriate American realists, such as Sam Shepard, August Wilson, etc. Enrollment by interview only: audition at first class meeting. Enrollment limited to 31. (General Education Code(s): A.) D. Scheie

### **21B. Acting Studio 1B, Actors' Physicality. \***

Uses a rigorous physical approach to acting (rather than the text-based approach of course 21A). Provides an "outside-in" starting point for theatrical creation and study, balancing and countering the "inside-out" approach of Stanislavski-based actor training. Emphasis on physical characterization, ensemble theater, mask work, and object performance. May involve practices, theories, and readings of Jerzy Grotowski, Eugenio Barba, Jacques Lecoq, and/or Tadashi Suzuki. Enrollment by interview only. Enrollment limited to 30. (General Education Code(s): A.) P. Gallagher

### **22. Indonesian Dance and Drama. F**

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. The course culminates in an open showing of scene work. May be repeated for credit. (General Education Code(s): CC, A, E.) P. Gallagher

### **23. Voice for the Actor. F**

Students work on developing resonance, range and expressivity for stage performance via physical exercises and text explorations undertaken in small groups. Prerequisite(s): course 20. Audition

required for acceptance into class. Enrollment limited to 20. (General Education Code(s): A.) The Staff

### **30. Introduction to Dance Theory and Technique. W,S**

Intensive instruction in developing the dancer's mind/body, with introduction to movement theory and practice. Students are billed a materials fee. (Formerly Introduction to Modern Dance Theory and Technique.) May be repeated for credit. (General Education Code(s): PR-C, IH, A.) E. Warburton, The Staff

### **31P. Postmodern Dance I. \***

Introduction to postmodern dance theory and technique. Focus on performance practices of historically significant postmodern dance choreographers in the U.S. and worldwide. Enrollment limited to 30. May be repeated for credit. (General Education Code(s): IM, A.) E. Warburton

### **33C. Dance Studio I. F**

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. Students are billed a materials fee. Formerly Theater Arts 33, Advanced Introduction to Modern Dance. Prerequisite(s): course 30. Enrollment limited to 30. May be repeated for credit. (General Education Code(s): IH, A.) G. Casel

### **36. Introduction to Dance Composition. S**

Composing solo dances using a variety of approaches for developing movement combinations. Observation and recognition of personal movement patterns and discovering new sources for creative material. Students are billed a materials fee.

May be repeated for credit. (General Education Code(s): PR-C, IH, A.) E. Warburton

### **37. African Dance. S**

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. Students are billed a materials fee. Enrollment limited to 30. (General Education Code(s): PR-C, A.) The Staff

### **40. Introduction to Directing. F**

An overview of the analytical and creative processes that inform the director's work. Close examination of texts, concepts, and directorial choices in staged performances, opera, films, and video. (General Education Code(s): IM, IH, A.) The Staff

### **45. Student-Directed Production. F,W,S**

Participation in a student-directed play or student-choreographed dance concert under faculty supervision. (See course 192). Rehearsals culminate in public performances. Prerequisite(s): admission by audition; see department office for more information. The Staff

### **50. Fundamentals of Theater Production (2 credits). F,W,S**

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. May be repeated for credit. D. Cuthbert, The Staff

### **52. Basic Stagecraft. S**

Provides introduction to technical theater and basic stagecraft. Course examines two-dimensional and

## Theater Arts

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(s): course 10.

Enrollment limited to 30. (General Education Code(s): A.) The Staff

### **55A. Workshop in Performance: Barnstorm. F,W,S**

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. May be repeated for credit. D. Cuthbert, The Staff

### **55B. Workshop in Performance: Barnstorm Lab (2 credits). F,W,S**

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. May be repeated for credit. K. Edmunds, D. Cuthbert

### **61A. Ancient and Medieval Drama. F**

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. (Formerly Issues and Methods in Theater Arts.) (General Education Code(s): TA, IH, A.) M. Chemers

### **61B. Drama from the Renaissance to the Modern Age. W**

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. (Formerly Tragedy.) Enrollment limited to 40. (General Education Code(s): TA, IH, A.) K. Jannarone, The Staff

### **61C. The Birth of the Modern: Drama and Performance After the Renaissance. S**

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 that changed the concrete experience of life itself. Enrollment limited to 60. (General Education Code(s): TA, IH, A.) K. Jannarone

### **80A. Introduction to African American Theater. \***

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. Enrollment limited to 50. (General Education Code(s): ER, T4 (TH), A, E.) The Staff

### **80B. Rock 'n' Roll Design. \***

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. (General Education Code(s): T4-Humanities and Arts, A.) The Staff

### **80C. Monsters. W**

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. (General Education Code(s): PE-H.) M. Chemers

### **80D. Commercial Design 1900 to Present. \***

History of 20th-century commercial design for the theater through the eyes of the Western consumer. (Formerly course 161W, Critical Survey of Commercial Design, 1900 to Present.) (General Education Code(s): IM, T4-Humanities and Arts, A.) B. Baron

### **80H. Hamlet Conundrums. \***

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

## Theater Arts

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](http://elsinore.ucsc.edu) and write to [elsinore@ucsc.edu](mailto:elsinore@ucsc.edu). (General Education Code(s): T4-Humanities and Arts, A.) J. Bierman

### **80K. Shakespeare 4every1. S**

Introduces all students, regardless of experience, to the plays and theater of Shakespeare, and directly addresses linked relevance to contemporary 21st century American culture. (General Education Code(s): TA, T4-Humanities and Arts, A.) D. Scheie

### **80L. Muppet Magic: Jim Henson's Art. F**

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. (General Education Code(s): IM, T4-Humanities and Arts, A.) The Staff

### **80M. Chicano/a Teatro. \***

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. (General Education Code(s): ER, T4 (TH), A, E.) The Staff

### **80N. Walt Disney. S**

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. (General Education Code(s): IM, T4-Humanities and Arts, A.) The Staff

### **80P. The Pixar Feature. \***

Combines examination of the canon of Western dramatic literature and theater history through viewings of Pixar Animation Studios' full-length animated features, representing the most popular form of digital art and new media in the world today, and lectures focusing on digital art and new media viewed through established rules and traditions of dramatic art in literature, plays, and the theater. (General Education Code(s): IM, T4-Humanities and Arts, A.) D. Scheie

### **80Q. Introduction to Queer Theater. \***

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. (General Education Code(s): IM, T4-Humanities and Arts, A.) The Staff

### **80S. Theater Arts Education and the Community. \***

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. (General Education Code(s): T4-Humanities and Arts, A.) The Staff

### **80T. Flashmob! Mass Performance in the Information Age. \***

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. (General Education Code(s): PE-T.) E. Warburton

### **80V. The Circus in American Culture. \***

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. (General Education Code(s): T4-Humanities and Arts, A.) The Staff

### **80X. The Performance of Story in Theater and Film. \***

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. (General Education Code(s): TA, T4-Humanities and Arts, A.) The Staff

### **80Y. American Musical Theater. \***

The history of American musical theater, from it's roots to today, is studied through scripts, scores, and film. Major composers and lyricists' work is shown, discussed, and analyzed. (General Education

## Theater Arts

Code(s): T4-Humanities and Arts, A.) K. Edmunds

### **80Z. Indian Dance. F**

Classical Indian dance will be studied as a performance practice. Understanding of drum syllables and associated steps, religious and sociological context, and mimesis (abhinaya) as well as introduction to epic stories (Ramayana, Mahabharata, Bhagavata Purana) and classical song. (General Education Code(s): CC, T4-Humanities and Arts, A.) The Staff

### **99. Tutorial. F,W,S**

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. May be repeated for credit. The Staff

## UPPER-DIVISION COURSES

### **100A. Asian Theater/Dance and Global Impacts. \***

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. (General Education Code(s): A, E.) M. Foley

### **100B. Black Theater USA. \***

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. (General Education Code(s): A, E.) The Staff

### **100C. Courts, Courtesans, Shamans, and Clowns: Asian Drama. \***

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. (General Education Code(s): A.) P. Gallagher, M. Foley

### **100W. Black/African Diasporic World Theater. \***

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(s): course 61 or 60A or 60B or 60C. (General Education Code(s): A, E.) The Staff

### **103. Design Concept Development. W**

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): Theater Arts 10; or two courses from ART 10D, 10E, and 10F. Enrollment is by permission of the instructor. Theater Arts 106 is recommended as preparation. (Also offered as Art

143T. Students cannot receive credit for both courses.) B. Baron

### **104. Multimedia Authoring. \***

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. Enrollment limited to 25. (General Education Code(s): A.) J. Bierman

### **106. Digital Illustration. \***

Introduces digital rendering techniques using the Adobe Creative Suite. Using Adobe Creative Suite, students solve design problems. Enrollment by permission of the instructor. Application form available from baron@ucsc.edu. (Also offered as Art 146T. Students cannot receive credit for both courses.) Enrollment limited to 30. (General Education Code(s): A.) B. Baron

### **108. Theater and Interaction Design. S**

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. Enrollment is restricted to juniors and seniors. Enrollment limited to 60. (General Education Code(s): IM.) B. Laurel

### **113. The History of Design for Theater. F**

The development of scenic design from the Greek period to the present. Concentration is on the changing styles of set design in

## Theater Arts

relation to the changing attitudes toward dramatic literature, art, and theater architecture. (General Education Code(s): IM, A.) K. Edmunds

### **114. Design Studio: Sound. \***

The intangible and transitory nature of the acoustic reality. Electronically regenerated sounds for use in the performing arts. Broad scope of the course consideration begins with found sound and includes sound propagation. Emphasis on tape-recording, editing, sound control functions, and equipment utility. Students are billed a materials fee. Prerequisite(s): course 10. (General Education Code(s): PR-C, A.) The Staff

### **115A. Design Studio: Scenic Design. S**

Advanced work in principles and theory of scenic design. Students are billed a materials fee. Prerequisite(s): course 10. (General Education Code(s): PR-C, A.) K. Edmunds

### **115B. Design Studio: Scenic Design B. \***

Advanced theory and practice of theatrical set design. Prerequisite(s): course 115. (General Education Code(s): PR-C, A.) K. Edmunds

### **116A. History of Clothing and Costume. \***

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. (General Education Code(s): IM, A.) B. Baron

### **117. Design Studio: Costume. \***

Students learn advanced principles and theory of costume design, and apply these towards a large project

for theatrical/film production or for character design for animation and gaming. Students are billed a materials fee. (Also offered as Art 147T. Students cannot receive credit for both courses.) Enrollment limited to 30. May be repeated for credit. (General Education Code(s): IM, A.) The Staff

### **117A. Advanced Costume Construction. \***

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(s): course 17. Enrollment limited to 25. (General Education Code(s): A.) The Staff

### **118. Design Studio: Scene Painting. \***

Emphasis on techniques used in painting scenery for the theater. Students are billed a materials fee. Prerequisite(s): course 10. (General Education Code(s): A.) The Staff

### **119. Design Studio: Lighting Studio B. \***

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. Students are billed a materials fee. Prerequisite(s): course 19. (General Education Code(s): PR-C, A.) D. Cuthbert

### **121. Acting Studio II. \***

Continuing concentrated work on basic acting skills and textual analysis through scene study. May be repeated for credit with consent

of instructor. Prerequisite(s): admission by audition at first class meeting. See department office for more information. Course 21 recommended as preparation. May be repeated for credit. (General Education Code(s): A.) The Staff

### **122. Indian Performance: Rama, Siva, Krishna. \***

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. (General Education Code(s): CC, IH, A.) The Staff

### **124. Movement for Performers. \***

Awareness and extension of personal movement repertoire, through observation, movement experience, and exploration. (General Education Code(s): A.) P. Gallagher, The Staff

### **126. Acting Studio III. W,S**

Individual work on acting skills and problems, with emphasis on individual interpretation and scene work with other students. Prerequisite(s): course 121; permission of instructor; audition at first class meeting—contact department office for more information. Enrollment limited to 18. May be repeated for credit. (General Education Code(s): A.) P. Gallagher, The Staff

### **128. Choreographic Workshop (2 credits). W**

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 course 139 is required. Enrollment limited

## Theater Arts

to 15. May be repeated for credit. (General Education Code(s): PR-C, A.) G. Casel, E. Warburton

### **130. Intermediate Dance Theory and Technique. W**

A progression from the simple phrasing and articulation of beginning technique class to more complex material requiring more acute perceptive skills and richer dynamic range. Emphasis is on both alignment and maintaining the kinetic integrity of the body while moving through space. Students are billed a materials fee. (Formerly Intermediate Modern Dance Theory and Technique.) Prerequisite(s): course 30 or 31 or permission of instructor. May be repeated for credit. (General Education Code(s): IM, A.) G. Casel, The Staff

### **131. Advanced Dance Theory and Technique. \***

Advanced instruction in developing the dancer's mind/body, combined with contemporary movement theory and practice. Students are billed a materials fee. (Formerly Advanced Modern Dance Theory and Technique.) Prerequisite(s): course 30 or 31 or permission of instructor. May be repeated for credit. (General Education Code(s): A.) E. Warburton

### **131C. Dance Studio II. \***

Continued study of contemporary dance theory and practice. Focus on intermediate dance technique, individual and group movement invention, choreographic voice, and theatrical applications. Students are billed a materials fee. Enrollment limited to 30. (General Education Code(s): A.) The Staff

### **131P. Postmodern Dance II. \***

Continued study of postmodern dance theory and technique. Focus on advanced compositional practice, theatrical applications, and

critical analysis of contemporary postmodern dance choreographers in the U.S. and worldwide. Audition at first class meeting. Enrollment limited to 30. May be repeated for credit. (General Education Code(s): IM, A.) E. Warburton

### **135. Dance Improvisation and Theory. \***

Exploring sources for movement; gaining facility in a wide range of movement elements; working in ensemble and solos. Students are billed a materials fee. (General Education Code(s): A.) E. Warburton

### **136. Choreography. F**

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. (Formerly course 136C, Dance Studio III.) Enrollment limited to 30. May be repeated for credit. (General Education Code(s): PR-C, A.) G. Casel

### **137. Studies in Performance (Dance). S**

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. Students are billed a materials fee. Admission by audition held late winter quarter; see department office for more information. May be repeated for credit. (General Education Code(s): A.) G. Casel

### **139. Random: With a Purpose. W**

Participation in a student-choreographed and directed dance

concert under faculty supervision. Rehearsals culminate in public performances. Students are billed a materials fee. Auditions to be held on the first day of class. May be repeated for credit. (General Education Code(s): PR-E, A.) E. Warburton

### **141. Play Direction Studio I. W**

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. Enrollment limited to 20. K. Jannarone

### **142. Play Direction Studio II. \***

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(s): course 40, 141, or permission of instructor. Enrollment limited to 15. May be repeated for credit. (General Education Code(s): A.) The Staff

### **151. Studies in Performance (Drama). F,W,S**

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. May be repeated for credit. (General Education Code(s): A.) D. Scheie, The Staff

### **151A. Studies in Performance: African American Theater Arts Troupe. W**

Studies in drama; emphasis on African American theater taken in

## Theater Arts

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. May be repeated for credit. (General Education Code(s): ER.) D. Williams

### **151I. Studies in Performance: Indonesian Dance and Drama. \***

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. May be repeated for credit. (General Education Code(s): CC.) P. Gallagher, M. Foley

### **152. Advanced Stagecraft. \***

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(s): course 52. Enrollment limited to 25. (General Education Code(s): A.) The Staff

### **153. Taking It to the Street: Performance and Politics/Politics of Performance. \***

Covers the theory, history, and practice of performance and new media as sociopolitical intervention. Includes performance in an urban context; site-specific and street theater; puppetry; environmental theater; culture jamming, including radio, television, billboards, and records; and digital interventions. Students are billed a materials fee. (Formerly Art 175.) May be repeated for credit. (General Education Code(s): PR-C.) The Staff

### **155. Workshop Experiments in Performance. \***

A process-oriented investigation of specific playwrights or theatrical styles consisting of work which may culminate in a final production. Admission by audition at first class meeting; see department office for more information. May be repeated for credit. (General Education Code(s): A.) P. Gallagher

### **157. Playwriting. F**

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(s): satisfaction of the Entry Level Writing and Composition requirements. May be repeated for credit. (General Education Code(s): W,A.) J. Bierman

### **158. Chautauqua Workshop. \***

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 are billed a materials fee. Students taking the course as directors are required to obtain consent of the instructor. Other students may enroll as usual. May be repeated for credit. The Staff

### **159. Advanced Playwriting. W**

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(s): course 157 or equivalent, satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 25. May be repeated for credit. (General Education Code(s): W,A.) J. Bierman

### **160. Dramatic Theories. S**

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(s): satisfaction of the Entry Level Writing and Composition requirements. (General Education Code(s): A.) M. Chemers

### **161. Theater, Literature, and History. W,S** The Staff

#### **161A. Irish Theater. \***

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. Enrollment limited to 45. (General Education Code(s): A.) P. Whitworth

#### **161C. The Theater and Drama of Renaissance Europe. \***

An examination of selected plays from Renaissance Europe (1580-1680, Italy, Spain, and France) from an explicitly theatrical viewpoint which will include practical scene study. Covers Renaissance theater buildings and some related critical materials. (General Education Code(s): A.) P. Whitworth

**161D. Asian Theater: An Anthropological Approach. \***  
Art serves simultaneously to

## Theater Arts

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. Offered in alternate academic years. (General Education Code(s): CC, A, E.) The Staff

### **161M. Sexuality, Gender, Drama, and Performance. \***

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. (Formerly Gender and Performance.) (General Education Code(s): A.) D. Scheie

### **161P. Theater in the "Chicano Power" Movement. \***

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. (Also offered as Latin American&Latino Studies 161P. Students cannot receive credit for both courses.) (General Education Code(s): ER, A, E.) The Staff

### **161Q. Queer Theatricals: Representations and Sensibilities. \***

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. (General Education Code(s): A.) The Staff

### **161R. Theater of American Cultures. \***

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. (General Education Code(s): A, E.) The Staff

### **161S. American Drama: Politics and Theater. \***

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. (General Education Code(s): A.) The Staff

### **161T. Women in Theater. \***

Explores 20th-century American female playwrights from textual, historical, and multicultural perspectives. The course 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. (General Education Code(s): A.) P. Gallagher

### **161U. Performance of Story in Theater and Film. \***

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 course 80X. (General Education Code(s): A.) The Staff

### **161Y. Modern Ancient Drama. \***

Studies 20th- and 21st-century productions and adaptations of ancient Greek drama in theater, dance, music, and film, including Stravinsky, O'Neill, Graham, Pasolini, and Breuer, discussing artists' goals, the sociopolitical context, ideas of authenticity, and audience response. (Also offered as Cowell College 161Y. Students cannot receive credit for both courses.) Enrollment limited to 30. (General Education Code(s): A.) The Staff

### **163. Special Studies in Individual Playwrights. W**

The Staff

#### **163A. Shakespeare. \***

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. Offered in alternate academic years. (General Education Code(s): A.) P. Whitworth

#### **163E. Chekhov and His Impact. \***

Delves into the work of Chekhov and the Moscow art theater. Through scene work Stanislavski's acting techniques are related to the scripts. The impact on later Russian innovators, especially Meyerhold, and on the American theater is considered. (General Education Code(s): A.) The Staff

#### **163G. Special Studies in Playwrights: Artaud. \***

Antonin Artaud through three critical lenses: influence on modern and contemporary theater, subject

## Theater Arts

and site of psychoanalytic and social criticism, and theater practitioner. Exercises cultural, historical, and analytic approaches to his work. Prerequisite: course 160 recommended. Enrollment limited to 40. (General Education Code(s): A.) K. Jannarone

### **163H. Henrik Ibsen and His Impact: Ghosts of the Future. \***

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. (General Education Code(s): TA.) P. Whitworth

### **163K. Special Studies in Playwrights: Euripides. \***

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(s): course 61A or permission of the instructor. Enrollment limited to 40. (General Education Code(s): TA.) J. Bierman

### **164. Issues in Dance History and Theory. F**

A research seminar. Topics range from problems in dance aesthetics, criticism, or theory to particular movements, periods, or the work of a choreographer. (Formerly course 133.) Enrollment limited to 20. May be repeated for credit. (General Education Code(s): A.) E. Warburton

### **165. Dance Modernism. \***

Rare historical footage and the writings of famous choreographers provide an overview of 20th-century dance within the

perspective of modernism. Topics include romanticism, "natural" dance, Orientalism, Ausdruckstanz, American modern dance and neo-classicism, chance procedure, postmodernism, and the avant-garde commodity marketplace. (Formerly Introduction to Dance Modernism.) (General Education Code(s): IM, A.) E. Warburton

### **166. Ballet: A History. \***

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, sexual orientation. (General Education Code(s): ER, A.) E. Warburton

### **185. Senior Seminar. F**

A required seminar for majors involving readings and discussions of important texts in dance, design, and drama. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; course 160. B. Baron

### **190. Group Projects. F,W,S**

Prerequisite(s): petition required, approved by instructor and department. May be repeated for credit. The Staff

### **192. Directed Student Teaching. F,W,S**

Teaching a lower-division seminar under faculty supervision. (See courses 42 and 45). Petition required, approved by instructor and department. The Staff

### **193. Proseminar. \***

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. Enrollment

limited to 25. May be repeated for credit. (General Education Code(s): A.) The Staff

### **193F. Proseminar (2 credits). \***

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. Enrollment limited to 25. May be repeated for credit. (General Education Code(s): A.) The Staff

### **198. Independent Field Study. F,W,S**

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. The Staff

### **198F. Independent Field Study (2 credits). F,W,S**

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. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

Individual study in areas approved by sponsoring instructors. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

**199F. Tutorial (2 credits). F,W,S**  
Individual study in areas approved

## Theater Arts

by sponsoring instructors. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### GRADUATE COURSES

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#### **290A. Text Analysis. F**

Presents a range of performance blueprints (texts, scores, libretti, etc.), and introduces key methodologies for translating text into performance. A final paper required. Enrollment restricted to graduate students in theater arts. May be repeated for credit. K. Jannarone

#### **290B. Performance Histories. W**

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. Enrollment restricted to graduate students in theater arts. May be repeated for credit. J. Bierman

#### **290C. Performance Analysis. S**

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. Enrollment restricted to graduate students in theater arts. May be repeated for credit. The Staff

#### **291. Field Study. F,W,S**

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. The Staff

#### **292. Teaching-Related Independent Study. F,W,S**

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. The Staff

#### **293. Performance Research Project (10 credits). F,W,S**

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. The Staff

#### **295. Group Critique. W**

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. Enrollment restricted to graduate students. The Staff

#### **297. Independent Study. F,W,S**

Independent study or research for graduate students in theater arts. Petition required, approved by instructor and department. May be repeated for credit. The Staff

#### **297F. Independent Study/Graduate (2 credits). F,W,S**

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. May be repeated for credit. The Staff

#### **299. Capstone Thesis. S**

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. Enrollment restricted to graduate students. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# UCDC PROGRAM

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2015-16 General Catalog

25 Merrill College

(831) 459-2855

[politics@ucsc.edu](mailto:politics@ucsc.edu)

<http://politics.ucsc.edu>

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## PROGRAM DESCRIPTION

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### UCDC PROGRAM AT THE UNIVERSITY OF CALIFORNIA WASHINGTON CENTER

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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 a competitive application process to students in all majors who are in good standing and will be juniors or seniors by the quarter in which they participate. Students enroll for fall, winter, or spring quarter, earn 12 to 17 course credits, 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 more information, e-mail [ucdc@ucsc.edu](mailto:ucdc@ucsc.edu), contact the UCDC coordinator in 10 Merrill College, or visit the program's [web site](#).

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## UCDC COURSES

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### UPPER DIVISION COURSES

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#### **194A. UCDC Internship Research Seminar. F,W,S**

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 restricted to students participating in the UCDC Program. (Formerly Social Sciences 194A.) Enrollment limited to 22. The Staff

#### **194B. UCDC Internship Seminar (7 credits). F,W,S**

A 30- to 36-hour-per-week internship in a Washington, D.C., government, non-profit, or private institution. Required for and enrollment restricted to UCDC program participants. (Formerly Social Sciences 194B, UCDC Internship and Internship Seminar.) Enrollment limited to 22. May be repeated for credit. The Staff

#### **199. Tutorial. F,W,S**

A program of directed study arranged with a Social Sciences Division faculty member. Enrollment restricted to participants in the UCDC program. (Formerly Social Sciences 199.) The Staff

#### **199F. Tutorial (2 credits). F,W,S**

A program of directed study arranged with participating faculty. Class time is proportionally less than a 5-credit course. Enrollment restricted to participants in the UCDC program. (Formerly Social Sciences 199F.) The Staff

Revised: 09/01/15

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# WRITING PROGRAM

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2015-16 General Catalog

209 Humanities 1

(831) 459-2431

<http://writing.ucsc.edu/>

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## PROGRAM DESCRIPTION

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The campuswide Writing Program offers courses designed to help students become more competent and confident writers of prose. The courses offered through this program teach skills of grammar and organization and strategies of invention, composition, revision, and editing. These courses approach writing as one of the most important ways we have of making discoveries about ourselves and the world and of communicating these insights to others.

Together with the colleges, the Writing Program administers the writing components (C1, C2) of the campus general education requirements; administers the Entry Level Writing Requirement (ELWR), and advises students about ways to fulfill these requirements.

Writing Program instructors in each college participate in the college's core course and counsel students about their writing. The Writing Program offers Writing 2 (a lower-division course that satisfies the C2 requirement); the Writing 20, 21, 22, 23 series to help meet the needs of students who have not passed ELWR,

including students with complex linguistics backgrounds; instruction for undergraduates in the theory and practice of peer tutoring (Writing 169 and 159); and instruction for graduate students from all disciplines in the theory and practice of teaching first-year composition courses (Writing 203).

Each year, the Writing Program also offers specialized lower-division courses (such as Writing 22A and 22B) for multilingual and international students to provide additional grammar support for essays written in fall core courses and in spring Writing 2 classes.

The Writing Program houses the Humanities Don Rothman Endowed Award in First-Year Writing. Now in its fifth year of honoring outstanding first-year writers and of recognizing the pedagogical inspirations of their teachers, the endowment celebrates students' academic achievements during a fall ceremony attended by friends, family, faculty, and administrators.

Courses in creative writing are offered through the Literature Department.

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## WRITING PROGRAM FACULTY AND PROFESSIONAL INTERESTS

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### LECTURER WITH SECURITY OF EMPLOYMENT

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#### **Heather Shearer, Chair**

Writing program administration; curriculum design and assessment; rhetorical practices of intentional communities; technical communication; usability of complex information products

#### **James Wilson**

Modern European literary, artistic, intellectual, and political movements (especially of France, Italy, and Spain); poetry of Ezra Pound; Provençal poetry; classical Chinese poetry and philosophy; poetry translation; argument in popular culture; the rhetoric of sports; public speaking; medical science; graduate student teaching mentorship; composition pedagogy for first-year and multilingual students

#### **Kimberly Helmer**

Spanish heritage language learning, English for academic purposes, assessing multimodality

#### **Tonya Ritola**

Writing program administration; curriculum design and assessment; organizational rhetoric; genre studies

#### **Roswell Spafford, Emerita**

Senior Lecturer with Security of Employment

#### **Elizabeth Abrams**

Composition and rhetoric; writing pedagogy, writing across the curriculum; 19th-century and 20th-century American history and literature, especially concerning the Civil War

#### **Carol M. Freeman, Emerita**

## Writing Program

### LECTURER

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#### **Margaret Amis**

Writing; pre- and early modern English literature; prose style

#### **Sondra Archimedes, College Nine Writing Coordinator**

Writing pedagogy; 19th- and early 20th-century British literature; gender studies; cultural studies

#### **Derede Arthur**

Cultural studies, 18th–20th-century British literature, theory of the novel, theories of education, cognitive ethology

#### **Mark Baker, Oakes College Writing Coordinator**

Media and democracy, postmodernism, 20th-century literature and culture of the Americas, community participation, writing and social responsibility

#### **Farnaz Fatemi**

Writing, poetry, writing pedagogy, comics and graphic novels, Middle East issues and cross-cultural perspectives, contemporary American literature.

#### **BK Faunce**

Late 18th-century and early 19th-century British literary culture, film, literary theory

#### **Joy Hagen, College Eight Writing Coordinator**

Science writing; writing for physical and biological sciences; ecological risks of genetically engineered organisms; population dynamics; agroecology and food systems; entomology; science and uncertainty (Science and Technology Studies); California Common Core standards

#### **Erica Halk, College Ten Writing Coordinator**

Post-secondary reading and writing pedagogy; American literature; cultural criticism; gender studies

#### **Roxanne Power Hamilton**

Writing, poetry, magazine editing, inter-arts performance, gender and queer studies

#### **Robin King, Oakes College Writing Coordinator**

Visual arts, media criticism, sociology of learning and emotions, multi-cultural studies, politics of food

#### **Lindsay Knisely**

Digital identity production in youth; establishing ethos in writing; writing of witness; African-American literature and literary theory; writing as social activism;

writing as identity development; poetry analysis and interpretation; development of critical consciousness

#### **Toby Loeffler**

Writing pedagogy; early 20th-century British and Spanish literature; history and theory of the British and European novel; British and European modernism; literature and nationalism; ideology; cultural studies

#### **Brij Lunine, Stevenson College Writing Coordinator**

Writing pedagogy; writing across the curriculum, teaching research; reception studies, cultural studies, popular culture and youth subcultures

#### **Patrick McKercher**

Virtual reality educational environments, outreach projects, collaborative research with James Burke, environmental education

#### **Ingrid Moody Lariviere, Porter College Writing Coordinator**

#### **Ellen Newberry, Merrill College Writing Coordinator**

Educational partnerships with K–12 schools, transfer/re-entry student writing, women’s studies, and queer studies

#### **Sarah-Hope Parmeter, Coordinator, Entry Level Writing Requirement (ELWR)**

Writing and democracy; multilingual, multicultural rhetorics; cross-age writing partnerships and public school collaboratives; lesbian/gay/bisexual/transgender young adult literature; rhetoric of the sciences

#### **Annalisa Rava, Crown College Writing Coordinator**

Animals and human society, science fiction studies, literature and postmodernism

#### **Denise Silva**

Cultural studies; urban studies; gender studies; 19th- and 20th-century British literature; composition and rhetoric

#### **Robin Somers**

Sustainable agriculture and cooking organically; online journalism (blogging), Native American literature, culture and politics

#### **Amy Weaver**

Creative nonfiction, writing pedagogy

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## WRITING PROGRAM COURSES

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### LOWER-DIVISION COURSES

**2. Rhetoric and Inquiry. F,W,S**

Explores the intersections of investigation, interpretation, and persuasion and hones strategies for writing and research. Students develop specific, practical ways of improving their writing through sustained critical thinking about diverse issues from multiple points of view. Students cannot receive credit for this course and course 1. Prerequisite(s): satisfaction of the Entry Level Writing and C1 requirements. Enrollment limited to 25. (General Education Code(s): C2.) The Staff

**11A. Adjunct Tutorial in Writing (2 credits per quarter) (2 credits). F**

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. May be repeated for credit. The Staff

**11B. Adjunct Tutorial in Writing (2 credits per quarter) (2 credits). W**

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. May be repeated for credit. The Staff

**11C. Adjunct Tutorial in Writing (2 credits per quarter) (2 credits). S**

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. May be repeated for credit. The Staff

**20. The Nature of Written Discourse. W**

Explores the dynamics of written language: its relationships to speech, thought, and culture; its uses in different personal, academic, professional, and public contexts; its abuses in jargon and propaganda. Course work includes extensive practice in different kinds of writing. Enrollment restricted to students who have not passed the Entry Level Writing Requirement. Open to others by permission of instructor. Enrollment limited to 22. The Staff

**21. Meaning and Style: The Sentence in Context. S**

Explores, via cross-cultural readings, the nature, uses, and abuses of language. Course work includes extensive writing, both take-home and in-class. Emphasis on revising for power of expression and for variety and accuracy at the sentence level. Enrollment restricted to students who have not

passed the Entry Level Writing Requirement. Open to others by permission of instructor. Enrollment limited to 22. The Staff

**22A. Grammar and Editing Workshop (3 credits). F**

Offers instruction on selected topics in grammar and conventions of written English as needed to strengthen the writing skills of students whose primary language is not standard English. Provides students practice in applying these concepts to editing their own writing. Designed for entering first-year students. Enrollment restricted to first-year students. Enrollment limited to 22. The Staff

**22B. Grammar and Editing Workshop (3 credits). W,S**

Offers instruction on selected topics in grammar and conventions of written English as needed to strengthen the writing skills of students whose primary language is not standard English. Provides students practice in applying these concepts to editing their own writing. Designed for continuing students who have already taken course 20 and/or 21. Enrollment limited to 22. The Staff

**23. Grammar and Rhetoric: Language for Writing. F**

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. Enrollment restricted to fourth-quarter students who have not passed the Entry Level Writing Requirement. Open to others by permission of instructor. Enrollment limited to 22. The Staff

## Writing Program

### **24. Writing for Academic Purposes. F,W,S**

Addresses reading college-level materials and writing college-level paragraphs and short essays. Enrollment is by interview only. Enrollment is restricted to incoming frosh of whom the TOEFL is required for entrance to UCSC. The Staff

### **25. Writing About Place. F,W,S**

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(s): course 24 or placement via examination and interview. The Staff

### **26. Writing About Language. F,W,S**

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(s): course 25 or placement by examination and interview. The Staff

### **27. Writing About Genre. F,W,S**

Using the theme of "Rhetoric and Genre," this course prepares students to transfer into the mainstream composition curriculum by training them to analyze, understand, assess, and successfully produce different genres of writing. Upon passing this course, students satisfy the Entry-level Writing Requirement (ELWR). Prerequisite(s): course 26 or placement by examination and interview. The Staff

### **42. Student-Directed Seminar.**

Seminars taught by upper-division students under faculty supervision. (See course 192.) The Staff

### **64. Newswriting Workshop. \***

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. Enrollment limited to 22. (General Education Code(s): W.) The Staff

### **70. Communication and Rhetoric: An Introduction. \***

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(s): satisfaction of the Entry Level Writing requirement. The Staff

### **93. Field Study. F,W,S**

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. May be repeated for credit. The Staff

### **93F. Field Study (2 credits). F,W,S**

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. May be repeated for credit. The Staff

### **99. Tutorial. F,W,S**

Individual, directed study for lower-division students in expository writing, editing, or journalism. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **99F. Tutorial (2 credits). F,W,S**

Individual, directed study for lower-division students in expository writing, editing, or journalism. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## UPPER-DIVISION COURSES

### **101. Introduction to the History, Theory, and Practice of Rhetoric. W**

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(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to college members. (General Education Code(s): W.) The Staff

### **102. The Rhetoric of the Social Sciences. \***

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(s): satisfaction of the

## Writing Program

Entry Level Writing and Composition requirements. (General Education Code(s): W.) The Staff

### **103. Rhetoric of the Natural Sciences. \***

This course explores writing genres within the natural sciences. Emphasis is on the relationships between good science and good writing, clear thinking and clear writing. Frequent papers and substantive revisions required. Prerequisite(s): completion of 10 units coursework in the natural sciences, satisfaction of the Entry Level Writing and Composition requirements. Enrollment restricted to juniors and seniors during priority enrollment. Enrollment limited to 30. (General Education Code(s): W.) The Staff

### **104. Writing in the Arts. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 30. (General Education Code(s): W.) The Staff

### **106. Public Speaking. \***

Students learn strategies to write, analyze, and deliver effective speeches of various kinds as well as professional presentations using PowerPoint and other visuals. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 25. The Staff

### **107. Technical and Business Writing: An Overview. \***

An exploration of the conventions and formats of business and technical writing. Course work involves writing effective resumes, proposals, letters, end-user manuals, and the fundamentals of Web site design. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 30. The Staff

### **108. Electronic Communication. \***

An introduction to the evolving conventions of effective Web site design as well as collaborative writing. Course work includes evaluation of Web site content and structure and creation of hypertext. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 24. The Staff

### **109. Argument and Practical Reasoning. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 40. The Staff

### **110A. Writing in the Professions. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 40. (General Education Code(s): W.) The Staff

### **120. Editing English Prose. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 40. The Staff

### **159. Grammar for Tutors and Teachers (3 credits). W**

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(s): course 169, or by instructor permission. Enrollment limited to 45. The Staff

### **161. Academic Writing and Research Methods. \***

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. Course 161 includes sections for re-entry women, transfer students, and students in the EOP Faculty Mentor Program. Prerequisite(s):

## Writing Program

satisfaction of Entry Level Writing and Composition requirements. Students should contact the instructor for enrollment information. Enrollment limited to 20. (General Education Code(s): W.) The Staff

### **163. Advanced Workshop in Expository Writing. \***

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(s): satisfaction of the Entry Level Writing and Composition requirements. Enrollment limited to 22. May be repeated for credit. (General Education Code(s): W.) The Staff

### **165. Practicum in Reporting. \***

In-depth, community-based reporting, with an emphasis on skills ranging from interviewing techniques to profiles, integrating research with writing. Students choose a specific area or "desk" of concentration, and all the stories reflect that beat. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; a writing sample, completed in class, is required at first class meeting. Enrollment restricted to journalism minors during priority enrollment. Enrollment limited to 22. (General Education Code(s): W.) The Staff

### **166. Topics in Journalism. \***

Courses under this heading explore fields of newspaper and magazine journalism: feature writing, investigative reporting, reviewing, commentary, etc. Students study published writing and hone their own skills as writers under the

supervision of a practicing journalist. See the Schedule of Classes for specific offerings. The Staff

### **166A. Magazine Writing. \***

Introduces students to the various forms of magazine writing, as well as to pertinent reporting techniques. Students work intensively on process, style, and editing, producing numerous formal and informal pieces. Enrollment priority will be given to journalism minors. Students produce a writing sample on the first day of class. Prerequisite(s): satisfaction of Entry Level Writing and Composition requirements; course 64 or permission of instructor. Enrollment limited to 22. (General Education Code(s): W.) The Staff

### **166B. Investigative Reporting. \***

Students acquire basic investigative and research skills, with particular emphasis on how to develop investigative subjects, obtain data, check accuracy, and convert information into well written, publishable articles. Priority given to students concentrating in journalism. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; interview with instructor to review journalism portfolio. Enrollment limited to 22. (General Education Code(s): W.) The Staff

### **166D. Minorities in Journalism. \***

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. Enrollment limited to 22. (General Education Code(s): W.) The Staff

### **166J. Online Journalism. \***

A course in using electronic sources to report articles for publication and in publishing journalistic pieces online. Prerequisite(s): course 64 or journalism experience; instructor determination at first class meeting. Enrollment limited to 25. The Staff

### **166N. The Rhetoric of Radio. \***

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. Enrollment limited to 25. The Staff

### **167. Making the News. \***

A writing course examining news and feature articles in popular print media. Students write their own articles and analyze how a particular content is mandated by conventional forms, by the structure of the industries, and by ideas of "newsworthiness." Designed for journalism minors and students for whom a course in media criticism is central to their program. Prerequisite(s): satisfaction of the Entry Level Writing and Composition requirements; qualifications determined by instructor at first class meeting. Enrollment limited to 43. (General Education Code(s): W.) The Staff

### **169. Theory and Practice of Tutoring Writing (3 credits). F**

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): instructor determination at first

## Writing Program

class meeting; course intended for writing tutors only. Enrollment limited to 30. (General Education Code(s): PR-S.) The Staff

### **180. Seminar in Editing and Publishing. \***

Newswriting 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. Enrollment limited to 40. May be repeated for credit. The Staff

### **189. Methods of Teaching Writing. \***

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. May be repeated for credit. The Staff

### **191. Internships.**

Individual work in journalism, publishing, or broadcasting. Internships require a contracted amount of writing or other work, and generally involve group tutorials with faculty in the Writing Program as well as individual conferences. The Staff

### **191A. Internship in Writing. F,W,S**

Regular writing for newspaper or magazine. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **191B. Internship in Editing. F,W,S**

Work in an editorial position involving critique and guidance of reporters. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **191C. Internship in Publishing. F,W,S**

All phases of work for a publishing house, from manuscript reading to editorial. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **191D. Internship in Broadcasting. F,W,S**

Writing, editing, scheduling, and/or broadcast work for television or radio. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **192. Directed Student Teaching. F,W,S**

Teaching of a lower-division seminar under faculty supervision. (See course 42.) Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **193. Field Study. F,W,S**

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. The Staff

### **193F. Field Study (2 credits). F,W,S**

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. May be repeated for credit. The Staff

### **194. Group Tutorial. F,W,S**

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. Enrollment limited to 15. May be repeated for credit. The Staff

### **195. Senior Thesis. F,W,S**

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. May be repeated for credit. The Staff

### **196. Developing and Editing Field Documentation (2 credits). \***

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. Enrollment limited to 20. The Staff

### **198. Independent Field Study. F,W,S**

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. May be repeated for credit. The Staff

## Writing Program

### **198F. Independent Field Study (2 credits). F,W,S**

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. May be repeated for credit. The Staff

### **199. Tutorial. F,W,S**

Individual, directed study for upper-division students in expository writing, editing, or journalism. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

### **199F. Tutorial (2 credits). F,W,S**

Individual, directed study for upper-division students in expository writing, editing, or journalism. Students submit petition to sponsoring agency. May be repeated for credit. The Staff

## GRADUATE COURSES

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### **202. Writing and Learning Seminar (3 credits). \***

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. Enrollment restricted to graduate students. Enrollment limited to 30. The Staff

### **203. Teaching Writing. W**

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. Enrollment restricted to graduate students. Enrollment limited to 18. The Staff

\* Not offered in 2015-16

Revised: 09/01/15

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# YIDDISH

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2015-16 General Catalog

Department of Languages and Applied Linguistics

218 Cowell College

(831) 459-2054

<http://language.ucsc.edu>

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## PROGRAM DESCRIPTION

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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.

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### CAMPUS LANGUAGE LABORATORIES AND PLACEMENT EXAMS

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Information about these topics can be found under Department of Languages and Applied Linguistics.

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## YIDDISH COURSES

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### LOWER-DIVISION COURSES

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#### **1. First-Year Yiddish.**

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. (Formerly Introduction to Yiddish.) The Staff

#### **2. First-Year Yiddish. \***

Follows course 1 (formerly Hebrew 10), 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. (Formerly Introduction to Yiddish.)  
Prerequisite(s): course 1 or Hebrew 10 or by consent of instructor. The Staff

#### **99F. Tutorial (2 credits).**

**F,W,S**

Students submit petition to sponsoring agency. May be repeated for credit. The Staff

\* Not offered in 2015-16

Revised 09-01-15

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# TEACHING AND ADMINISTRATIVE STAFF

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2015-16 General Catalog

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## TEACHING STAFF

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Faculty titles for 2015–16 were verified as of July 31, 2015, 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 2015–16 academic years. 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, academic title, degrees, and former affiliations.

**Martin Abadi, Stevenson College (2001)**

Professor Emeritus, Computer Science  
B.S., M.S., Ph.D., Stanford University. Former affiliations: Systems Research Center, Compaq; Bell Labs Research; Lucent Technologies.

**Lamis Abdelaaty (2013)**

Acting Assistant Professor, Politics  
B.A., M.A., American University in Cairo; M.A., McGill University; Ph.D., Princeton University.

**Ralph H. Abraham, Kresge College (1968)**

Professor Emeritus, Mathematics  
B.S.E., M.S., Ph.D., University of Michigan. Former affiliations: Princeton University; Columbia University; University of California, Berkeley.

**W E. Abraham, Cowell College (1973)**

Professor Emeritus, Philosophy  
B.A., University of London; M.A., B.Phil., Oxford University. Former affiliations: Macalester College; University of Ghana; University of California, Berkeley; Stanford University.

**Elizabeth S. Abrams, Porter College (2000)**

Lecturer, Writing  
A.B., University of California, Berkeley; M.A., M.Phil., Yale University. Former affiliation: Harvard Expository Writing Program.

**Zsuzsanna Abrams (2010)**

Associate Professor, German Language  
B.A., University of Wisconsin, Eau Claire; M.A., Ph.D., University of Tucson. Former affiliations: University of Texas at Austin.

**Demetrios Achlioptas (2005)**

Professor, Computer Sciences  
B.Eng., University of Patras; M.Sc., Ph.D., University of Toronto. Former affiliations: Microsoft research, Redmond, WA..

**Robert Adams, Crown College (1967)**

Professor Emeritus, Economics  
B.A., Oberlin College; M.A., Ph.D., University of Michigan. Former affiliations: University of Pittsburgh; University of Maryland.

**Anthony N. Aguirre (2003)**

Professor, Physics  
B.A., Brown University; M.A., Ph.D., Harvard University. Former affiliation: Institute for Advanced Study (Princeton).

**Julia M. Aguirre (2001)**

Assistant Professor, Education  
B.A., University of California, Berkeley; M.A., University of Chicago; Ph.D., University of California, Berkeley.

**Patrick P. Aherne, Porter College (1966)**

Professor Emeritus, Art  
B.F.A., University of Kansas; M.A., Northwestern University. Former affiliation: Artist-in-Residence, Kings Canyon and Sequoia National Parks.

**Judith L. Aissen, Stevenson College (1983)**

Research Professor Emerita, Linguistics  
B.A., Fordham University; M.A., Yale University; Ph.D., Harvard University. Former affiliations: University of California, Los Angeles; Yale University; University of California, Santa Barbara.

**Joshua Aizenman, College Nine (2001)**

Professor Emeritus, Economics  
B.A., M.A., Hebrew University of Jerusalem; Ph.D., University of Chicago. Former affiliations: University of Pennsylvania; University of Chicago; Hebrew University of Jerusalem; Dartmouth College.

**Ramakrishna Akella (2003)**

Professor, Information Systems Management

## Teaching and Administrative Staff

B.S., Indian Institute of Technology; Ph.D., Indian Institute of Science. Former affiliations: State University of New York at Buffalo; Carnegie Mellon University.

### **Mark A. Akeson (1996)**

Professor, Biomolecular Engineering  
B.A., University of California, San Diego; Ph.D., University of California, Davis.. Concurrent Affiliation: Former affiliations: University of California, Santa Cruz; National Institutes of Health; University of California, Davis..

### **Nameera N. Akhtar, Crown College (1995)**

Professor, Psychology  
B.S., M.S., Ph.D., Dalhousie University (Canada).

### **Jorge Aladro Font, Merrill College (1992)**

Professor, Spanish Literature  
M.A., University of Barcelona; Ph.D., State University of New York at Albany. Former affiliations: Skidmore College; State University of New York at Albany.

### **Peter Aldhous**

Lecturer in Science Writing  
B.S., University of Bristol, England; Ph.D., University of Nottingham, England.

### **Eric Aldrich (2012)**

Assistant professor, Economics  
B.S., Duke University; M.S., University of Washington; M.A., Ph.D., Duke University. Former Affiliations: Federal Reserve Bank of Atlanta; Duke University.

### **Mark Amengual (2014)**

Assistant Professor, Languages and Applied Linguistics  
Ph.D., University of Texas at Austin; M.A., Pennsylvania State University; B.A. (Llicenciatura), Universitat de les Illes Balears.

### **George T. Amis, Cowell College (1965)**

Professor Emeritus, English Literature  
B.A., Amherst College; M.A., Ph.D., Yale University.  
Former affiliations: Yale University; Williams College.

### **Pranav Anand, Stevenson College (2006)**

Associate Professor  
A.B., Harvard University; Ph.D., MIT.

### **Elliot W. Anderson, Porter College (1997)**

Associate Professor, Art  
B.A., M.A., San Francisco State University. Former affiliation: San Francisco Art Institute.

### **Mark D. Anderson, Merrill College (2003)**

Associate Professor, Anthropology  
B.A., University of North Carolina at Chapel Hill; M.A., Ph.D., University of Texas at Austin. Former affiliation: University of Chicago.

### **Roger W. Anderson, Porter College (1968)**

Professor Emeritus, Chemistry and Biochemistry  
B.A., Carleton College; M.A., Ph.D., Harvard University.

### **Frank C. Andrews, Merrill College (1967)**

Professor Emeritus, Chemistry and Biochemistry  
B.S., Kansas State University; M.A., Ph.D., Harvard University. Former affiliation: University of Wisconsin.

### **Lawrence Andrews, Porter College (1991)**

Associate Professor, Film and Digital Media  
B.F.A., San Francisco Art Institute.

### **Karen L. Andrie (1993)**

Lecturer, Music (Cello)  
B.M., Performer's Certificate, Eastman School of Music. Concurrent affiliations: Cabrillo College; Popper-Keizer Summer Music Conservatory; Santa Cruz Chamber Players; Santa Cruz New Music Works; Monterey Symphony.

### **David H. Anthony, Oakes College (1988)**

Associate Professor, History  
A.B., New York University; A.M., Ph.D., University of Wisconsin-Madison. Former affiliation: University of Oregon.

### **Bettina F. Aptheker, Kresge College (1979)**

Professor, Feminist Studies and History  
B.A., University of California, Berkeley; M.A., San Jose State University; Ph.D., University of California, Santa Cruz. Former affiliation: San Jose State University.

### **Dane Archer, Stevenson College (1972)**

Professor Emeritus, Sociology  
B.A., Yale University; M.A., Ph.D., Harvard University.

### **Sondra M. Archimedes (2004)**

Lecturer, Writing  
B.A., M.A., San Francisco State University; Ph.D., University of California, Santa Cruz.

### **Manuel Ares, Porter College (1987)**

Professor, Molecular, Cell, and Developmental Biology  
B.S., Cornell University; Ph.D., University of California, San Diego. Former affiliation: Yale University.

## Teaching and Administrative Staff

### **Anjali R. Arondekar, Kresge College (2000)**

Associate Professor, Feminist Studies  
I.B., Armand Hammer United World College; B.A.,  
Cornell University; Graduate Certificate, Ph.D.,  
University of Pennsylvania.

### **Elliot Aronson, Stevenson College (1974)**

Professor Emeritus, Psychology  
B.A., Brandeis University; M.A., Wesleyan University;  
Ph.D., Stanford University. Former affiliations: Harvard  
University; University of Minnesota; University of Texas  
at Austin.

### **Gabriela F. Arredondo, Merrill College (1998)**

Associate Professor, Latin American and Latino Studies  
B.A., Reed College; M.A., San Francisco State University;  
Ph.D., University of Chicago.

### **Derede L. Arthur (2001)**

Lecturer, Writing  
M.A., Stanford University. Former affiliations: Santa  
Clara University; De Anza College; Cogswell College,  
Sunnyvale.

### **Doris B. Ash, Porter College (2000)**

Associate Professor, Education  
B.S., M.S., Cornell University; Ph.D., University of  
California, Berkeley. Former affiliation: San Francisco  
Exploratorium.

### **Noriko Aso, Merrill College (1998)**

Assistant Professor, History  
B.A., Yale University; M.A., Ph.D., University of Chicago.  
Former affiliation: Portland State University.

### **Erik Asphaug, College Eight (1998)**

Professor Emeritus, Earth and Planetary Sciences  
B.A., Rice University; Ph.D., University of Arizona,  
Tucson. Former affiliations: SETI Institute; NASA Ames  
Research Center.

### **Neda Atanasoski (2008)**

Associate Professor, Feminist Studies  
B.A., University of Minnesota Twin Cities; M.A., Ph.D.,  
University of California, San Diego. Concurrent  
Affiliation: Former affiliations: SUNY Stony Brook  
University.

### **Charles O. Atkinson, Porter College (1978)**

Lecturer, Creative Writing  
B.A., Amherst College; M.A., Ph.D., University of  
California, Santa Cruz. Former affiliation: Hampshire  
College.

### **William B. Atwood (2001)**

Adjunct Professor, Physics  
B.S., California Institute of Technology; Ph.D., Stanford  
University. Former affiliation: Stanford Linear  
Accelerator Center.

### **Margarita Azmitia, Cowell College (1989)**

Professor, Psychology  
B.A., M.A., University of North Carolina at Greensboro;  
Ph.D., University of Minnesota. Former affiliation:  
Florida International University.

### **Delbert D. Bailey (2004)**

Research Associate, Computer Science  
B.S., Portland State University; M.S., Ph.D. University of  
California, Santa Cruz. University of Oregon, Medical  
School.

### **Mark Baker (2000)**

Lecturer, Writing  
B.A., University of California, Irvine; M.A., San Francisco  
State University. Former affiliation: San Francisco State  
University.

### **John C. Balachandra (2009)**

Adjunct Professor, Electrical Engineering  
B.S., University of Sri Lanka; M.S., Ph.D., Texas A&M  
University. Former affiliations: Distributed Power &  
Electronics Center; California State University,  
Sacramento..

### **Gopal Balakrishnan, Oakes College (2006)**

Associate Professor, History of Consciousness  
B.A., Cornell University; M.A., University of California,  
Los Angeles; Ph.D., University of California, Los Angeles.  
University of Chicago.

### **Thomas I. Banks (1986)**

Professor, Physics  
B.A., Reed College; Ph.D., Massachusetts Institute of  
Technology.. Former affiliations: Stanford Linear  
Accelerator Center; Tel Aviv University; Institute for  
Advanced Study (Princeton); Rutgers University..

### **Karen M. Barad, Kresge College (2005)**

Professor, Feminist Studies  
B.A., Brandeis University; Ph.D., State University of New  
York at Stony Brook. Concurrent Affiliation: Former  
affiliations: Mount Holyoke College, Rutgers University,  
Pomona College, Barnard College.

### **Byron A. Barahona (2014)**

Lecturer, Languages and Applied Linguistics

## Teaching and Administrative Staff

Ph.D., University of California, Berkeley; B.A., University of Massachusetts.

### **Brenda Barcelo, Merrill College (1995)**

Lecturer, Spanish Language  
B.A., M.A., University of California, Santa Barbara.  
Former affiliations: Cuesta College; Alianza Cultural Uruguay-U.S.A. (Montevideo).

### **Brandin S. Baron, Porter College (2006)**

Associate Professor, Theater Arts  
B.A., Indiana University School of Music; M.F.A.,  
University of California, San Diego. Former affiliation:  
The Academy of Art University, San Francisco.

### **Lora Bartlett (2004)**

Associate Professor, Education  
B.A., M.Ed., University of Massachusetts, Amhurst; Ph.D.,  
University of California, Berkeley. Former affiliation:  
University of London.

### **Karen L. Bassi, Cowell College (1988)**

Professor, Classics (Literature)  
B.A., University of California, Santa Cruz; Ph.D., Brown  
University. Former affiliations: Syracuse University;  
University of Rhode Island; Brown University.

### **Dilip K. Basu, Merrill College (1971)**

Professor Emeritus, History  
B.A., M.A., Calcutta University; M.A., Harvard University;  
Ph.D., University of California, Berkeley. Former  
affiliations: University of Michigan; University of  
California, Berkeley.

### **Frank Bauerle (1994)**

Lecturer, Mathematics  
B.A., Technische Hochschule Karlsruhe; M.A., Ph.D.,  
University of California, San Diego. Former affiliations:  
Monash University; Cornell University.

### **Murray Baumgarten, Kresge College (1966)**

Professor, English and Comparative Literature; Neufeld  
Levin Professor, Holocaust Studies  
B.A., Columbia University; M.A., Ph.D., University of  
California, Berkeley. Former affiliations: Hebrew  
University of Jerusalem; Williams College; University of  
California Education Abroad Program (Jerusalem).

### **Amy C. Beal, Porter College (2001)**

Professor, Music  
B.M., M.M., University of Kansas; M.A., Ph.D., University  
of Michigan. Former affiliation: Bates College.

### **Michael W. Beck (2007)**

Assistant Adjunct Professor  
Ph.D., Florida State University.

### **Jonathan F. Beecher, Stevenson College (1970)**

Professor Emeritus, History  
B.A., Ph.D., Harvard University. Former affiliations:  
Harvard University; Ecole Normale d'Instituteurs  
(France).

### **David P. Belanger, College Eight (1984)**

Professor, Physics  
B.S., M.S., Georgia Institute of Technology; Ph.D.,  
University of California, Santa Barbara.

### **Dorian Bell (2010)**

Assistant Professor, Literature  
B.A., Cornell University; M.A., Ph.D., University of  
Pennsylvania. Former affiliations: University of  
California, Irvine; Stanford University.

### **Victoria M. Bellotti (2012)**

Adjunct Professor, Computer Engineering  
Ph.D., Queen Mary and Westfield College, London  
University.

### **Ilan Benjamin, Stevenson College (1989)**

Professor, Chemistry and Biochemistry  
B.Sc., Ph.D., Hebrew University of Jerusalem. Former  
affiliation: University of California, San Diego.

### **Harry Berger, Cowell College (1965)**

Professor Emeritus, English Literature and History of  
Art and Visual Culture  
B.A., Ph.D., Yale University. Former affiliation: Yale  
University.

### **Martin A. Berger, Porter College (2004)**

Professor, History of Art and Visual Culture  
B.A., Wesleyan University; M.A., M.Phil., Ph.D., Yale  
University. Former affiliations: Colby College;  
University of North Carolina at Chapel Hill;  
Northwestern University; State University of New York  
at Buffalo; Yale University.

### **Ralph J. Berger, Cowell College (1967)**

Professor Emeritus, Ecology and Evolutionary Biology  
B.A., M.A., Cambridge University; Ph.D., University of  
Edinburgh. Former affiliations: University of  
Edinburgh; National Institute of Neurological Diseases  
and Blindness; University of Puerto Rico; University of  
California, Los Angeles.

## Teaching and Administrative Staff

### **Robert F. Berkhofer, Merrill College (1991)**

Professor Emeritus, History  
B.A., State University of New York at Albany; M.A., Ph.D., Cornell University. Former affiliations: University of Michigan, Ann Arbor; University of Wisconsin-Madison; University of Minnesota.

### **Abraham N. Berman (2007)**

Lecturer, Mathematics  
B.A., Humboldt State University; M.A., Ph.D., University of California, Santa Cruz. Former affiliation: Humboldt State University, Cabrillo College.

### **Nathaniel A. Berman (2007)**

Lecturer, Music (Concert Choir)  
B.A., M.A., University of California, Santa Cruz. Former affiliation: Robert Louis Stevenson High School, Pebble Beach.

### **Phillip W. Berman (2006)**

Distinguished Professor of Biomolecular Engineering,  
Biomolecular Engineering  
A.B., University of California, Berkeley; P.h.D., Dartmouth Medical School.. Concurrent Affiliation: Global Solutions for Infectious Diseases. Genentech; VaxGen.

### **Giacomo Bernardi (1994)**

Associate Professor, Ecology and Evolutionary Biology  
B.S. (Maitrise), M.Sc. (D.E.A.), Ph.D. (These d'Universite), University of Paris. Former affiliations: Institut Jacques Monod (Paris); Hopkins Marine Station, Stanford University.

### **Claude F. Bernasconi, Merrill College (1967)**

Professor, Chemistry and Biochemistry  
Diploma, Ph.D., Swiss Federal Institute of Technology (ETH) (Zurich). Former affiliation: Max Planck Institute for Biophysical Chemistry (Gottingen).

### **Rebecca A. Bernstein (2007)**

Associate Professor  
B.A., Princeton; Ph.D., California Institute of Technology. Carnegie Observatories; University of Michigan.

### **Eva C. Bertram, Merrill College (2003)**

Assistant Professor, Politics  
B.A., Swarthmore College; M.A., M.Phil., Ph.D. cand., Yale University.

### **Julie Bettie, College Eight (1997)**

Associate Professor, Sociology  
B.S., Boise State University; M.A., Ph.D., University of

California, Davis.

### **Needhi Bhalla (2008)**

Assistant Professor  
B.A., Columbia College, New York; Ph.D., University of California. University of California, Berkeley.

### **Nandini Bhattacharya (2010)**

Lecturer, Mathematics  
B.A., Bryn Mawr College; M.A., University of California, Santa Cruz. Former affiliations: Academic Excellence (ACE) Program, University of California, Santa Cruz; Cabrillo College.

### **Zhixi Bian (2008)**

Assistant Adjunct Professor  
B.S., Nankai University; M.S., Beijing University; Ph.D., University of California, Santa Cruz. Former affiliations: Vishay Siliconix; Beijing University..

### **James H. Bierman, Cowell College (1973)**

Professor, Theater Arts (Drama)  
B.A., Princeton University; Diplome, University of Paris, Sorbonne; Ph.D., Stanford University. Former affiliations: Smith College; Amherst College.

### **Raoul Birnbaum, Kresge College (1991)**

Patricia and Rowland Rebele Professor, History of Art and Visual Culture  
B.A., College of the City of New York; M.A., M.Phil., Ph.D., Columbia University. Former affiliations: University of Iowa; Princeton University; Harvard University; Metropolitan Museum of Art.

### **Andrew H. Bivens (2008)**

Assistant Professor, Literature  
B.A., Bard College; Ph.D., University of Chicago. Former affiliation: Moravian College.

### **Chelsea Blackmore (2010)**

Assistant Professor, Anthropology  
B.A., Georgia Southern University, Statesboro; M.A., Florida State University, Tallahassee; Ph.D., University of California, Riverside.

### **George R. Blumenthal, Oakes College (1972)**

Chancellor; Professor, Astronomy and Astrophysics  
B.S., University of Wisconsin-Milwaukee; Ph.D., University of California, San Diego.

### **Peter H. Bodenheimer, Stevenson College (1967)**

Professor, Astronomy and Astrophysics; Astronomer, UC Observatories/Lick Observatory

## Teaching and Administrative Staff

B.A., Harvard University; Ph.D., University of California, Berkeley.

### **Hanns H. Boeger (2006)**

Assistant Professor, Molecular, Cell, and Developmental Biology

B.S., M.S., Christian-Albrecht University; Ph.D., Max Planck Institute for Biophysical Chemistry; post-doctorate, Stanford University. Former affiliation: Stanford University Medical School.

### **Roberto A. Bogomolni, Porter College (1988)**

Professor, Chemistry and Biochemistry

Diploma, University of Buenos Aires; Ph.D., University of California, Berkeley. Former affiliations: University of California, San Francisco; University of California, Berkeley.

### **Michael Bolte (1993)**

Professor, Astronomy and Astrophysics; Astronomer, UC Observatories/Lick Observatory

B.S., University of Central Florida; M.S., Florida State University; Ph.D., University of Washington. Former affiliations: NASA/Space Telescope Science Institute; Dominion Astrophysical Observatory.

### **Robert Boltje (1999)**

Professor, Mathematics

Dipl. Math., University of Munich; Dr. habil., Dr. rer. nat., University of Augsburg.

### **Douglas G. Bonett (2012)**

Professor, Psychology

B.A., California State University, Fresno; M.A., California State University, Long Beach; M.A., Ph.D., University of California, Los Angeles. Former affiliation: Iowa State University.

### **John G. Borrego, Merrill College (1974)**

Professor Emeritus, Latin American and Latino Studies

B.A., University of California, Berkeley; M.A., Washington University; M.C.P., Massachusetts Institute of Technology; Ph.D., University of California, Berkeley. Former affiliation: University of New Mexico.

### **John F. Bowin, Cowell College (2005)**

Associate Professor, Philosophy

B.A., M.B.A., M.A., University of Chicago; M.A., Ph.D., University of Texas at Austin.

### **Barry J. Bowman, Oakes College (1979)**

Professor, Molecular, Cell, and Developmental Biology

B.A., University of Wisconsin; Ph.D., University of

Michigan. Former affiliation: Yale University.

### **Mark Brandenburg (1989)**

Lecturer, Music (Clarinet)

B.M., M.S., Juilliard School of Music.

### **Scott A. Brandt, Crown College (1999)**

Professor, Computer Science

B.S., M.S., University of Minnesota, Minneapolis; Ph.D., University of Colorado, Boulder.

### **Alexandre Brandwajn (1985)**

Professor, Computer Engineering

B.A., Docteur-Ingenieur, Docteur d'Etat, University of Paris. Former affiliations: Amdahl Corporation; Ecole Nationale Supérieure des Telecommunications (ENST) (Paris); Duke University.

### **Rebecca Braslau, Stevenson College (1991)**

Professor, Chemistry and Biochemistry

B.A., Reed College; Ph.D., University of Wisconsin-Madison. Former affiliation: Institut für Organische Chemie (Basel, Switzerland).

### **Adrian Brasoveanu (2008)**

Assistant Professor, Linguistics

B.A., M.A., University of Bucharest; Ph.D., Rutgers University.

### **Donald L. Brenneis, Cowell College (1996)**

Professor, Anthropology

B.A., Stanford University; Ph.D., Harvard University. Former affiliation: Pitzer College.

### **Bruce Bridgeman, College Eight (1973)**

Professor Emeritus, Psychology and Psychobiology

B.A., Cornell University; Ph.D., Stanford University. Former affiliations: Free University of Berlin; University of California, Berkeley.

### **Frank G. Bridges, Stevenson College (1970)**

Professor Emeritus, Physics

B.Sc., M.Sc., University of British Columbia; Ph.D., University of California, San Diego. Former affiliation: University of California, San Diego.

### **Jean P. Brodie, Cowell College (1987)**

Professor, Astronomy and Astrophysics; Astronomer, UC Observatories/Lick Observatory

B.Sc., University of London; Ph.D., Cambridge University. Former affiliation: University of California, Berkeley.

## Teaching and Administrative Staff

### **Emily E. Brodsky (2006)**

Associate Professor, Earth and Planetary Sciences  
A.B., Harvard University; Ph.D., California Institute of  
Technology. Former affiliation: University of California,  
Los Angeles.

### **Joyce E. Brodsky, Porter College (1992)**

Professor Emerita, Art  
B.A., Brooklyn College; M.A., New York University; Ph.D.  
cand., Yale University; Ecole du Louvre. Former  
affiliation: University of Connecticut.

### **Jamie L. Bronstein (2006)**

Visiting Associate Professor, History  
Ph.D., Stanford University. Former affiliation: New  
Mexico State University.

### **Eileen L. Brooks, College Nine (2001)**

Assistant Professor, Economics  
B.S., Massachusetts Institute of Technology; M.Litt.,  
Oxford University; A.M., Ph.D., Harvard University.

### **Margaret R. Brose, Cowell College (1978)**

Professor Emerita, Italian and Comparative Literature  
B.A., Wayne State University; M.A., Ph.D., Harvard  
University. Former affiliations: Yale University;  
University of Colorado.

### **George S. Brown, Porter College (1990)**

Professor Emeritus, Physics; Vice Provost, Academic  
Affairs  
B.S., California Institute of Technology; M.S., Ph.D.,  
Cornell University. Former affiliations: Cornell  
University; Bell Laboratories; Stanford University;  
Stanford Synchrotron Radiation Laboratory.

### **Michael K. Brown, Merrill College (1982)**

Emeritus, Politics  
B.A., University of Oregon; M.P.A., Ph.D., University of  
California, Los Angeles. Former affiliation: Virginia  
Polytechnic Institute and State University.

### **Kenneth W. Bruland, Crown College (1974)**

Professor Emeritus, Ocean Sciences  
B.A., Western Washington State College; Ph.D., Scripps  
Institution of Oceanography, University of California,  
San Diego.

### **Nicholas H. Brummell (2006)**

Professor, Applied Mathematics and Statistics  
B.Sc., Imperial College, London, UK; D.I.C., Imperial  
College, London, UK; Ph.D., Imperial College, London,  
UK. JILA and the Department of Astrophysical and

Planetary Sciences, University of Colorado, Boulder..

### **David T. Brundage, College Eight (1985)**

Professor, History  
B.A., Reed College; M.A., University of Warwick  
(England); Ph.D., University of California, Los Angeles.  
Former affiliation: Research Foundation, Graduate  
Center of the City University of New York.

### **Heather E. Bullock, College Ten (1999)**

Professor, Psychology  
B.A., Allegheny College; M.A., Ph.D., University of Rhode  
Island. Former affiliation: Nebraska Wesleyan  
University.

### **George Bulman (2013)**

Acting Assistant Professor, Economics  
B.S., Haverford College; Ph.D., Stanford University.

### **George Bunch, College Ten (2004)**

Associate Professor, Education  
B.A., Georgetown University; M.A., University of  
Maryland, Baltimore County; Ph.D., Stanford University.  
Former affiliation: Stanford University.

### **Joseph F. Bunnett, Crown College (1966)**

Professor Emeritus, Chemistry and Biochemistry  
B.A., Reed College; Ph.D., University of Rochester.  
Former affiliations: Reed College; University of North  
Carolina; Brown University.

### **Victor Burgin, Oakes College (1988)**

Professor Emeritus, History of Consciousness  
A.R.C.A., Royal College of Art (London); M.F.A., Yale  
University. Former affiliation: Polytechnic of Central  
London.

### **Peter N. Burgoyne (1967)**

Professor Emeritus, Mathematics  
B.Sc., M.Sc., McGill University; Ph.D., Princeton  
University. Former affiliations: Princeton University;  
University of California, Berkeley; University of Illinois,  
Chicago.

### **Edmund Burke, Merrill College (1968)**

Professor, History; UC Presidential Chair  
B.A., University of Notre Dame; M.A., Ph.D., Princeton  
University.

### **Linda C. Burman-Hall, Porter College (1975)**

Professor Emeritus, Music  
B.A., University of California, Los Angeles; M.F.A., Ph.D.,  
Princeton University.

## Teaching and Administrative Staff

### **Catherine E. Burns (2013)**

Adjunct Associate Professor, Environmental Studies  
B.S., Emory University; Ph.D., Yale.

### **Julianne Burton-Carvajal, Merrill College (1974)**

Professor Emerita, Literature  
B.A., Denison University; M.Phil., Ph.D., Yale University.  
Former affiliation: University of Texas.

### **Jeffrey T. Bury, College Eight (2006)**

Associate Professor, Environmental Studies  
B.A., University of Utah; M.A., The American University;  
Ph.D., University of Colorado. Former affiliation:  
Department of Geography and Human Sciences, San  
Francisco State University.

### **Catherine C. Byrne (2004)**

Assistant Professor, Psychology  
B.A., Southern Oregon State College, Ashland; M.A.,  
University of Notre Dame; Ph.D., University of Nevada,  
Reno. Former affiliation: University of Pennsylvania,  
Solomon Asch Center for Study of Ethnopolitical  
Conflict.

### **Melissa L. Caldwell, College Eight (2004)**

Professor, Anthropology  
B.A., University of Tennessee; M.A., Indiana University;  
A.M., Ph.D., Harvard University. Former affiliations:  
Northeastern University; Harvard University.

### **Carlos Calierno, Merrill College (1990)**

Lecturer, Spanish Language  
M.A., San Francisco State University; law degree,  
Facultad De Ciencias Juridicas (Santa Fe, Argentina).

### **Maureen Callanan, Crown College (1989)**

Professor, Psychology  
A.B., Mount Holyoke College; Ph.D., Stanford University.  
Former affiliations: University of Texas at Austin;  
Lehigh University.

### **Elisabeth L. Cameron, Porter College (2001)**

Professor, Patricia and Rowland Rebele Chair in History  
of Art and Visual Culture (2008-2014)  
B.A., Agnes Scott College; M.A., Ph.D., University of  
California, Los Angeles. Former affiliation: Nelson-  
Atkins Museum of Art (Kansas City, Missouri).

### **Kenneth L. Cameron, Crown College (1973)**

Professor Emeritus, Earth and Planetary Sciences  
B.S., M.S., University of Houston; Ph.D., Virginia  
Polytechnic Institute and State University. Former  
affiliation: State University of New York at Stony Brook.

### **Walter I. Campbell (1989)**

Lecturer, German Language  
B.A., Whitman College; B.A., M.A., University of  
Washington.

### **Manel Camps, Crown College (2007)**

Associate Professor, Microbiology and Environmental  
Toxicology  
D.V.M., Autonomous University of Barcelona; M.A.,  
Autonomous University of Barcelona; Ph.D., Stanford  
University. University of Washington.

### **Charles J. Carlise, Merrill College (2004)**

Lecturer, Writing Program  
Ph.D., University of Houston; M.A., University of  
California, Davis; B.A., Wittenberg University,  
Springfield, Ohio. Former affiliation: University of  
Houston.

### **Mark H. Carr (1997)**

Associate Professor, Ecology and Evolutionary Biology  
B.A., University of California, Santa Cruz; M.S., San  
Francisco State University (Moss Landing Marine  
Laboratories); Ph.D., University of California, Santa  
Barbara. Former affiliations: Oregon State University;  
California Institute of Technology.

### **Benjamin L. Carson, College Eight (2003)**

Associate Professor, Music  
B.A., Willamette University; M.M., University of  
Washington, Seattle; Ph.D., University of California, San  
Diego. Former affiliations: University of California,  
Riverside; University of California, San Diego.

### **Sue A. Carter, Crown College (1995)**

Professor, Physics  
B.A., Kalamazoo College; Ph.D., University of Chicago.  
Former affiliations: AT&T Bell Laboratories; IBM-  
Almaden Research Center.

### **Pedro G. Castillo, Merrill College (1975)**

Professor Emeritus, History  
B.A., Arizona State University; M.A., Northern Arizona  
University; Ph.D., University of California, Santa  
Barbara. Former affiliations: University of California,  
Santa Barbara; Yale University.

### **Brian A. Catlos, Stevenson College (2002)**

Associate Professor, History  
B.A., M.A., Ph.D., University of Toronto. Former  
affiliation: Boston University.

## Teaching and Administrative Staff

### **Giulia Centineo, Cowell College (1987)**

Lecturer, Italian Language  
Laurea, Università degli Studi di Palermo (Italy); M.A., Ph.D. cand., University of California, Berkeley.

### **Martin M. Chemers, Porter College (1995)**

Professor Emeritus, Psychology  
B.S., M.S., Ph.D., University of Illinois, Urbana-Champaign. Former affiliations: Claremont McKenna College; Claremont Graduate School; University of Utah; University of Delaware.

### **Michael M. Chemers (2012)**

Associate Professor, Theater Arts  
M.F.A., Indiana University; Ph.D., University of Washington.

### **Bin Chen (2006)**

Assistant Professor, Molecular, Cell, and Developmental Biology  
Postdoctorate, Stanford University; Ph.D., SUNY Stony Brook; M.S. Beijing University; B.S., Beijing University. Former affiliation: Stanford University..

### **Christopher S. Chen (2012)**

Assistant Professor, Literature  
B.A., University of California, Berkeley; M.F.A., University of Iowa Writers Workshop; Ph.D., University of California, Berkeley. Former affiliations: Stanford University; University of California, Berkeley.

### **Nancy N. Chen, Crown College (1994)**

Professor, Anthropology  
B.A., Stanford University; M.A., Ph.D., University of California, Berkeley. Former affiliation: Tufts University.

### **Shaowei Chen (2004)**

Professor, Chemistry and Biochemistry  
B.S., University of Science and Technology of China; M.S., Ph.D., Cornell University. Former affiliation: Southern Illinois University at Carbondale.

### **Weixin Cheng, College Nine (1999)**

Professor, Environmental Studies  
B.S., Northeast Agricultural College (Harbin, China); Ph.D., University of Georgia.

### **Yin-Wong Cheung, Crown College (1990)**

Professor, Economics  
B.S., University of Hong Kong; M.A., University of Essex (England); Ph.D., University of Pennsylvania.

### **John B. Childs, College Ten (1987)**

Professor Emeritus, Sociology  
B.A., University of Massachusetts-Amherst; M.A., Ph.D., State University of New York at Buffalo. Former affiliations: National Academy of Sciences; Amherst College; Harvard University; Yale University.

### **Andrew Chisholm (1996)**

Professor, Molecular, Cell, and Developmental Biology  
B.A., Cambridge University; Ph.D., Medical Research Council Laboratory of Molecular Biology (Cambridge, England).

### **Alan S. Christy, Merrill College (1995)**

Associate Professor, History  
B.A., Carleton College; M.A., Ph.D., University of Chicago.

### **Patrick Y. Chuang (2001)**

Associate Professor, Earth and Planetary Sciences  
B.Sc., University of Alberta; M.S., Ph.D., California Institute of Technology. Former affiliation: National Center for Atmospheric Research.

### **Louis O. Chude-Sokei, Oakes College (1998)**

Associate Professor, Literature  
B.A., Ph.D., University of California, Los Angeles. Former affiliations: Bowdoin College; Occidental College.

### **Sandra Chung, Cowell College (1986)**

Professor, Linguistics  
A.B., Radcliffe College; Ph.D., Harvard University. Former affiliations: University of California, Los Angeles; University of California, San Diego.

### **Mark Cioc, Stevenson College (1989)**

Professor, History  
B.S., M.A., University of Wyoming; Ph.D., University of California, Berkeley. Former affiliation: University of Massachusetts-Amherst.

### **Matthew E. Clapham (2007)**

Associate Professor, Earth and Planetary Science  
B.Sc., University of British Columbia, Canada; M.Sc., Queen's University, Canada; Ph.D., University of Southern California. Queen's University, Ontario, Canada.

### **Annette M. Clear, College Nine (2001)**

Assistant Professor, Politics  
B.A., Yale University; M.A., M.A., Ph.D., Columbia University. Former affiliations: Asia Foundation; Carter Center for Human Rights; Indonesian Election Watch.

## Teaching and Administrative Staff

### **James T. Clifford, Oakes College (1978)**

Professor Emeritus, History of Consciousness  
B.A., Haverford College; M.A., Stanford University; Ph.D.,  
Harvard University; (Hon.) D. Litt. h.c., Haverford  
College. Former affiliation: Harvard University.

### **Rena V. Cochlin, Merrill College (1973)**

Faculty, Physical Education  
B.A., Barnard College; M.A., Columbia University.  
Former affiliations: Central Connecticut State College;  
East Los Angeles College; World Campus Afloat.

### **Robert S. Coe, Porter College (1968)**

Professor, Earth and Planetary Sciences  
B.A., Harvard University; M.A., Ph.D., University of  
California, Berkeley. Former affiliations: University of  
California, Berkeley; U.S. Geological Survey.

### **Christopher L. Connery, Oakes College (1990)**

Professor, Chinese Literature  
B.A., University of California, Santa Cruz; M.A., Ph.D.,  
Princeton University.

### **Michael J. Connor (2006)**

Adjunct Professor  
B.S., Stanford University; Ph.D., Woods Hole  
Oceanographic Institution/Massachusetts Institute of  
Technology. Executive Director, San Francisco Estuary  
Institute.

### **Charles Conroy (2012)**

Assistant Professor, Astronomy and Astrophysics  
Ph.D., Princeton University.. Former affiliation:  
Harvard-Smithsonian Center for Astrophysics.

### **Paul D. Contos (1997)**

Lecturer, Music (Saxophone)  
Concurrent Affiliation: Concurrent affiliations:  
California State University, Monterey Bay; Monterey  
Jazz Festival.. Former affiliations: Santa Cruz County  
Symphony; San Jose Civic Light Opera.

### **Ryan E. Coonerty**

Lecturer, Legal Studies  
B.A., University of Oregon; M.S., London School of  
Economics and Political Science; Juris Doctor,  
University of Virginia.

### **Catherine R. Cooper, Stevenson College (1987)**

Professor, Psychology and Education  
B.A., Pomona College; Ph.D., University of Minnesota at  
Minneapolis-St. Paul. Former affiliation: University of  
Texas at Austin.

### **Bruce N. Cooperstein, College Eight (1975)**

Professor, Mathematics  
B.A., Queens College, City University of New York; M.A.,  
Ph.D., University of Michigan. Former affiliation:  
University of Michigan.

### **Vilashini Cooppan, Oakes College (2003)**

Associate Professor, Literature  
B.A., Yale University; Ph.D., Stanford University. Former  
affiliation: Yale University.

### **David H. Cope, Porter College (1977)**

Professor Emeritus, Music  
B.M., Arizona State University; M.M., University of  
Southern California. Former affiliations: Miami  
University (Ohio); Kansas State College.

### **Mary J. Cope (1977)**

Lecturer, Music (Piano)  
B.A., Ohio Dominican College; M.M., Indiana University.  
Former affiliations: Cottey College; Kansas State  
College; Cleveland Institute of Music; Miami University  
(Ohio).

### **Melanie Cordan (2014)**

Lecturer, Digital Arts and New Media  
BFA, California Institute of the Arts. Former affiliations:  
Animation Mentor, Emeryville; University of California,  
Santa Cruz, Theater Arts Department.

### **Jorge Cortes (2004)**

Assistant Professor, Applied Mathematics and Statistics  
B.S., University of Basque Country (Spain); M.S.,  
University of Zaragoza (Spain); Ph.D., University Carlos  
III de Madrid (Spain).

### **Dan Costa, College Eight (1982)**

Professor, Ecology and Evolutionary Biology  
B.A., University of California, Los Angeles; Ph.D.,  
University of California, Santa Cruz; Ida Benson Lynn  
Professor, Ocean Health. Former affiliation: Scripps  
Institution of Oceanography.

### **William D. Coulter, Porter College (1995)**

Lecturer, Music (Classical Guitar)  
B.A., M.A., University of California, Santa Cruz; M.A., San  
Francisco Conservatory of Music.

### **Michael H. Cowan, Oakes College (1969)**

Professor, American Studies  
B.A., Ph.D., Yale University. Former affiliation: Yale  
University.

## Teaching and Administrative Staff

### **Donald Coyne, Porter College (1985)**

Adjunct Professor, Physics  
B.S., University of Kansas; Ph.D., California Institute of Technology.

### **David W. Crane, Porter College (1999)**

Assistant Professor, Film and Digital Media  
B.A., University of Wisconsin-Madison; M.A., Ph.D., University of Wisconsin-Milwaukee.

### **Sheila R. Crane (2000)**

Assistant Professor, History of Art and Visual Culture  
B.A., Smith College; M.A., Ph.D., Northwestern University.

### **Philip O. Crews, Cowell College (1970)**

Research Professor Emeritus, Chemistry  
B.S., University of California, Los Angeles; Ph.D., Princeton University. Former affiliation: University of California, Santa Barbara.

### **Edith G. Crichton, Porter College (1994)**

Professor, Art  
B.F.A., San Francisco State University; M.F.A., California College of Arts and Crafts. Former affiliation: California State University, Hayward.

### **Donald A. Croll (2000)**

Professor, Ecology and Evolutionary Biology  
B.Sc., University of California, Davis; M.Sc., California State University, Hayward (Moss Landing Marine Laboratories); Ph.D., Scripps Institution of Oceanography, University of California, San Diego.

### **Faye J. Crosby, Porter College (1997)**

Professor, Psychology  
A.B., Wheaton College; Ph.D., Boston University; LL.D. (Hon.), Ball State University. Former affiliations: Boston University; London School of Economics and Political Science; Yale University; Smith College.

### **Ben D. Crow, College Eight (1996)**

Professor, Sociology  
B.Sc., University of Westminster (Polytechnic of Central London); Ph.D., University of Edinburgh. Former affiliations: Stanford University; University of California, Berkeley.

### **Cynthia Cruz (2008)**

Assistant Professor  
B.A., Scripps College; Ph.D., University of California, Los Angeles. Former affiliations: Cornell University (2006-

2008); Pacific Oakes College (2001-2006); UCLA Teaching Fellow (2004).

### **Renwick E. Curry (2008)**

Adjunct Professor, Computer Engineering  
A.B., Middlebury College; S.B., S.M., E.A.A., and Ph.D., Massachusetts Institute of Technology.

### **Robert R. Curry, College Eight (1979)**

Professor Emeritus, Environmental Geology (Environmental Studies)  
B.A., M.Sc., University of Colorado; Ph.D., University of California, Berkeley. Former affiliations: University of California, Santa Barbara; University of Montana.

### **David L. Cuthbert, Porter College (2003)**

Professor, Theater Arts  
B.A., California State University, Fresno; M.F.A., University of California, San Diego. Former affiliations: Old Globe Theater (San Diego); PCPA Theaterfest; Vortex Lighting (Los Angeles); Sledgehammer Theatre.

### **John D. Daehnke (2013)**

Assistant Professor, Anthropology  
Ph.D., University of California, Berkeley; M.A., Portland State University; M.A., University of Wisconsin, Madison; B.A., University of Nebraska. University of California, Santa Cruz.

### **Audun Dahl (2014)**

Assistant Professor, Psychology  
B.Hum., Norwegian University of Science and Technology; M.Phil., University of Oslo; Ph.D., University of California, Berkeley.

### **Michael S. Dalbey (1977)**

Lecturer, Biology  
B.A., San Fernando Valley State College; Ph.D., University of California, Santa Cruz.

### **Charles W. Daniel, Cowell College (1965)**

Professor Emeritus, Molecular, Cell, and Developmental Biology  
B.A., University of New Mexico; M.S., University of Hawaii; Ph.D., University of California, Berkeley.

### **Sharon A. Daniel, Porter College (1996)**

Professor, Film and Digital Media  
B.M., Baylor University; M.M., University of Texas; M.F.A., University of Tennessee. Former affiliations: Massachusetts Institute of Technology; Maryland Institute College of Art; Rhode Island School of Design.

## Teaching and Administrative Staff

### **Peter B. Danzig (2010)**

Adjunct Professor, Computer Engineering  
B.S., University of California, Davis; Ph.D., University of California, Berkeley.

### **Samit Dasgupta (2008)**

Associate Professor  
Degrees: A.B., Harvard University; Ph.D., University of California, Berkeley.. Former affiliation: Harvard University..

### **Nicolas Davidenko (2012)**

Assistant Professor, Psychology  
A.B., Harvard University; M.S., Ph.D, Stanford University.  
Former affiliations: Stanford University; Harvard University.

### **Angela Y. Davis, Oakes College (1991)**

Professor, History of Consciousness  
B.A., Brandeis University; M.A., University of California, San Diego; Certificat de la Litterature Francaise Contemporaine, Sorbonne. Former affiliation: San Francisco State University.

### **James E. Davis (2004)**

Associate Professor, Computer Science  
B.S., University of California, Davis; Ph.D., Stanford University. Former affiliation: Honda Research Institute.

### **Amy Rose Deal (2011)**

Assistant Professor, Linguistics  
B.A., Brandeis University; Ph.D., University of Massachusetts Amherst. Former affiliation: Harvard University.

### **Luca De Alfaro (2001)**

Professor, Computer Engineering  
B.S., Ph.D., Politecnico di Torino (Italy); M.S., Ph.D., Stanford University. Former affiliation: University of California, Berkeley.

### **David W. Deamer (1994)**

Professor Emeritus (recalled), Chemistry and Biochemistry  
B.S., Duke University; Ph.D., Ohio State University School of Medicine. Former affiliation: University of California, Davis.

### **Carolyn Dean, Porter College (1991)**

Professor, History of Art and Visual Culture  
B.A., University of Puget Sound; M.A., C.Phil., Ph.D., University of California, Los Angeles. Former affiliation:

Texas Tech University.

### **Margaret L. Delaney, Crown College (1983)**

Professor, Ocean Sciences  
B.S., Yale University; Ph.D., Massachusetts Institute of Technology.

### **Teresa De Lauretis, Oakes College (1985)**

Professor Emerita, History of Consciousness  
Maturita Classica, Liceo-Ginnasio Dante Alighieri (Ravenna); Laurea, Universita Luigi Bocconi (Milan).  
Former affiliations: University of Wisconsin-Milwaukee; University of California, San Diego.

### **Grace P. Delgado (2013)**

Assistant Professor, History  
University of California, Los Angeles. Former affiliation: Pennsylvania State University.

### **Guillermo Delgado-P, Merrill College (1989)**

Lecturer, Latin American and Latino Studies  
B.A., Licenciatura, Catholic University of Chile (Santiago); Ph.D., University of Texas at Austin. Former affiliation: Gustavus Adolphus College.

### **Gina Dent, Kresge College (2002)**

Associate Professor, Feminist Studies, History of Consciousness, and Legal Studies  
B.A., University of California, Berkeley; M.A., M.Phil., Ph.D., Columbia University. Former affiliations: Columbia University; Princeton University.

### **Marc A. Desjardins**

Lecturer in Science Writing  
B.A., University of Vermont.

### **Joshua Deutsch, Merrill College (1986)**

Professor, Physics  
B.S., M.Sc., University of California, San Diego; Ph.D., Cambridge University. Former affiliation: University of California, Santa Barbara.

### **Nathaniel P. Deutsch (2008)**

Professor, History  
B.A., M.A., Ph.D., University of Chicago.. Former affiliations: Swarthmore College; City University of New York-Hunter College..

### **Martin J. Devecka (2014)**

Assistant Professor, Literature  
B.A., University of Chicago; Ph.D., Yale University.  
Former affiliations: Brown University, Yale University.

## Teaching and Administrative Staff

### **Rachel J. Dewey (1999)**

Senior Lecturer, Astronomy and Astrophysics  
A.B., Harvard University; Ph.D., Princeton University.  
Former affiliation: Princeton University.

### **Maria E. Diaz (1991)**

Associate Professor, History  
B.A., Syracuse University; M.A., University of Chicago;  
Ph.D., University of Texas at Austin.. Former affiliation:  
University of Texas at Austin..

### **May N. Diaz, Merrill College (1974)**

Professor Emerita, Anthropology  
B.A., Ph.D., University of California, Berkeley. Former  
affiliation: University of California, Berkeley.

### **Andrea Di Blas (2009)**

Assistant Adjunct Professor  
Ph.D. and M.S., Politecnico di Torino, Italy.

### **Michael Dine, Stevenson College (1990)**

Professor, Physics  
B.S., Johns Hopkins University; Ph.D., Yale University.  
Former affiliations: City College of the City University of  
New York; Stanford Linear Accelerator Center.

### **Janette Dinishak (2014)**

Assistant Professor, Philosophy  
B.A., University of California, Los Angeles; Ph.D.,  
University of Toronto.

### **John Dizikes, Cowell College (1965)**

Professor Emeritus, American Studies  
B.A., University of California, Los Angeles; Ph.D.,  
Harvard University. Former affiliation: University of  
Connecticut.

### **Daniel F. Doak, College Eight (1992)**

Professor, Ecology and Evolutionary Biology  
B.A., Swarthmore College; Ph.D., University of  
Washington. Former affiliations: San Francisco State  
University; University of Washington.

### **Carlos E. Dobkin (2003)**

Associate Professor, Economics  
B.A., University of California, Santa Cruz; M.A., Ph.D.,  
University of California, Berkeley.

### **Andrew E. Doe, Porter College (1973)**

Professor Emeritus, Theater Arts (Drama)  
B.S., University of Vermont; M.A., University of  
Washington. Former affiliations: Lower Columbia  
College; University of Iowa; University of Michigan;

University of Southern California; Pomona College.

### **George W. Domhoff, Stevenson College (1965)**

Professor Emeritus, Psychology  
B.A., Duke University; M.A., Kent State University; Ph.D.,  
University of Miami. Former affiliation: California State  
College, Los Angeles.

### **Bryan A. Donaldson (2013)**

Assistant Professor, Language Program  
B.A., University of Minnesota; M.A., Ph.D., Indiana  
University. Former affiliation: University of Texas at  
Austin.

### **Chongying Dong, Crown College (1990)**

Professor, Mathematics  
B.S., Xian Telecommunication and Engineering  
University; Ph.D., Institute of System Science, Academia  
Sinica. Former affiliation: Rutgers University.

### **Michael P. Dooley (1992)**

Professor, Economics  
B.S., Duquesne University; M.A., University of Delaware;  
Ph.D., Pennsylvania State University.. Former  
affiliations: International Monetary Fund; Federal  
Reserve Bank..

### **David E. Dorfan, Oakes College (1968)**

Professor Emeritus, Physics  
B.Sc., University of Cape Town; Ph.D., Columbia  
University. Former affiliations: Columbia University;  
Stanford Linear Accelerator Center.

### **Farid U. Dowla (2008)**

Adjunct Professor, Electrical Engineering  
B.S., MS., Ph.D., Massachusetts Institute of Technology.  
Former affiliations: Lawrence Livermore National  
Laboratory; University of California, Berkeley;  
University of California, Davis; Massachusetts Institute  
of Technology..

### **Margaret M. Downes-Baskin (1998)**

Research Associate, Feminist Studies  
B.A., Vassar College; M.A., California State University,  
Northridge; Ph.D., Claremont Graduate School of  
Government.

### **William T. Doyle, Crown College (1965)**

Professor Emeritus, Ecology and Evolutionary Biology  
B.A., Ph.D., University of California, Berkeley. Former  
affiliation: Northwestern University.

### **Frank D. Drake (1984)**

## Teaching and Administrative Staff

Professor Emeritus, Astronomy and Astrophysics  
B. Eng. Physics, Cornell University; M.A., Ph.D., Harvard University. Concurrent affiliation: SETI Institute.  
Former affiliations: Harvard University; National Radio Astronomy Observatory; Jet Propulsion Laboratory; Cornell University.

### **David Draper (2001)**

Professor, Applied Mathematics and Statistics  
B.Sc., University of North Carolina at Chapel Hill; M.A., Ph.D., University of California, Berkeley. Former affiliations: University of Chicago; RAND Corporation; University of California, Los Angeles; University of Bath (England).

### **Timothy Duane (2009)**

Associate Professor, Environmental Studies  
J.D., Boalt Hall School of Law, University of California, Berkeley; Ph.D.; M.S., civil engineering, Stanford University; A.B.; Human Biology: Planning and Policy, Stanford University. University of California, Berkeley; Vermont Law School.

### **Rebecca M. Dubois (2013)**

Assistant Professor, Biomolecular Engineering  
B.A., University of Colorado, Boulder; M.S., Ph.D., University of California, San Diego. Former affiliations: St. Jude Children's Research Hospital, Pasteur Institute.

### **Walter S. Dudley, Porter College (1968)**

Professor Emeritus, Music  
B.M., B.A., North Texas State University; M.A., Ph.D., University of California, Berkeley. Former affiliation: University of California Education Abroad Program (Grenoble, Montpellier, Marseilles).

### **William B. Dunbar (2004)**

Associate Professor, Computer Engineering  
B.S., Virginia Polytechnic Institute and State University; M.S., University of California, San Diego; Ph.D., California Institute of Technology.

### **E M. Du Puis, Crown College (1997)**

Professor, Sociology  
B.A., Radcliffe College, Harvard University; M.S., Ph.D., Cornell University. Former affiliations: State University of New York at Albany; New York State Department of Economic Development; Skidmore College; Rensselaer Polytechnic Institute; Siena College; Hudson Valley Community College.

### **Robert M. Durling, Cowell College (1966)**

Professor Emeritus, Italian and English Literature

B.A., M.A., Ph.D., Harvard University. Former affiliations: Haverford College; Cornell University.

### **Mark R. Eastman (1990)**

Lecturer, Mathematics  
B.A., Colorado College; M.A., University of Montana, Missoula; Ph.D., University of California, Santa Cruz.

### **Kent H. Eaton, Merrill College (2006)**

Professor, Politics  
B.A., Stanford University; Ph.D., Yale University. Princeton University; Naval Postgraduate School.

### **Robert S. Edgar, Crown College (1970)**

Professor Emeritus, Molecular, Cell, and Developmental Biology  
B.Sc., McGill University; Ph.D., University of Rochester. Former affiliation: California Institute of Technology.

### **Kate Edmunds, Porter College (2004)**

Professor, Theater Arts  
B.F.A., Wayne State University; M.F.A., Yale School of Drama. Former affiliation: University of California, Berkeley.

### **Christopher A. Edwards (2002)**

Professor, Ocean Sciences  
B.A. (Hons.), Haverford College; Ph.D., Massachusetts Institute of Technology and Woods Hole Oceanographic Institution. Former affiliation: University of Connecticut.

### **Michael D. Edwards**

Adjunct Professor, Theater Arts  
B.A., Monash University, Australia; M.F.A., University of California, Los Angeles. Concurrent Affiliation: Asolo Theater, Sarasota, Florida.. Former affiliation: Sate College of Victoria, Australia..

### **Torsten Ehrhardt (2004)**

Professor, Mathematics  
Dipl. Math., Dr. rer. nat., Dr. habil., Chemnitz University of Technology (Germany). Former affiliation: Chemnitz University of Technology.

### **Olof Einarsdottir, Crown College (1989)**

Professor, Chemistry and Biochemistry  
B.A., University of Iceland, Reykjavik; Ph.D., Colorado State University, Fort Collins. Former affiliation: Los Alamos National Laboratory.

### **Magdalini Eirinaki (2006)**

Lecturer

## Teaching and Administrative Staff

B.S., University of Piraeus, Greece; M.S., University of London, UK; Ph.D., Athens University of Economics and Business, Greece.. Athens University of Economics and Business.

### **Bernard L. Elbaum, Merrill College (1986)**

Associate Professor, Economics  
B.A., University of Michigan; Ph.D., Harvard University.

### **Gabriel H. Elkaim, Crown College (2003)**

Professor, Computer Engineering  
B.S., Princeton University; M.S., Ph.D., Stanford University. Concurrent Affiliation: Concurrent affiliation: Delta Technology Associates.

### **John M. Ellis, Crown College (1966)**

Professor Emeritus, German Literature  
B.A., Ph.D., University of London. Former affiliations: University of Wales; University of Leicester; University of Alberta.

### **Jonathan E. Ellis, Cowell College (2002)**

Associate Professor, Philosophy  
B.A., Dartmouth College; Ph.D., University of California, Berkeley.

### **Peter Q. Elsea, Porter College (1980)**

Lecturer, Music  
B.M., M.A., University of Iowa. Former affiliation: University of Iowa.

### **Angela A. Elsey, Cowell College (1988)**

Lecturer, French Language  
B.A., Kalamazoo College; M.A.T., University of Michigan. Former affiliations: San Francisco State University; Oregon State University; Hope College.

### **Harland W. Epps, Porter College (1989)**

Professor, Astronomy and Astrophysics; Astronomer, UC Observatories/Lick Observatory  
B.A., Pomona College; M.S., Ph.D., University of Wisconsin. Former affiliation: University of California, Los Angeles.

### **Barbara L. Epstein, Oakes College (1973)**

Professor Emerita, History of Consciousness  
B.A., Radcliffe College; M.A., Ph.D., University of California, Berkeley.

### **Shelly E. Errington, Kresge College (1972)**

Professor, Anthropology  
B.A., Newcomb College, Tulane University; M.A., Ph.D., Cornell University. Former affiliation: Institute for

Advanced Study (Princeton).

### **Heinz Erzberger (2006)**

Adjunct Professor, Electrical Engineering  
B.S., California Polytechnic State University; M.E.E., Ph.D., Cornell University.. Former affiliations: NASA Ames Research Center..

### **James A. Estes (1978)**

Adjunct Professor, Ecology and Evolutionary Biology and Ocean Sciences  
B.A., University of Minnesota; M.S., Washington State University; Ph.D., University of Arizona.

### **J P. Euben, Kresge College (1967)**

Professor Emeritus, Politics  
B.A., Swarthmore College; M.A., Ph.D., University of California, Berkeley; Certificate, Oxford University.

### **Maria Evangelatou (2007)**

Associate Professor, History of Art and Visual Culture  
B.A., University of Ioannina, Greece; M.A., Ph.D., Courtauld Institute of Art, London. Former affiliations: Radcliffe Institute for Advance Studies, Harvard University: postdoctoral research fellowship.

### **Maria V. Ezerova, Porter College (1994)**

Lecturer, Music (Piano)  
B.M., Musical College, Moscow State University; M.A., University of California, Santa Cruz; M.M., D.M.A. equivalents, Moscow State Conservatory. Former affiliations: Russian Academy of Musical Arts (Moscow); Moscow State Conservatory; Turkmenian State Institute of Musical Arts (Ashkhabad).

### **S M. Faber, Crown College**

Professor Emeritus, Astronomy and Astrophysics  
B.A., Swarthmore College; Ph.D., Harvard University.

### **Robert W. Fairlie, College Ten (1994)**

Professor, Economics  
B.A., Stanford University; M.A., Ph.D., Northwestern University.

### **Sylvanna M. Falcon (2010)**

Assistant Professor of Latin American and Latino Studies  
B.A., Santa Clara University; M.A., University of New Mexico, Albuquerque; Ph.D., University of California, Santa Barbara.. Former affiliation: University of California, Riverside, University of California, Office of the President; Connecticut College; University of California, Santa Barbara..

## Teaching and Administrative Staff

### **Donka F. Farkas, Stevenson College (1991)**

Professor, Linguistics  
B.A., University of Bucharest (Romania); Ph.D.,  
University of Chicago. Former affiliation: Yale  
University.

### **Bryan H. Farrell, College Eight (1974)**

Professor Emeritus, Geography (Environmental  
Studies)  
B.A., University of Canterbury (New Zealand); M.A.,  
University of Washington; Ph.D., University of  
Auckland. Former affiliations: Southern Methodist  
University; University of Auckland; University of  
Alberta; University of Victoria (Canada).

### **Farnaz Fatemi**

Lecturer  
B.A., University of California, Santa Cruz; M.F.A., Mills  
College. University of California, Los Angeles.

### **John Faulkner, Crown College (1969)**

Professor Emeritus, Astronomy and Astrophysics  
B.A., M.A., Ph.D., St. John's College, Cambridge  
University. Former affiliations: Cambridge University;  
California Institute of Technology; Institute of  
Theoretical Astronomy (Cambridge).

### **B K. Faunce (2002)**

Lecturer, Writing  
B.A., M.A., University of Pacific, Stockton; Ph.D.,  
University of California, Riverside.

### **Lars Fehren-Schmitz (2013)**

Assistant Professor, Anthropology  
Ph.D., M.A., B.A., University of Goettingen, and Humboldt  
University, Berlin. Former affiliation: University of  
Goettingen.

### **David A. Feldheim (2002)**

Assistant Professor, Molecular, Cell, and Developmental  
Biology  
B.A., University of California, San Diego; Ph.D.,  
University of California, Berkeley.

### **Jerry F. Feldman, Crown College**

Professor Emeritus, Molecular, Cell, and Developmental  
Biology  
B.A., Swarthmore College; M.A., Ph.D., Princeton  
University. Former affiliations: California Institute of  
Technology; State University of New York at Albany.

### **Veronica E. Feliu, Merrill College (1999)**

Lecturer, Spanish Language  
Licenciante, Universidad de Chile; Ph.D., Duke University.  
Former affiliation: Duke University.

### **F J. Ferguson, College Eight (1987)**

Professor, Computer Engineering; Provost, Crown  
College  
B.S.E., University of North Carolina at Charlotte;  
M.S.E.E./C.E., Ph.D., Carnegie Mellon University.

### **Mayanthi L. Fernando (2008)**

Associate Professor of Anthropology  
M.A., Harvard University; Ph.D., University of Chicago..  
Former affiliation: Washington University, St. Louis.

### **Anthony L. Fink, Crown College (1969)**

Professor, Chemistry and Biochemistry  
B.Sc., Ph.D., Queen's University (Canada). Former  
affiliation: Queen's University.

### **Noah J. Finnegan (2009)**

Assistant Professor, Earth and Planetary Sciences  
B.A., Carleton College; Ph.D., University of Washington.  
Former affiliations: Cornell University, University of  
California, Berkeley National Center for Earth-Surface  
Dynamics.

### **Arthur E. Fischer, Crown College (1972)**

Professor Emeritus, Mathematics  
B.A., Columbia University; Ph.D., Princeton University;  
M.D., Albert Einstein College of Medicine. Former  
affiliation: University of California, Berkeley.

### **Andrew T. Fisher, College Eight (1995)**

Professor, Earth and Planetary Sciences  
B.S., Stanford University; Ph.D., University of Miami.  
Former affiliations: Indiana Geological Survey; Indiana  
University; Texas A&M University; Ocean Drilling  
Program.

### **William L. Fitch (2012)**

Adjunct Professor, Chemistry and Biochemistry  
Ph.D., Stanford University; M.S., University of Michigan.  
Former affiliations: Roche Pharmaceuticals; Sandoz  
Crop Protection; Affymax, Inc..

### **Tim R. Fitzmaurice, Crown College (1982)**

Lecturer Emeritus, Writing  
B.A., San Jose State University; M.A., University of  
California, Santa Cruz.

### **Margaret I. Fitzsimmons, College Eight (1994)**

Professor, Environmental Studies

## Teaching and Administrative Staff

B.A., Stanford University; M.A., California State University, Northridge; Ph.D., University of California, Los Angeles. Former affiliation: Graduate School of Architecture and Urban Planning, University of California, Los Angeles.

### **Cormac A. Flanagan (2003)**

Professor, Computer Science  
B.S., University College Dublin; M.S., Ph.D., Rice University. Former affiliations: Systems Research Center; DEC; Compaq; Hewlett-Packard.

### **Stanley M. Flatte, Crown College (1971)**

Professor Emeritus, Physics  
B.S., California Institute of Technology; Ph.D., University of California, Berkeley. Former affiliation: Lawrence Radiation Laboratory, Berkeley.

### **A R. Flegal, Crown College (1985)**

Professor, Microbiology and Environmental Toxicology  
B.A., University of California, Santa Barbara; M.A., Moss Landing Marine Laboratories; Ph.D., Oregon State University. Former affiliation: California Institute of Technology.

### **Mary K. Foley, Porter College (1980)**

Professor, Theater Arts (Drama)  
B.A., Rosemont College; M.A., University of Massachusetts; Ph.D., University of Hawaii at Manoa. Former affiliation: University of Massachusetts.

### **Samantha E. Forde (2009)**

Adjunct Professor, Ecology and Evolutionary Biology;  
Gordon and Betty Moore Foundation  
B.A., University of California, Santa Barbara; Ph.D., University of California, Santa Cruz. Researcher, Ecology and Evolutionary Biology, University of California, Santa Cruz.

### **Doyle Foreman, Porter College (1968)**

Professor Emeritus, Art  
B.F.A., California College of Arts and Crafts.

### **Camilla E. Forsberg (2007)**

Associate Professor, Biomolecular Engineering  
Ph.D., University of Wisconsin, Madison. Former affiliation: University of Wisconsin.

### **Jonathan J. Fortney (2007)**

Associate Professor, Astronomy and Astrophysics  
B.S., Iowa State University; Ph.D., University of Arizona. NASA Ames Research Center.

### **Jonathan A. Fox, Merrill College (1995)**

Professor, Latin American and Latino Studies  
B.A., Princeton University; Ph.D., Massachusetts Institute of Technology. Former affiliation: Massachusetts Institute of Technology.

### **Laurel R. Fox, Crown College (1977)**

Professor, Ecology and Evolutionary Biology  
B.S., Cornell University; M.A., Ph.D., University of California, Santa Barbara. Former affiliation: Australian National University.

### **Jean E. Fox Tree, Porter College (1994)**

Professor, Psycholinguistics (Psychology)  
A.B., Harvard University; M.Sc., University of Edinburgh; Ph.D., Stanford University. Former affiliations: Stanford University; Max Planck Institute for Psycholinguistics (Nijmegen, Netherlands).

### **Dana L. Frank, Merrill College (1991)**

Professor, History  
B.A., University of California, Santa Cruz; M.A., Ph.D., Yale University. Former affiliation: University of Missouri at St. Louis.

### **Mark Franko, Porter College (1991)**

Professor Emeritus, Theater Arts (Dance)  
B.A., City College of New York; Ph.D., Columbia University. Former affiliations: Columbia University; Université Paul Valéry; Princeton University; Purdue University.

### **Carla A. Freccero, Kresge College (1991)**

Professor and Chair of Literature and of History of Consciousness, and Feminist Studies  
B.A., Harvard University; M.Phil., Ph.D., Yale University. Former affiliation: Dartmouth College.

### **Carol M. Freeman, Cowell College (1974)**

Senior Lecturer, Writing  
B.A., Carleton College; Ph.D., Yale University. Former affiliation: Yale University.

### **Maria C. Freeman, Crown College (1990)**

Lecturer, Writing  
B.A., University of Maryland; M.S., Georgetown University. Former affiliation: University of California, Berkeley.

### **Rosa-Linda Fregoso, Merrill College (2001)**

Professor, Latin American and Latino Studies  
B.J., University of Texas at Austin; Ph.D., University of California, San Diego. Former affiliations: University of

## Teaching and Administrative Staff

California, Davis; University of California, Los Angeles; University of California, Santa Barbara.

### **William H. Friedland (1969)**

Professor Emeritus, Community Studies and Sociology  
B.A., M.A., Wayne State University; Ph.D., University of California, Berkeley. Former affiliation: Cornell University.

### **Benjamin Friedlander (1999)**

Professor, Electrical Engineering  
B.S., M.S., Technion University (Israel); M.S., Ph.D., Stanford University. Former affiliation: University of California, Davis.

### **Daniel Friedman, Crown College (1985)**

Professor, Economics  
B.A., Reed College; M.A., Ph.D., University of California, Santa Cruz. Former affiliations: University of California, Los Angeles; University of California, Berkeley.

### **Susan Friedman, Porter College (1981)**

Lecturer, Art  
B.A., University of Buffalo; M.F.A., San Francisco Art Institute. Former affiliation: Cabrillo College.

### **Gregory J. Fritsch, Porter College (1987)**

Lecturer, Theater Arts  
B.Ed., M.A., University of Miami.

### **Donald C. Fritz (1988)**

Lecturer, Art  
B.A., University of California, Santa Cruz; M.F.A., University of California, Davis.

### **Paul Frymer, College Ten (2004)**

Associate Professor, Politics  
B.A., University of California, Berkeley; M.A., Ph.D., Yale University; J.D., University of California, Berkeley.  
Former affiliation: University of California, San Diego.

### **Sakae Fujita (1991)**

Lecturer, Japanese Language  
B.A., Osaka University of Education; M.A., Monterey Institute of International Studies; Ph.D. cand., University of California, Berkeley. Former affiliation: Monterey Institute of International Studies.

### **Hiroshi Fukurai, Stevenson College (1990)**

Professor, Sociology  
B.A., California State University, Fullerton; M.A., Ph.D., University of California, Riverside. Former affiliations: University of California, Riverside; Texas A&M

University.

### **Kwok-Chiu Fung, Crown College (1989)**

Professor, Economics  
B.A., Swarthmore College; M.S., Ph.D., University of Wisconsin-Madison. Former affiliations: Mount Holyoke College; Stanford University.

### **Pascale Gaitet, Kresge College (1986)**

Professor Emerita, Literature and Language Studies  
B.A., M.A., Oxford University; Ph.D., Princeton University.

### **Patricia M. Gallagher, Porter College (2004)**

Professor, Theater Arts  
B.A., University of Arizona; M.A., Ph.D., University of Wisconsin-Madison.

### **Alison Galloway, Crown College (1990)**

Professor, Anthropology; Chair, Academic Senate  
B.A., University of California, Berkeley; M.A., Ph.D., University of Arizona. Former affiliation: University of Tennessee.

### **Frank R. Galuszka, Porter College (1995)**

Professor Emeritus, Art  
B.F.A., M.F.A., Temple University, Tyler School of Art.  
Former affiliation: University of the Arts, College of Art and Design (Philadelphia).

### **Mary-Kay Gamel, Cowell College (1973)**

Professor, Classics and Comparative Literature  
B.A., Smith College; M.A., Harvard University; Ph.D., University of California, Berkeley. Former affiliation: Boston University.

### **Pascale Garaud (2004)**

Professor, Applied Mathematics and Statistics  
B.S., Université Louis Pasteur; M.S., Ph.D., Cambridge University. Former affiliation: Cambridge University.

### **Jose J. Garcia-Luna-Aceves, Crown College (1993)**

Prof., Computer Eng.; Baskin Endowed Prof. of Computer Engineering; Dir., Networking Sciences Inst.  
B.S., Universidad Iberoamericana (Mexico City); M.S., Ph.D., University of Hawaii. Former affiliation: Stanford Research Institute International.

### **Ian Garrick-Bethell (2010)**

Assistant Professor, Earth and Planetary Sciences  
B.A., Wesleyan University; M.S., Ph.D., Massachusetts Institute of Technology. Massachusetts Institute of Technology.

## Teaching and Administrative Staff

### **Robert E. Garrison, Stevenson College (1968)**

Professor Emeritus, Earth and Planetary Sciences  
B.S., M.S., Stanford University; Ph.D., Princeton  
University. Former affiliations: University of California,  
Santa Barbara; University of British Columbia.

### **John C. Garza (2003)**

Associate Adjunct Professor, Ocean Sciences  
Ph.D., University of California, Berkeley.

### **George D. Gaspari, Porter College (1967)**

Professor Emeritus, Physics  
B.S., DePaul University; Ph.D., University of California,  
Riverside. Former affiliation: University of Rochester.

### **Christiane Gautier (2007)**

Lecturer, French Language  
M.B., Université de Lettres et Langues, Poitiers  
(France); M.A., Iowa State University; Ed.D., University  
of San Francisco. Former affiliations: Sonoma State  
University; San Francisco State University; University of  
Iowa.

### **Carole C. George (1989)**

Physical Education Instructor  
B.A., University of California, Santa Cruz.

### **Ingeborg L. Gerdes, Porter College (1981)**

Lecturer, Art  
University of Heidelberg, Germany; M.F.A., San  
Francisco Art Institute.

### **Lise Getoor (2013)**

Professor, Computer Science  
B.S., University of California, Santa Barbara; M.S.,  
University of California, Berkeley; Ph.D., Stanford  
University. Former affiliation: University of Maryland.

### **Raymond W. Gibbs, Cowell College (1982)**

Professor, Psychology  
B.A., Hampshire College; M.A., Ph.D., University of  
California, San Diego. Former affiliations: Yale  
University; Stanford University.

### **Margaret A. Gibson, Merrill College (1990)**

Professor Emerita, Education  
B.A., Wheaton College; M.Ed., Ph.D., University of  
Pittsburgh. Former affiliation: California State  
University, Sacramento.

### **Diane Gifford-Gonzalez, Merrill College (1976)**

Professor, Anthropology

B.A., M.A., Ph.D., University of California, Berkeley.  
Former affiliation: University of Nevada.

### **Ricard Gil, College Ten (2004)**

Assistant Professor, Economics  
B.A., Universitat Pompeu Fabra, Spain; M.A., Ph.D. cand.,  
University of Chicago. Former affiliations: University of  
Chicago; Universitat Pompeu Fabra, Spain.

### **Gregory S. Gilbert, College Eight (2000)**

Professor, Environmental Studies  
B.S., State University of New York, College of  
Environmental Science and Forestry; M.S., Ph.D.,  
University of Wisconsin-Madison.

### **James B. Gill, Oakes College (1972)**

Professor Emeritus, Earth and Planetary Sciences  
B.S., Wheaton College; M.S., Franklin and Marshall  
College; Ph.D., Australian National University.

### **Susan Gillman, Oakes College (1986)**

Professor, American Literature  
A.B., Bryn Mawr College; Ph.D., University of California,  
Berkeley. Former affiliation: Rice University.

### **Viktor Ginzburg, College Eight (1996)**

Professor, Mathematics  
M.S., Moscow Institute of Steel and Alloys; Ph.D.,  
University of California, Berkeley. Former affiliations:  
University of California, Berkeley; Princeton University;  
Stanford University.

### **Per F. Gjerde, College Nine (1989)**

Professor Emeritus, Psychology  
Cand. Psychol., University of Bergen (Norway); Ph.D.,  
University of California, Berkeley. Former affiliation:  
University of California, Berkeley.

### **Ronald Glass, College Ten (2005)**

Professor  
A.B., Ed.M., Harvard University; C. Phil., UC Berkeley;  
M.A., Ph.D., Stanford University. Former affiliations:  
Arizona State University; UC Berkeley; Stanford  
University.

### **Gary A. Glatzmaier (1998)**

Professor, Earth and Planetary Sciences  
B.S., Marquette University; Ph.D., University of  
Colorado. Former affiliation: Los Alamos National  
Laboratory.

### **Shannon M. Gleeson (2008)**

Associate Professor, Latin American and Latino Studies

## Teaching and Administrative Staff

B.S., Santa Clara University; M.A., Ph.D., University of California, Berkeley.

### **Stephen R. Gliessman, College Eight (1980)**

Alfred E. Heller Professor, Agroecology (Environmental Studies)  
B.A., M.A., Ph.D., University of California, Santa Barbara.  
Former affiliation: Colegio Superior de Agricultura Tropical (Mexico).

### **Wlad B. Godzich, Cowell College (2000)**

Professor, Literature  
M.A., Ph.D., Columbia University. Former affiliations:  
Universite de Genève; University of Toronto; University of Montreal; University of Minnesota; Yale University; Columbia University.

### **Lynda J. Goff, Crown College (1975)**

Professor Emeritus, Ecology and Evolutionary Biology;  
Vice Provost and Dean, Undergraduate Education  
B.Sc., Western Oregon State College; Ph.D., University of British Columbia. Former affiliations: University of Washington, Friday Harbor Marine Station; University of British Columbia; U.S. Forest Service.

### **Robert A. Goff, Cowell College (1968)**

Associate Professor Emeritus, Philosophy  
B.A., Colgate University; Ph.D., Drew University. Former affiliations: Moravian College; Hamilton College.

### **Walter L. Goldfrank, College Eight (1968)**

Professor Emeritus, Latin American and Latino Studies and Sociology  
B.A., Harvard College; Certificate in Sociology, University of Madrid; Ph.D., Columbia University.  
Former affiliation: Columbia University.

### **Camilo Gomez-Rivas (2014)**

Assistant Professor, Literature  
A.B., University of Georgia; M.A., M.Phil., Ph.D., Yale University. Former affiliation: American University, Cairo.

### **Qi Gong (2008)**

Associate Professor, Applied Mathematics and Statistics  
B.E., University of Science and Technology, China; M.E., Southeast University, China; Ph.D., Case Western Reserve University. Former affiliations: University of Texas at San Antonio; Naval Postgraduate School.

### **Jennifer A. Gonzalez, Porter College (1997)**

Professor, History of Art and Visual Culture  
B.A., Yale University; Ph.D., University of California,

Santa Cruz. Former affiliation: Rhode Island School of Design.

### **Julie H. Gonzalez (2004)**

Lecturer, Economics  
B.S., California Polytechnic State University; Ph.D., University of Southern California.

### **Maria Gonzalez Pagani (1992)**

Senior Lecturer, Spanish Language  
B.A., M.A., Universidad Nacional de Tucuman (Argentina). Former affiliations: Northwestern University; University of Michigan; University of Illinois, Chicago.

### **David Goodman, College Eight (1990)**

Professor Emeritus, Environmental Studies  
B.Sc., London School of Economics and Political Science; Ph.D., University of California, Berkeley. Former affiliations: University College London; University of Manchester.

### **June A. Gordon, College Nine (1996)**

Professor, Education  
B.A., Stanford University; M.A., Western Washington University; Ph.D., University of Washington. Former affiliation: University of Washington.

### **Susan Gorsky (2003)**

Lecturer, Writing  
A.B., Smith College, Massachusetts; M.A., Ph.D., Case Western Reserve University.

### **Deborah B. Gould (2009)**

Associate Professor, Sociology  
Ph.D., University of Chicago. University of Pittsburg.

### **Shelly A. Grabe (2010)**

Associate Professor, Psychology  
B.A., Michigan State University; Ph.D., University of Missouri-Columbia. University of Washington, University of Wisconsin-Madison.

### **Sarah E. Grace (2013)**

Lecturer, Writing Program  
M.S., University of California, Santa Cruz; M.A., University of Arizona, Tucson; Single Subject Teaching Credential, California State University, Sacramento; B.A., Humboldt State University, Arcata.

### **Shelby Graham (2013)**

Lecturer, Digital Arts and New Media  
B.F.A., M.F.A., San Jose State University; Certification,

## Teaching and Administrative Staff

Northwestern University, Chicago. University of California, Santa Cruz; San Jose State University; Cabrillo College; Seinan Gakuin University, Fukuoka, Japan; Hartnell College, Salinas.

### **Herman S. Gray, Stevenson College (1991)**

Professor, Sociology  
B.A., Florida A&M University; M.A., Washington State University; Ph.D., University of California, Santa Cruz.  
Former affiliation: Northeastern University.

### **Barry L. Green (1996)**

Lecturer, Music (String Bass)  
B.M., Indiana University; M.M., University of Cincinnati, Conservatory of Music. Former affiliations: University of Cincinnati; Indiana University.

### **Richard Edward E. Green (2010)**

Assistant Professor, Biomolecular Engineering  
B.S., University of Georgia, Athens; Ph.D, University of California, Berkeley. Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany; University of California, Berkeley.

### **Marvin J. Greenberg, Stevenson College (1967)**

Professor Emeritus, Mathematics  
B.A., Columbia University; Ph.D., Princeton University.  
Former affiliations: Rutgers University; University of California, Berkeley; Northeastern University.

### **Miriam B. Greenberg, College Ten (2006)**

Associate Professor, Sociology  
B.A., Eugene Lang College, The New School for Social Research; Ph.D., City University of New York.  
Department of Social Science and Cultural Studies, Pratt Institute, Brooklyn, New York.

### **Jody Greene, Kresge College (1998)**

Professor, Literature and Feminist Studies  
B.A., Yale University; M.A., Ph.D., Cornell University.  
Former affiliations: Cornell University; Hobart and William Smith Colleges.

### **Ronald E. Grieson, Crown College (1980)**

Professor Emeritus, Economics  
B.A., Queen's College; M.A., Ph.D., University of Rochester. Former affiliations: Massachusetts Institute of Technology; Columbia University; Princeton University.

### **Gary B. Griggs, College Eight (1968)**

Professor, Earth and Planetary Sciences; Director, Institute of Marine Sciences

B.A., University of California, Santa Barbara; Ph.D., Oregon State University. Former affiliation: Oregon State University.

### **Martin L. Griss (2002)**

Research Associate, Computer Science  
B.S., Technion, Haifa, Israel; M.S., Ph.D., University of Illinois. Concurrent Affiliation: Concurrent affiliations: Carnegie Mellon University, Silicon Valley Campus.

### **Kirsten S. Gruesz, Oakes College (1996)**

Professor, Literature  
B.A., Swarthmore College; Ph.D., Yale University.  
Former affiliation: College of William and Mary.

### **Isebill V. Gruhn, Stevenson College (1969)**

Professor Emerita, Politics  
B.A., Dickinson College; M.A., Johns Hopkins University; Ph.D., University of California, Berkeley. Former affiliation: Oberlin College.

### **Claire X. Gu (1997)**

Professor, Electrical Engineering  
B.S., Fudan University (China); Ph.D., California Institute of Technology. Former affiliations: Pennsylvania State University; Rockwell International Science Center.

### **WEISHI GU (2013)**

Acting Assistant Professor, Economics  
Ph.D., Cornell University. Former affiliation: Cornell University.

### **Daniel E. Guevara, Cowell College (1991)**

Associate Professor, Philosophy  
B.A., California State University, Los Angeles; C.Phil., Ph.D., University of California, Los Angeles.

### **Puragra Guha Thakurta (1994)**

Professor, Astronomy and Astrophysics; Astronomer, UC Observatories/Lick Observatory  
B.Sc., St. Xavier's College (Calcutta, India); M.A., Ph.D., Princeton University.

### **Irene Gustafson, Porter College (2003)**

Assistant Professor, Film and Digital Media  
B.A., Evergreen State College; M.F.A., Northwestern University. Former affiliation: School of the Art Institute of Chicago.

### **Matthew R. Guthaus, Crown College**

Associate Professor, Computer Engineering  
B.S.E., M.S.E., Ph.D., University of Michigan.

## Teaching and Administrative Staff

### **Julie H. Guthman, College Nine (2003)**

Professor, Social Sciences  
B.A., University of California, Santa Cruz; M.B.A., Ph.D.,  
University of California, Berkeley. Former affiliation:  
University of California, Berkeley.

### **Gey-Hong Gweon (2006)**

Assistant Professor  
Ph.D., University of Michigan, 1999.. University of  
California, Berkeley Lawrence Berkeley National  
Laboratory.

### **Melissa Gwyn, Porter College (2002)**

Associate Professor, Art  
B.A., Ohio State University; M.F.A., Yale University  
School of Art. Former affiliation: San Francisco Art  
Institute.

### **Lisbeth Haas, Merrill College (1986)**

Professor, History, Feminist Studies  
B.A., University of California, San Diego; Ph.D.,  
University of California, Irvine.

### **Howard E. Haber, Stevenson College (1982)**

Professor, Physics  
S.B., S.M., Massachusetts Institute of Technology; Ph.D.,  
University of Michigan.

### **Judith A. Habicht Mauche, Crown College (1990)**

Professor, Anthropology  
B.A., College of William and Mary; M.A., Ph.D., Harvard  
University. Former affiliation: School of American  
Research (Santa Fe).

### **Brent M. Haddad, College Eight (1997)**

Professor, Technology and Information Management  
B.A., Stanford University; M.A., Georgetown University;  
M.B.A., Ph.D., University of California, Berkeley. Former  
affiliation: Monterey Institute of International Studies.

### **Steven H. Haddock (2005)**

Adjunct Professor, Ocean Sciences  
Ph.D., University of California, Santa Barbara.

### **Gildas Hamel, Cowell College (1984)**

Lecturer Emeritus, French Language and Classical  
Studies  
B.A., Universite de Haute-Bretagne; Ph.D., University of  
California, Santa Cruz.

### **Roxanne P. Hamilton**

Lecturer, Writing  
B.A., University of Colorado; M.F.A., Cornell University.

### **Phillip L. Hammack, College Ten (2007)**

Assistant Professor, Psychology  
B.A., Georgetown University; M.A., Loyola University;  
Ph.D. cand., University of Chicago..

### **Nicol Hammond (2013)**

Assistant Professor, Music  
B.M., University of Witwaterstrand, Johannesburg,  
South Africa; M.A., Ph.D., New York University. Former  
affiliation: Montclair State University.

### **Craig W. Haney, Stevenson College (1977)**

Professor, Psychology  
B.A., University of Pennsylvania; M.A., Ph.D., J.D.,  
Stanford University. Former affiliation: Stanford  
University.

### **Jorge Hankamer, Stevenson College (1980)**

Professor, Linguistics  
B.A., M.A., Rice University; Ph.D., Yale University.  
Former affiliation: Harvard University.

### **Robert W. Hansen (1977)**

Physical Education Instructor  
B.S., M.A., San Jose State University.

### **Hardeman H. Hanson, Porter College**

Professor Emeritus, Art  
B.F.A., Yale University. Former affiliations: San  
Fernando Valley State College; University of Southern  
California.

### **Donna J. Haraway, Oakes College (1980)**

Professor Emerita, History of Consciousness and  
Feminist Studies  
B.A., Colorado College; M.Phil., Ph.D., Yale University.  
Former affiliations: University of Hawaii; Johns Hopkins  
University.

### **Daniel K. Harder (2004)**

Associate Adjunct Professor, Ecology and Evolutionary  
Biology; Executive Director, UCSC Arboretum  
B.S., University of Wisconsin-Madison; Ph.D., University  
of California, Berkeley.

### **Susan F. Harding, Porter College (1989)**

Professor, Anthropology  
B.A., M.A., Ph.D., University of Michigan. Former  
affiliation: University of Michigan.

### **David M. Harrington, Stevenson College (1975)**

Professor Emeritus, Psychology

## Teaching and Administrative Staff

B.A., Macalester College; Ph.D., University of California, Berkeley. Former affiliations: University of California, Berkeley; Macalester College.

### **Judith Harris-Frisk, Merrill College (1986)**

Lecturer, German Language

B.A., M.A., Ph.D., University of California, Berkeley. Former affiliations: Vassar College; University of Illinois, Urbana-Champaign; University of California, Berkeley.

### **Ellen L. Hart (1984)**

Lecturer, Writing

B.A., Mount Holyoke College; M.A., Mills College. Former affiliation: Laney College.

### **Grant A. Hartzog (1998)**

Professor, Molecular, Cell, and Developmental Biology

B.A., University of California, Berkeley; Ph.D., University of California, San Francisco.

### **Homayoun Hashemi (2004)**

Adjunct Professor, Electrical Engineering

B.S., University of Texas, Austin; M.S., M.A., Ph.D., University of California, Berkeley. Former affiliations: Stanford University, Sharif University of Technology, Bell Laboratories, Stanford Research Institute.

### **David Haussler, Crown College (1986)**

Professor, Biomolecular Engineering; Investigator, Howard Hughes Medical Institute

B.A., Connecticut College; M.S., California Polytechnic State University, San Luis Obispo; Ph.D., University of Colorado. Former affiliation: University of Denver.

### **John Hay, Porter College (1988)**

Professor Emeritus, History of Art and Visual Culture

B.A., Oxford University; Ph.D., Princeton University. Former affiliations: Institute of Fine Arts, New York University; Harvard University.

### **Sean A. Hayes (2007)**

Associate Adjunct Professor

Ph.D., University of California, Santa Cruz.

### **Barney W. Haynes (2010)**

Lecturer, Digital Arts and New Media

M.F.A., California College of Arts and Crafts. Concurrent Affiliation: Concurrent affiliation: California College of the Arts.

### **Alma Heckman (2015)**

Assistant Professor, History

Ph.D., University of California, Los Angeles.

### **Charles W. Hedrick, Cowell College (1990)**

Professor, History

B.A., Pitzer College; M.A., Ph.D., University of Pennsylvania. Former affiliation: State University of New York at Buffalo.

### **Alexander Heger (2005)**

Associate Adjunct Professor

Ph.D., Max Planck Institute für Astrophysik. Concurrent Affiliation: Current affiliation: Los Alamos National Laboratory.

### **David P. Helmbold, College Eight (1986)**

Professor, Computer Science

B.A., University of California, Berkeley; Ph.D., Stanford University.

### **Kimberly Helmer (2014)**

Lecturer with Security of Employment

B.A., University of California, Los Angeles; M.A., Monterey Institute of International Studies; Ph.D., University of Arizona. Former affiliation: John Jay College, City University of New York.

### **Margo J. Hendricks, Cowell College (1990)**

Associate Professor Emerita, Literature; Provost, Stevenson College

B.A., California State University, San Bernardino; M.A., Ph.D., University of California, Riverside. Former affiliation: San Jose State University.

### **Gail B. Hershatter, Merrill College (1991)**

Professor, History

B.A., Hampshire College; M.A., Ph.D., Stanford University. Former affiliation: Williams College.

### **Karlton E. Hester, Merrill College (2000)**

Professor, Music (Composition, Flute, and Saxophone)

B.M., University of Texas at El Paso; M.M., San Francisco State University; Ph.D., City University of New York Graduate Center. Former affiliation: Cornell University.

### **Clemens A. Heusch, Porter College (1969)**

Professor, Physics

Diploma, Technical University, Aachen; Ph.D., University of Munich. Former affiliations: California Institute of Technology; DESY, University of Hamburg.

### **Wendy D. Hibbert-Jones, Porter College (2002)**

Assistant Professor, Art

B.A., London University, London; M.A., Durham University, Durham, England; M.A., York University, York, England; M.F.A., Mills College. Former affiliations: California College of Arts; Mills College.

## Teaching and Administrative Staff

### **Henry R. Hilgard, Kresge College (1967)**

Professor Emeritus, Molecular, Cell, and Developmental Biology  
B.A., Harvard University; M.D., Stanford University;  
Ph.D., University of Minnesota. Former affiliations:  
University of Minnesota; American Heart Association.

### **Lindsay Hinck (1998)**

Professor, Molecular, Cell, and Developmental Biology  
B.S., Western Washington University; M.S., University of  
California, Davis; Ph.D., Stanford University.

### **Ralph T. Hinegardner, Crown College (1967)**

Professor Emeritus, Ecology and Evolutionary Biology  
B.A., Denison University; M.S., University of Southern  
California; Ph.D., University of Hawaii. Former  
affiliations: University of Kentucky; Columbia  
University.

### **Miriam C. Hitchcock (1993)**

Lecturer, Art  
B.A., University of California, Santa Cruz; M.F.A., Yale  
University.

### **David A. Hoffman (1990)**

Lecturer, Psychology  
B.A., Reed College; M.S., Ph.D., University of Oregon.

### **Karen D. Holl, College Eight (1995)**

Pepper-Giberson Professor, Environmental Studies  
B.S., Stanford University; Ph.D., Virginia Polytechnic  
Institute and State University.

### **Eli E. Hollander, Porter College (1974)**

Professor Emeritus, Film and Digital Media  
B.S., Juilliard School of Music; M.F.A., University of  
California, Los Angeles. Former affiliations:  
Encyclopaedia Britannica Films; Public Broadcasting  
Television Network (Los Angeles); Churchill Films; New  
York Philharmonic Orchestra.

### **Theodore R. Holman, Cowell College (1996)**

Professor, Chemistry and Biochemistry  
B.A., University of California, San Diego; Ph.D.,  
University of Minnesota at Minneapolis. Former  
affiliations: Harvard Medical School; Syntex  
Pharmaceuticals; University of California, Riverside.

### **Christine Hong (2009)**

Assistant Professor  
B.A., University of California, Los Angeles; Ph.D.,  
University of California, Berkeley.

### **Emily Honig, Kresge College (1992)**

Professor, Feminist Studies and History  
B.A., Brown University; M.A., Ph.D., Stanford University.  
Former affiliations: Yale University; Lafayette College.

### **Jennifer Horne (2011)**

Assistant Professor, Film and Digital Media  
B.A., Syracuse University; M.A., Ph.D., University of  
Minnesota. Former affiliation: The Catholic University  
of America.

### **Edward F. Houghton, Porter College (1970)**

Professor Emeritus, Music  
B.A., Rutgers University; M.A., University of Nevada;  
Ph.D., University of California, Berkeley. Former  
affiliations: University of California Education Abroad  
Program (Padua, Venice, Bologna); Rutgers University.

### **Jeremy K. Hourigan (2006)**

Associate Professor, Earth and Planetary Sciences  
B.S., University of Vermont; Ph.D. Stanford University.  
Former affiliations: Yale University; UC Santa Barbara.

### **David C. Hoy, Cowell College (1981)**

Professor, Philosophy  
B.A., Ph.D., Yale University. Former affiliations: Barnard  
College; Columbia University; University of California,  
Los Angeles; Princeton University; Yale University.

### **Jocelyn B. Hoy, Cowell College (1984)**

Lecturer, Philosophy  
M.Phil., Ph.D., Yale University. Former affiliation: Rider  
College.

### **Minghui Hu, College Eight (2005)**

Associate Professor, History  
Ph.D., University of California, Los Angeles. Former  
affiliation: University of Chicago.

### **Richard P. Hughey, Crown College (1991)**

Professor, Biomolecular Engineering and Computer  
Engineering; Vice Provost, Dean, Undergraduate Ed.  
B.A., B.S., Swarthmore College; Sc.M., Ph.D., Brown  
University.

### **A Y. Huginnie, Oakes College (1995)**

Assistant Professor, American Studies  
B.A., Radcliffe College, Harvard University; M.A., M.Phil.,  
Ph.D., Yale University. Former affiliation: University of  
Colorado, Boulder.

### **Akasha Hull, Kresge College (1988)**

## Teaching and Administrative Staff

Professor Emerita, Feminist Studies and Literature  
B.A., Southern University; M.A., Ph.D., Purdue  
University. Former affiliation: University of Delaware.

### **Robin Hunicke (2014)**

Lecturer, Digital Arts and New Media  
B.A., University of Chicago; M.S., Ph.D., Northwestern  
University. Former affiliations: University of Southern  
California, Northwestern University, Columbia  
University, Massachusetts Institute of Technology  
(MIT).

### **Fred A. Hunnicutt, Porter College (1969)**

Professor Emeritus, Art  
B.F.A., University of Texas; M.F.A., San Francisco Art  
Institute. Former affiliations: University of Texas at  
Arlington; Hornsey College of Art (London); Royal  
College of Art (London).

### **Donna M. Hunter, Porter College (1985)**

Associate Professor, History of Art and Visual Culture  
B.A., Vassar College; M.A., Ph.D., Harvard University.  
Former affiliation: Harvard University.

### **Aida Hurtado, Stevenson College (1983)**

Professor, Psychology  
B.A., Pan American University; M.A., Ph.D., University of  
Michigan, Ann Arbor. Former affiliation: Pan American  
University.

### **Greta K. Hutchison (1986)**

Lecturer, French  
B.A., M.A., University of Oregon, Eugene. Former  
affiliation: Cabrillo College.

### **Michael M. Hutchison, Cowell College (1985)**

Professor, Economics; Interim Dean, Division of Social  
Sciences  
B.A., University of California, Santa Cruz; Ph.D.,  
University of Oregon. Former affiliations: Federal  
Reserve Bank of San Francisco; University of Oregon;  
Institute for International Economic Studies, University  
of Stockholm.

### **Garth D. Illingworth, Crown College (1988)**

Professor, Astronomy and Astrophysics; Astronomer,  
UC Observatories/Lick Observatory  
B.Sc., University of Western Australia; Ph.D., Australian  
National University. Former affiliations: Space  
Telescope Science Institute; University of California,  
Berkeley; Kitt Peak National Observatory; Johns  
Hopkins University.

### **Robert W. Irion (1988)**

Senior Lecturer in Science Writing, Program Director  
B.S., Massachusetts Institute of Technology; Graduate  
Certificate, University of California, Santa Cruz.

### **Michael S. Isaacson (2003)**

Professor, Electrical Engineering; Narinder Singh  
Kapany Professor, Optoelectronics  
B.S., University of Illinois, Urbana-Champaign; S.M.,  
Ph.D., University of Chicago. Former affiliations:  
Brookhaven National Laboratory; University of Chicago;  
Cornell University.

### **John W. Isbister, Merrill College (1968)**

Emeritus, Economics  
B.A., Queen's University (Canada); Ph.D., Princeton  
University.

### **Junko Ito, Stevenson College (1986)**

Professor, Linguistics  
B.A., M.A., International Christian University (Tokyo);  
Ph.D., University of Massachusetts-Amherst.

### **Earl Jackson, Kresge College (1989)**

Associate Professor, Literature  
B.A., State University of New York at Buffalo; M.A.,  
Cornell University; M.A., Harvard University; M.A., Ph.D.,  
Princeton University. Former affiliation: University of  
Minnesota.

### **Kimberly M. Jannarone, Porter College (2001)**

Professor, Theater Arts  
B.A., Emory University; M.F.A., D.F.A., Yale School of  
Drama. Former affiliations: University of Washington;  
Smith College; Quinnipiac College.

### **Virginia Jansen, Cowell College (1975)**

Professor Emerita, History of Art and Visual Culture  
B.A., Smith College; M.A., Ph.D., University of California,  
Berkeley. Former affiliations: University of Santa Clara;  
Foothill College; Montreal Museum of Fine Arts.

### **Tesla E. Jeltema (2011)**

Assistant Professor, Physics  
Ph.D., Massachusetts Institute of Technology.

### **Arnav Jhala (2009)**

Assistant Professor, Computer Science  
B.E., Gujarat University, India; M.S., North Carolina State  
University, Raleigh; Ph.D., North Carolina State  
University, Raleigh. Research Assistant, Department of  
Computer Science, North Carolina State University,  
Raleigh..

## Teaching and Administrative Staff

### **Yishi Jin (1996)**

Associate Professor, Molecular, Cell, and Developmental Biology  
B.S., Beijing University; Ph.D., University of California, Berkeley.

### **Robert P. Johnson, Merrill College (1991)**

Professor, Physics  
B.S., University of Kansas; Ph.D., Stanford University.  
Former affiliations: PPE Division, CERN; University of Wisconsin-Madison.

### **Susanne L. Jonas, Merrill College (1986)**

Lecturer, Latin American and Latino Studies  
B.A., Radcliffe College; A.M.T., Harvard Graduate School of Education; M.S., Massachusetts Institute of Technology; Ph.D., University of California, Berkeley.

### **Burton F. Jones, Crown College (1975)**

Professor Emeritus, Astronomy and Astrophysics;  
Astronomer, UC Observatories/Lick Observatory  
B.S., M.S., Ph.D., University of Chicago.

### **Catherine A. Jones, Stevenson College (2007)**

Associate Professor, History  
B.A., Haverford College; Ph.D., Johns Hopkins University. Johns Hopkins University.

### **David E. Jones, Porter College (1988)**

Professor, Music; Provost, Porter College  
B.A., M.A., Ph.D., University of California, San Diego.  
Former affiliations: Dartmouth College; University of York (England); University of California, San Diego.

### **John O. Jordan, Kresge College (1968)**

Professor Emeritus, English Literature  
B.A., Princeton University; Ph.D., Stanford University.

### **Melissa S. Jurica (2003)**

Professor, Molecular, Cell, and Developmental Biology  
B.S., Montana State University; Ph.D., University of Washington, Fred Hutchinson Cancer Research Center.  
Former affiliation: Brandeis University.

### **Jonathan Kahana (2012)**

Associate Professor, Film and Digital Media  
B.F.A., B.A., York University; M.A., University of Minnesota; Ph.D., Rutgers University. Former affiliations: New York University; Bryn Mawr College.

### **Gretchen L. Kalonji (2005)**

Professor, Electrical Engineering  
B.S., Ph.D., Massachusetts Institute of Technology.

University of California, Office of the President;  
University of Washington; Max Planck Institut, Stuttgart, Germany; Massachusetts Institute of Technology; National Bureau of Standards.

### **Rohinton T. Kamakaka (2006)**

Associate Professor  
B.S., M.S., Poona University; Ph.D., Cambridge University; post-doctoral research, University of California, San Diego and University of California, Berkeley. Former affiliation: National Institutes of Health.

### **Stacy L. Kamehiro, Porter College (2002)**

Assistant Professor, History of Art and Visual Culture  
B.A., University of California, San Diego; M.A., Ph.D., University of California, Los Angeles. Former affiliation: University of Redlands.

### **Sheldon Kamieniecki, College Eight (2006)**

Professor and Dean of Social Sciences  
B.A., State University of New York; M.A., State University of New York; Ph.D., State University of New York. Former affiliation: University of Southern California.

### **Sung M. Kang (2001)**

Professor, Electrical Engineering; Dean, Jack Baskin School of Engineering  
B.S., Fairleigh Dickinson University; M.S., State University of New York at Buffalo; Ph.D., University of California, Berkeley. Former affiliations: University of Illinois, Urbana-Champaign; Swiss Federal Institute of Technology; University of Karlsruhe; Technical University of Munich.

### **Kevin Karplus, Cowell College (1986)**

Professor, Biomolecular Engineering  
B.S., Michigan State University; M.S., Ph.D., Stanford University. Former affiliation: Cornell University.

### **S P. Kashap, Cowell College (1969)**

Professor Emeritus, Philosophy  
B.A., M.A., University of Bombay; M.A., Edinburgh University; B.Litt., Oxford University. Former affiliations: Brown University; Wheaton College.

### **Jonathan R. Katznelson**

Lecturer, Applied Mathematics and Statistics  
B.Sc., Hebrew University; Ph.D., M.Sc., Stanford University. Former affiliations: Institut des Hautes Etudes Scientifiques (France); University of Maryland.

## Teaching and Administrative Staff

### **David E. Kaun, Crown College (1966)**

Professor, Economics  
B.S., Arizona State University; M.A., Claremont Graduate School; Ph.D., Stanford University. Former affiliations: University of Pittsburgh; Brookings Institution.

### **Alan H. Kawamoto, Crown College (1986)**

Associate Professor, Psychology  
B.S., Stanford University; Ph.D., Brown University.  
Former affiliation: Carnegie Mellon University.

### **Kathleen M. Kay (2008)**

Assistant Professor, Ecology and Evolutionary Biology  
B.S., University of California, Davis; Ph.D., Michigan State University. University of California, Santa Barbara; University of California, Berkeley.

### **David L. Keenan (2000)**

Lecturer, Chinese Language  
B.A., Dartmouth College; M.A., Ph.D., Harvard University.  
Former affiliations: Indiana University; Grinnell College; Colby College.

### **Sean Keilen (2012)**

Associate Professor, Literature  
B.A., Williams College; B.A., M.A., Cambridge University; M.A., Ph.D., Stanford University. Former affiliations: College of William and Mary; Princeton University; University of Pennsylvania.

### **Al Kelley, Stevenson College (1966)**

Professor Emeritus, Mathematics  
B.S., University of Montana; M.A., Ph.D., University of California, Berkeley. Former affiliations: Institute for Advanced Study (Princeton); National Academy of Sciences Exchange Fellowship to the USSR.

### **Douglas Kellogg (1995)**

Professor, Molecular, Cell, and Developmental Biology  
B.A., University of Wisconsin-Madison; Ph.D., University of California, San Francisco.

### **Dennis D. Kelso (1999)**

Pepper-Giberson Assistant Professor, Environmental Studies  
B.S., Iowa State University; J.D., Harvard University; Ph.D., University of California, Berkeley. Former affiliations: Department of Environmental Conservation, State of Alaska; Department of Fish and Game, State of Alaska.

### **Peter Kenez, Stevenson College (1966)**

Professor, History; Neufeld Levin Professor, Holocaust

Studies

B.A., Princeton University; M.A., Ph.D., Harvard University. Former affiliations: Oxford University; Massachusetts Institute of Technology.

### **Hi K. Kim, Porter College (1992)**

Associate Professor, Music  
B.A., Seoul National University (Korea); M.A., Ph.D., University of California, Berkeley; D.E.A., IRCAM and Ecole Normale Superieure (Paris). Concurrent Affiliation: Founder and Artistic Director, Pacific Rim Music Festival. Former affiliation: San Francisco State University.

### **Jungmi Kim (2007)**

Lecturer, Writing  
B.A., Sookmyung Women's University; M.A., Ph.D., Temple University.

### **Lahn S. Kim, Porter College (2002)**

Associate Professor, Film and Digital Media  
B.A., Smith College; M.A., Ph.D., University of California, Los Angeles. Former affiliation: Northwestern University.

### **Julie H. Kimball (1983)**

Physical Education Instructor  
B.A., University of California, Santa Cruz. Former affiliation: Ramani Iyengar Yoga Institute (India).

### **James C. King (2008)**

Research Associate, Computer Science  
B.A., Washington State University; M.A., Washington State University; Ph.D., Carnegie Mellon University.

### **Noel Q. King, Merrill College (1968)**

Professor Emeritus, History and Comparative Religion  
M.A., Oxford University; Ph.D., University of Nottingham. Former affiliations: University of Nottingham; University of Ghana; University of East Africa (Makerere).

### **Robin Y. King (1997)**

Lecturer, Writing  
B.A., M.F.A., University of California, San Diego.

### **Russell L. Kingon (2000)**

Physical Education Instructor  
B.S., Clemson University.

### **Sharon A. Kinoshita, Oakes College (1987)**

Professor, Literature  
A.B., M.A., Ph.D., University of California, Berkeley.

## Teaching and Administrative Staff

Former affiliation: Stanford University.

### **Norma Klahn, Merrill College (1989)**

Professor, Literature

B.A., M.A., Queens College, City University of New York;  
Ph.D., State University of New York at Stony Brook.

Former affiliation: Columbia University.

### **Kenneth M. Kletzer, Stevenson College (1992)**

Professor, Economics

B.S., Stanford University; M.S., University of  
Washington; Ph.D., University of California, Berkeley.

Former affiliations: University of California, Davis; Yale  
University.

### **Lori G. Kletzer, Merrill College (1993)**

Professor Emerita, Economics

B.A., Vassar College; Ph.D., University of California,  
Berkeley. Former affiliation: Williams College.

### **Robert Klevan (1998)**

Lecturer, Music (Wind Ensemble)

B.M., M.M., University of the Pacific; Ph.D., University of  
Texas at Austin. Concurrent affiliation: Monterey  
Peninsula College.

### **David S. Kliger, Oakes College (1971)**

Research Professor Emeritus, Chemistry and  
Biochemistry

B.S., Rutgers University; Ph.D., Cornell University.  
Former affiliation: Harvard University.

### **Elise Knittle, Kresge College (1988)**

Professor, Earth and Planetary Sciences

A.B., Smith College; Ph.D., University of California,  
Berkeley.

### **Nobuhiko P. Kobayashi (2007)**

Associate Professor, Electrical Engineering

B.S., Aoyama Gakuin University, Japan; M.S., University  
of California, Los Angeles; Ph.D., University of  
California, Los Angeles. Concurrent Affiliation: NASA  
Ames Research Center. Hewlett-Packard Labs;  
Electronics Research Lab, University of California,  
Berkeley..

### **Paul L. Koch, Crown College (1996)**

Professor, Earth and Planetary Sciences

B.A., University of Rochester; M.S., Ph.D., University of  
Michigan. Former affiliations: Smithsonian Institution;  
Carnegie Institution of Washington; Princeton  
University.

### **Phokion Kolaitis, College Eight (1988)**

Professor, Distinguished Professor of Computer Science  
Diploma, University of Athens; M.A., Ph.D., University of  
California, Los Angeles. Former affiliations: Stanford  
University; Occidental College; University of Chicago.

### **Joseph P. Konopelski, Stevenson College (1984)**

Professor, Chemistry and Biochemistry

B.A., M.A., Johns Hopkins University; Ph.D., Stanford  
University. Former affiliations: Universite Louis Pasteur  
(Strasbourg); University of Pennsylvania.

### **David C. Koo, College Eight (1988)**

Professor, Astronomy and Astrophysics; Astronomer,  
UC Observatories/Lick Observatory

A.B., Cornell University; M.A., Ph.D., University of  
California, Berkeley. Former affiliation: Space Telescope  
Science Institute.

### **Athanasios Kottas (2002)**

Professor, Applied Mathematics and Statistics

B.Sc., M.Sc., University of Ioannina (Greece); Ph.D.,  
University of Connecticut. Former affiliation: Duke  
University.

### **Robert P. Kraft, Stevenson College (1967)**

Professor Emeritus, Astronomy and Astrophysics;  
Astronomer Emeritus, UC Observatories/Lick  
Observato

B.S., M.S., University of Washington; Ph.D., University of  
California, Berkeley.

### **Thomas M. Kroeger (2011)**

Assistant Adjunct Professor, Computer Science

B.S.E., University of Michigan, Ann Arbor; M.S., Ph.D.,  
University of California, Santa Cruz. Sandia National  
Laboratories, Livermore, CA.; UC Santa Cruz; Validus  
Medical Information Systems, Santa Cruz.

### **Mark Krumholz**

Associate Professor, Astronomy and Astrophysics

B.A., Princeton University; M.A., Ph.D., University of  
California, Berkeley.

### **Nancy Krusoe**

Lecturer and Crown College Writing Coordinator

Emerita, Writing

B.A., Georgia State University, Atlanta; M.A., California  
State University Northridge. California State University  
Northridge.

### **Jacqueline W. Ku, Cowell College (1984)**

Lecturer, Chinese Language

## Teaching and Administrative Staff

B.A., Shih-chien College (Taiwan). Former affiliations: Defense Language Institute; Inter-University Program for Chinese Language Studies (Taipei); Stanford University of Asian Languages Summer Languages Institute; Middlebury College Summer Language Institute.

### **Joel A. Kubby (2005)**

Associate Professor, Electrical Engineering  
B.A., University of California, Berkeley; M.S., Ph.D., Cornell University. Former affiliation: Xerox Corporation.

### **Raphael M. Kudela (1999)**

Professor, Ocean Sciences  
B.S., Drake University; Ph.D., University of Southern California. Concurrent affiliation: Monterey Bay Aquarium Research Institute.

### **Sri H. Kurniawan (2007)**

Associate Professor, Computer Engineering  
B.S., Satya Wacana University; M.S., Hong Kong University of Science and Technology; Ph.D., Wayne State University. Former affiliation: University of Manchester.

### **Frederick H. Kuttner (1996)**

Lecturer, Physics  
B.S., Massachusetts Institute of Technology; M.B.A., Santa Clara University; M.S., Ph.D., University of California, Santa Cruz. Former affiliations: Litton Industries; Northwestern Polytechnic University.

### **William A. Ladusaw, Cowell College (1984)**

Professor, Linguistics; Interim Vice Provost and Dean, Undergraduate Education  
B.A., University of Kentucky; M.A., Ph.D., University of Texas at Austin. Former affiliations: University of Connecticut; University of California, Los Angeles; University of Iowa.

### **Edward M. Landesman, Crown College (1966)**

Professor Emeritus, Mathematics  
B.A., M.A., Ph.D., University of California, Los Angeles. Former affiliation: University of California, Los Angeles.

### **Ann M. Lane, Oakes College (1980)**

Emerita, American Studies  
B.A., Ph.D., University of California, Santa Cruz.

### **Jean H. Langenheim (1966)**

Professor Emerita, Ecology and Evolutionary Biology  
B.S., University of Tulsa; M.S., Ph.D., University of

Minnesota. Former affiliations: Harvard University; University of California, Berkeley; University of Illinois, Urbana-Champaign; San Francisco College for Women; Mills College.

### **Regina D. Langhout (2006)**

Associate Professor, Psychology  
B.A., University of California, Santa Cruz; A.M., Ph.D., University of Illinois. Former affiliations: Wesleyan University; Children's Advocacy Institute and Center for Public Interest Law, University of San Diego.

### **Ruth Langridge (2012)**

Lecturer, Legal Studies  
B.S., Antioch College; M.A., Harvard University; M.S., Oregon State University; Ph.D., University of California, Berkeley.

### **Leo F. Laporte, Crown College (1971)**

Professor Emeritus, Earth and Planetary Sciences  
B.A., Ph.D., Columbia University. Former affiliation: Brown University.

### **Bruce D. Larkin, Cowell College (1965)**

Professor Emeritus, Politics  
B.A., University of Chicago; M.A., Ph.D., Harvard University.

### **Tracy Larrabee, College Eight (1990)**

Professor, Computer Engineering  
B.S., California Institute of Technology; M.S., Ph.D., Stanford University. Former affiliations: Hewlett-Packard Laboratories; Xerox PARC; Digital Equipment Corporation.

### **Matthew Lasar (2003)**

Lecturer, History  
Ph.D., Claremont Graduate University. Former affiliation: University of California, Riverside.

### **Kimberly J. Lau (2006)**

Professor, Literature; Provost, Oakes College; American Studies Program Director  
B.A., University of California, Berkeley; M.L.I.S., University of California, Berkeley; Ph.D., University of Pennsylvania. Former Affiliation: University of Utah.

### **Gregory P. Laughlin (2001)**

Associate Professor, Astronomy and Astrophysics  
B.S., University of Illinois, Urbana-Champaign; M.S., Ph.D., University of California, Santa Cruz. Former affiliation: NASA Ames Research Center.

## Teaching and Administrative Staff

### **Brenda K. Laurel (2013)**

Adjunct Professor, Computer Science  
Ph.D., Ohio State University. Former affiliation:  
California College of the Arts.

### **Kenneth E. Laws**

Assistant Adjunct Professor, Electrical Engineering  
B.S., San Francisco State University; M.S., Ph.D.,  
University of California, Santa Cruz.. Former affiliation:  
University of Michigan..

### **Thorne Lay, Porter College (1989)**

Professor, Earth and Planetary Sciences  
B.S., University of Rochester; M.S., Ph.D., California  
Institute of Technology. Former affiliations: University  
of Michigan, Ann Arbor; California Institute of  
Technology.

### **John Jota Leanos (2009)**

Assistant Professor, Film and Digital Media  
M.F.A, San Francisco State University. California College  
of the Arts; Arizona State University.

### **Campbell Leaper, Cowell College (1988)**

Professor, Psychology; Provost, Colleges Nine and Ten  
B.A., Boston University; M.A., Ph.D., University of  
California, Los Angeles. Former affiliations: Harvard  
Medical School; California State University, Northridge;  
California State University, Long Beach.

### **Burney J. Leboeuf, Crown College (1967)**

Professor Emeritus, Ecology and Evolutionary Biology  
B.A., University of California, Berkeley; M.A., San  
Francisco State College; Ph.D., University of California,  
Berkeley. Former affiliations: University of California,  
Davis; Harvard University.

### **Herbert K. Lee, College Nine (2002)**

Professor, Applied Mathematics and Statistics  
B.S., Yale University; M.S., Ph.D., Carnegie Mellon  
University. Former affiliation: Duke University.

### **Jimin Lee, Porter College (2003)**

Professor, Art  
B.F.A., M.F.A., Seoul National University (Korea); M.F.A.,  
San Francisco Art Institute. Former affiliation:  
California State University, Hayward.

### **Ju Hee Lee (2013)**

Assistant Professor, Applied Mathematics and Statistics  
B.S., Ewha Women's University, Seoul, Korea; M.S.,  
Ph.D., Ohio State University. Former affiliations: Ohio  
State University; University of Texas, M.D. Anderson

Cancer Center.

### **H M. Leicester, Cowell College (1967)**

Professor, English Literature  
B.A., M.A., Ph.D., Yale University. Former affiliation: Yale  
University.

### **Anatole Leikin, Porter College (1989)**

Professor, Music  
B.A., Gnesin State Conservatory (Moscow); M.A., Gnesin  
State Musical and Pedagogical Institute (Moscow);  
Ph.D., University of California, Los Angeles. Former  
affiliations: Gnesin State Conservatory; University of  
California, Los Angeles.

### **Herve Lemasec, Cowell College (1978)**

Lecturer, French Language  
Diplôme d'Etudes Supérieures, Nantes University  
(France); Diplôme de Conseiller Pédagogique,  
University of Aix-en-Provence (France).

### **Deborah K. Letourneau, College Eight (1984)**

Professor, Ecology (Environmental Studies)  
B.S., M.S., University of Michigan; Ph.D., University of  
California, Berkeley.

### **Bruce C. Levine (1997)**

Professor Emeritus, History  
B.A., University of Michigan, Ann Arbor; M.A., Ph.D.,  
University of Rochester. Former affiliation: University  
of Cincinnati.

### **Robert A. Levinson, Stevenson College (1985)**

Professor Emeritus, Computer Science  
B.S., University of Minnesota at Minneapolis-St. Paul;  
Ph.D., University of Texas at Austin. Former affiliations:  
University of Texas at Austin; University of Minnesota.

### **Debra K. Lewis, Crown College (1991)**

Professor, Mathematics  
B.A., Ph.D., University of California, Berkeley. Former  
affiliation: Institute for Math and Its Applications,  
University of Minnesota.

### **Yat Li, Crown College (2007)**

Associate Professor, Chemistry and Biochemistry  
B.Sc., University of Hong Kong; Ph.D., University of Hong  
Kong.

### **Peter E. Limbrick, Porter College (2001)**

Associate Professor, Film and Digital Media  
B.A., M.A., University of Otago (New Zealand); Ph.D., La  
Trobe University (Australia). Former affiliations: Duke

## Teaching and Administrative Staff

University; Stanford University; University of California, Berkeley.

### **Douglas N. Lin, Crown College (1979)**

Professor, Astronomy and Astrophysics  
B.S., McGill University; Ph.D., Cambridge University.  
Former affiliation: Harvard University.

### **Daniel T. Linger, Stevenson College (1983)**

Professor Emeritus, Anthropology  
B.A., University of Michigan; M.A., Ph.D., University of California, San Diego. Former affiliation: University of California, San Diego.

### **Roger G. Linington, Crown College (2007)**

Associate Professor, Chemistry and Biochemistry  
B.Sc., University of Leeds, United Kingdom; Ph.D., University of British Columbia, Canada.

### **Ronnie D. Lipschutz, Stevenson College (1990)**

Professor, Politics  
B.A., B.S., University of Texas at Austin; M.S., Massachusetts Institute of Technology; Ph.D., University of California, Berkeley.

### **George Lipsitz, Oakes College (2003)**

Professor, American Studies  
A.B., Washington University; M.A., University of Missouri, St. Louis; Ph.D., University of Wisconsin.  
Former affiliations: University of California, San Diego; University of Minnesota; University of Houston at Clear Lake City.

### **Alan M. Litke (1984)**

Adjunct Professor, Physics  
B.A., Johns Hopkins University; M.A., Ph.D., Harvard University.

### **Norman Locks, Porter College (1977)**

Professor, Art  
B.F.A., San Francisco Art Institute; M.A., San Francisco State University.

### **Suresh K. Lodha, Porter College (1992)**

Professor, Computer Science  
M.Sc., Indian Institute of Technology (Kanpur); M.A., University of California, Berkeley; Ph.D., Rice University.  
Former affiliations: IBM Thomas J. Watson Research Center; IBM Almaden Research Center.

### **Peter M. Loftus (1982)**

Lecturer, Art  
BFA, Maryland Institute College of Art; MFA, University

of Pennsylvania, Philadelphia. Former affiliation: Cabrillo Community College.

### **Michael E. Loik (1998)**

Associate Professor, Environmental Studies  
B.Sc., M.Sc., University of Toronto; Ph.D. University of California, Los Angeles. Former affiliations: University of California, Berkeley; California State University, San Bernardino.

### **Robert S. Lokey (2002)**

Professor, Chemistry and Biochemistry  
B.S., Trinity University (San Antonio); Ph.D., University of Texas at Austin.

### **Amy J. Lonetree, Oakes College**

Associate Professor, American Studies, American Studies Program Director  
B.A., University of Minnesota; M.A., University of Chicago; M.A., Indiana University; Ph.D., University of California, Berkeley.

### **Darrell D. Long, Crown College (1988)**

Professor, Computer Science  
B.S., San Diego State University; M.S., Ph.D., University of California, San Diego.

### **Charles L. Lord, Porter College (1987)**

Professor, Film and Digital Media  
B.A., Tulane University. Former affiliation: University of California, San Diego.

### **Murray K. Low (2008)**

Lecturer, Music, (Jazz Theory)  
BSEE, University of California, Berkeley. Former affiliations: Stanford University, University of California, Berkeley.

### **Todd M. Lowe (2001)**

Professor, Biomolecular Engineering  
B.A., Williams College; Ph.D., Washington University.  
Former affiliation: Washington University.

### **Flora E. Lu (2008)**

Associate Professor, Latin American and Latino Studies  
A.B., Stanford University; Ph.D., University of North Carolina at Chapel Hill. Former affiliations: University of North Carolina at Chapel Hill; Stanford University.

### **Paul M. Lubeck, College Eight (1973)**

Professor Emeritus, Sociology  
B.A., St. Michael's College; M.A., Ph.D., Certificate in African Studies, Northwestern University.

## Teaching and Administrative Staff

### **Robert A. Ludwig, Crown College (1979)**

Professor, Molecular, Cell, and Developmental Biology  
B.S., University of Michigan; Ph.D., Yale University.  
Former affiliation: Massachusetts Institute of Technology.

### **Brij D. Lunine (2000)**

Lecturer, Writing  
Ph.D., University of New Mexico. Former affiliation:  
Georgiana Bruce Kirby Preparatory School.

### **Irene E. Lusztig (2008)**

Associate Professor, Film and Digital Media  
B.A., Harvard University; M.F.A., Bard College. Harvard  
University; State University of New York, Purchase;  
Temple University.

### **Boreth J. Ly (2008)**

Assistant Professor, History of Art and Visual Culture  
B.A., Bates College, Lewiston, Maine; Ph.D., University of  
California, Berkeley..

### **John P. Lynch, Cowell College (1970)**

Professor Emeritus, Classics (Literature)  
B.A., Harvard College; M.A., M.Phil., Ph.D., Yale  
University.

### **Jennifer K. Lynn (2010)**

Lecturer, Greek, Language Program  
A.B., Ph.D., Columbia University. Former affiliations:  
The Hotchkiss School, The Berkeley Carroll School,  
Oberlin College, Princeton University, Columbia  
University.

### **Bruce E. Lyon (1997)**

Professor, Ecology and Evolutionary Biology  
B.Sc., McGill University; M.Sc., Queen's University; Ph.D.,  
Princeton University.

### **R. B. Mac Farlane (2005)**

Adjunct Professor, Ecology and Evolutionary Biology  
B.S., Pennsylvania State University; M.S., Florida State  
University; Ph.D., Florida State University. Former  
affiliation: National Oceanic and Atmospheric  
Administration (NOAA).

### **Pavel Machotka, Porter College (1970)**

Professor Emeritus, Psychology  
B.A., University of Chicago; M.A., Ph.D., Harvard  
University; (Hon.) Dr. h. c., Charles University (Prague).  
Former affiliations: Harvard University; University of  
Colorado.

### **Nathaniel E. Mackey, Kresge College (1979)**

Professor Emeritus, Literature  
B.A., Princeton University; Ph.D., Stanford University.  
Former affiliations: University of Southern California;  
University of Wisconsin-Madison.

### **Pascale Mackey, Kresge College (1986)**

Professor Emerita, Literature and Language Studies  
B.A., M.A., Oxford University; Ph.D., Princeton  
University.

### **Wesley F. Mackey (1993)**

Lecturer, Computer Science  
B.S., M.S., Ph.D., University of Manitoba.

### **Piero Madau (2000)**

Professor, Astronomy and Astrophysics  
B.S., University of Florence; Ph.D., International School  
for Advanced Studies (Trieste). Former affiliation:  
Cambridge University.

### **Patrice Maginnis, Cowell College (1986)**

Lecturer, Music (Voice)  
B.A., M.A., San Jose State University. Former affiliations:  
San Jose State University; De Anza College; Opera San  
Jose.

### **Roy T. Malan (1980)**

Lecturer, Music (Violin and Viola)  
Diplomas, Royal Academy of Music, Juilliard School of  
Music, and Curtis Institute of Music. Concurrent  
Affiliation: Concurrent affiliations: San Francisco Ballet  
Orchestra; San Francisco Contemporary Music Players;  
Telluride Chamber Music Festival; Rocky Ridge Music  
Center. Former affiliations: Ithaca College; San  
Francisco Conservatory of Music; San Francisco State  
University; University of Nevada at Reno; Stanford  
University.

### **Carl G. Maltzahn (2006)**

Associate Adjunct Professor, Computer Science  
Ph.D., Computer Science, University of Colorado at  
Boulder; Diplom-Informatiker, University of Passau,  
Germany. Former Affiliations: NetApp; Digital  
Equipment Corporation.

### **Roberto Manduchi (2001)**

Professor, Computer Engineering  
Laurea, Dottorato di ricerca, University of Padova  
(Italy). Former affiliation: University of Southern  
California.

## Teaching and Administrative Staff

### **Marc S. Mangel, Stevenson College (1996)**

Distinguished Professor Emeritus and Research Professor, Applied Mathematics and Statistics  
B.S., M.S., University of Illinois; Ph.D., University of British Columbia. Former affiliations: University of California, Davis; Center for Naval Analyses.

### **Patrick E. Mantey, Merrill College (1984)**

Associate Dean, Jack Baskin Endowed Professor, CITRIS and ITI Director

B.S., University of Notre Dame; M.S., University of Wisconsin; Ph.D., Stanford University. Former affiliations: Stanford University; IBM Research.

### **Bruce H. Margon, Crown College (2006)**

Professor of Astronomy and Astrophysics/Vice Chancellor, Research

A.B., Columbia University; M.S., Ph.D., University of California, Berkeley.. Space Telescope Science Institute.

### **Baldo B. Marinovic (1996)**

Lecturer

Ph.D., University of Western Australia.

### **Justin Marion (2005)**

Associate Professor, Economics

B.B.A., B.S., Southern Methodist University; Ph.D., University of Chicago. Former affiliation: Graduate School of Business, University of Chicago.

### **David S. Marriott, Oakes College (2003)**

Associate Professor, History of Consciousness

B.A. (Hons., 1st class), M.A., Ph.D., University of Sussex. Former affiliation: University of London.

### **George E. Marsh (1982)**

Lecturer, Music (Percussion)

University of Illinois, Champaign/Urbana. Concurrent affiliation: Sonoma State University. Former affiliation: San Francisco Conservatory of Music.

### **Snyder Martha**

Lecturer in Science Writing

B.A., Universal Technical Institute, Phoenix.

### **Alma R. Martinez, Kresge College (2001)**

Professor Emerita, Theater Arts (Acting)

B.A., Whittier College; M.F.A., University of Southern California; Ph.D. cand., Stanford University. Former affiliations: Aquarius Theater; El Teatro Campesino; Universal Studios.

### **Lourde Martinez-Echazabal, Merrill College (1990)**

Professor, Latin American Studies

B.A., M.A., Ph.D., University of California, San Diego. Former affiliation: Rutgers University.

### **Pradip Mascharak, Oakes College (1984)**

Professor, Chemistry and Biochemistry

B.S., M.S., University of Burdwan (India); Ph.D., Indian Institute of Technology (Kanpur). Former affiliations: Stanford University; Massachusetts Institute of Technology.

### **Geoffrey Mason, Kresge College (1973)**

Professor, Mathematics

B.Sc., University of London; M.S., Ph.D., University of Illinois, Chicago.

### **Dominic W. Massaro, Porter College (1979)**

Emeritus, Psychology

B.A., University of California, Los Angeles; M.A., Ph.D., University of Massachusetts. Former affiliation: University of Wisconsin.

### **Mark F. Massoud (2009)**

Assistant Professor, Politics

B.A., M.A., University of Notre Dame; Law degree, Ph.D., University of California, Berkeley. Stanford University Center on Democracy, Development, and the Rule of Law..

### **Michael J. Mateas (2006)**

Professor, Computer Science

B.S., University of the Pacific, 1989; M.S., Portland State University, 1993; Ph.D., Carnegie Mellon University, 2002. The Georgia Institute of Technology.

### **Mara Mather (2001)**

Associate Professor, Psychology

A.B., Stanford University; Ph.D., Princeton University.

### **Richard S. Mather, Cowell College (1965)**

Professor Emeritus, History

B.A., M.A., Ph.D., University of California, Berkeley.

### **Andrew S. Mathews (2007)**

Associate Professor, Anthropology

B.Sc., Leeds University, England; M.Sc., Oxford University, England, M.Phil., Ph.D., Yale University. Florida International University.

### **William G. Mathews, Porter College (1970)**

Research Professor Emeritus, Astronomy and Astrophysics

B.S., University of Washington; M.S., University of

## Teaching and Administrative Staff

Chicago; Ph.D., University of California, Berkeley.  
Former affiliation: University of California, San Diego.

### **Dean P. Mathiowetz, Merrill College (2003)**

Associate Professor, Politics  
B.A., University of Minnesota; M.A., Ph.D., University of California, Berkeley.

### **Claire E. Max (1999)**

Professor, Astronomy and Astrophysics; Astronomer,  
UC Observatories/Lick Observatory  
A.B., Harvard University; Ph.D., Princeton University.

### **Melanie J. Mayer, Cowell College (1972)**

Professor Emerita, Psychology  
A.B., Cornell University; M.A., University of Wisconsin-  
Madison; Ph.D., University of California, San Diego.

### **Phillip McCalman, Crown College (1999)**

Associate Professor, Economics  
B.Comm., M.Comm., University of Melbourne; Ph.D.,  
University of Wisconsin-Madison. Former affiliation:  
Australian National University.

### **Matthew D. McCarthy (2001)**

Associate Professor, Ocean Sciences  
B.S., University of California, San Diego; Ph.D.,  
University of Washington. Former affiliation: Carnegie  
Institution of Washington; University of Hawaii; Ecole  
Normale Supérieure Chimie, Paris.

### **James McCloskey, Stevenson College (1988)**

Professor, Linguistics  
B.A., University College Dublin; Ph.D., University of  
Texas at Austin. Former affiliations: University College  
Dublin; Dublin Institute for Advanced Studies;  
University of Texas at Austin.

### **Jennie L. McDade, Porter College (1987)**

Professor Emerita, Art  
B.F.A., University of Southern Mississippi; M.F.A.,  
University of Georgia.

### **Charles E. McDowell, Porter College (1985)**

Professor, Computer Science  
B.S., California Polytechnic State University, San Luis  
Obispo; M.S., Ph.D., University of California, San Diego.  
Former affiliations: University of California, San Diego;  
Lawrence Livermore National Laboratory; Digital  
Equipment Corporation.

### **Dennis C. McElrath, Stevenson College (1965)**

Professor Emeritus, Sociology

B.A., University of California, Santa Barbara; M.A.,  
University of California, Los Angeles; Ph.D., Yale  
University. Former affiliations: University of Southern  
California; Northwestern University; University of  
California Education Abroad Program (Padua).

### **Grant L. McGuire (2009)**

Assistant Professor, Linguistics  
B.A., University of Illinois, Urbana-Champaign; M.A.,  
Ph.D., Ohio State University. University of California,  
Berkeley.

### **Steven Mc Kay, College Nine (2007)**

Associate Professor, Sociology  
Ph.D., University of Wisconsin-Madison; M.A.,  
University of Wisconsin-Madison; B.A., University of  
California, Berkeley.

### **Patrick M. Mc Kercher, College Eight (1995)**

Lecturer, Writing  
B.A., M.A., San Diego State University; Ph.D., University  
of British Columbia.

### **Barry S. McLaughlin, Merrill College (1966)**

Professor Emeritus, Psychology  
B.A., M.S., St. Louis University; Ph.D., Harvard  
University. Former affiliation: University of California  
Education Abroad Program (Göttingen).

### **Ken J. McLaughlin (2008)**

Lecturer in Science Writing, Science Communication  
B.A., State Univ. of New York at Albany; M.A., Stanford  
University.

### **Karen C. Mc Nally, Kresge College (1981)**

Professor Emerita, Earth and Planetary Sciences  
B.A., M.A., Ph.D., University of California, Berkeley.  
Former affiliation: California Institute of Technology.

### **Marcia K. McNutt (1998)**

Professor Emerita, Earth and Planetary Sciences  
B.A., Colorado College; Ph.D., Scripps Institution of  
Oceanography, University of California, San Diego;  
(Hon.) D.Sc., Colorado College. Concurrent affiliation:  
Monterey Bay Aquarium Research Institute. Former  
affiliation: Massachusetts Institute of Technology.

### **Rita Mehta (2010)**

Assistant Professor, Ecology and Evolutionary Biology  
B.S., B.A., University of California, Berkeley; M.S.,  
University of Texas, Tyler; Ph.D., University of  
Tennessee, Knoxville. Former affiliation: University of  
California, Davis.

## Teaching and Administrative Staff

### **Robert L. Meister, Kresge College (1973)**

Professor of Political and Social Thought and History of Consciousness  
B.A., Princeton University; Ph.D., Harvard University.  
Former affiliation: Harvard University.

### **Martha Mendoza**

Lecturer in Science Writing  
B.A., Universal Technical Institute, Phoenix.

### **Tanya H. Merchant, Porter College (2007)**

Assistant Professor  
B.M., The Peabody Conservatory, Institute of Johns Hopkins University; M.Mus., Goldsmiths College, University of London; Ph.D., University of California Los Angeles.

### **Daniel M. Merl (2011)**

Assistant Adjunct Professor, Applied Mathematics and Statistics  
B.A., Dartmouth College; M.S., Ph.D., University of California, Santa Cruz. Lawrence Livermore National Laboratory, Livermore, CA.; Duke University, Durham, N.C.; Cornell University, Ithaca, N.Y..

### **R A. Mester, Stevenson College (1989)**

Professor, Linguistics  
Staatsexamen, University of Göttingen (Germany);  
Ph.D., University of Massachusetts-Amherst.

### **Kathryn E. Metz, Porter College (1971)**

Professor Emerita, Art  
B.F.A., Bowling Green State University; M.A., University of California, Los Angeles. Former affiliations: New York University; College of St. Benedict; St. John's University.

### **Jacob B. Michaelsen, Crown College (1965)**

Professor Emeritus, Economics  
B.A., M.B.A., Ph.D., University of Chicago. Former affiliation: University of California, Berkeley.

### **Edward T. Migliore (1986)**

Lecturer, Mathematics  
B.A., Rutgers University; M.A., Ph.D., University of California, Santa Cruz. Former affiliation: Monterey Peninsula College.

### **Peyman Milanfar (1999)**

Professor, Electrical Engineering  
B.S., University of California, Berkeley; Ph.D., Massachusetts Institute of Technology. Former affiliation: Stanford Research Institute International.

### **Gary B. Miles, Cowell College (1971)**

Professor Emeritus, History  
B.A., Colby College; M.A., Harvard University; Ph.D., Yale University. Former affiliations: Phillips Academy; Wesleyan University; University of Texas.

### **Adam S. Millard-Ball (2012)**

Assistant Professor, Environmental Studies  
M.A., University of Edinburgh; Ph.D., Stanford University. Former affiliation: McGill University..

### **Ethan L. Miller, Crown College (2000)**

Professor, Computer Science  
Sc.B., Brown University; M.S., Ph.D., University of California, Berkeley. Former affiliation: University of Maryland, Baltimore County.

### **Joseph S. Miller, Crown College (1967)**

Professor, Astronomy and Astrophysics; Henry Bachmann Professor, Astronomical Instrumentation; Direc  
B.A., University of California, Los Angeles; M.S., Ph.D., University of Wisconsin.

### **Leta E. Miller, Porter College (1978)**

Professor, Music (Music History and Flute)  
B.A., Stanford University; M.Mus., Hartt College of Music, University of Hartford; Ph.D., Stanford University. Former affiliations: Foothill College; Hartt College of Music.

### **Mary K. Miller**

Lecturer in Science Writing  
B.A., University of California, Santa Cruz.

### **Tyrus H. Miller, Cowell College (1999)**

Professor, Literature; Provost, Cowell College  
B.A., M.A., M.A., Johns Hopkins University; Ph.D., Stanford University.

### **Glenn L. Millhauser, Cowell College (1988)**

Professor, Chemistry and Biochemistry  
B.S., California State University, Los Angeles; M.S., Ph.D., Cornell University.

### **Marcia Millman, Stevenson College (1971)**

Professor, Sociology  
B.A., Ph.D., Brandeis University.

### **Dejan Milutinovic (2009)**

Associate Professor, Computer Engineering  
Diplom-Ingenieur and M.S., Univerisity of Belgrade,

## Teaching and Administrative Staff

Yugoslavia; Ph.D., Technical University of Lisbon, Portugal. Army Reserach Office (ARO), North Carolina, National Research Council Research Associate; Duke University, Durham, North Carolina, Postdoctoral Researcher; Utrecht Univeristy, The Netherlands, Postdoctoral Researcher.

### **Natalio B. Mingo (2007)**

Associate Adjunct Professor, Electrical Engineering M.S., Ph.D., Universidad Autonoma de Madrid. Former affiliations: CEA-Grenoble; Himeji Institute of Technology..

### **Patricia L. Mitchell (2002)**

Lecturer, Music (Oboe)  
B.M., San Jose State University.

### **Richard R. Mitchell (1983)**

Lecturer, Mathematics  
B.A., M.A., Ph.D., University of California, Santa Cruz.

### **Owen Miyoshi (2002)**

Lecturer, Music (Trumpet)  
B.M., San Francisco Conservatory of Music.

### **Helene Moglen, Kresge College (1978)**

Emerita  
B.A., Bryn Mawr College; M.A., Ph.D., Yale University. Former affiliations: State University of New York at Purchase; New York University.

### **Ellen L. Moir (1980)**

Director, New Teacher Center  
B.A., California State University, Northridge; Bilingual Cross-Cultural Specialist Credential, University of San Diego (Mexico); M.A., San Jose State University.

### **Kivie Moldave (1984)**

Professor Emeritus, Molecular, Cell, and Developmental Biology  
B.A., University of California, Berkeley; M.S., Ph.D., University of Southern California. Former affiliations: Tufts University; University of Pittsburgh; University of California, Irvine.

### **Radhika V. Mongia (2000)**

Assistant Professor, Feminist Studies  
B.A., Miranda House College, University of Delhi; M.S., M.A., Northern Illinois University; Ph.D., University of Illinois, Urbana-Champaign.

### **James C. Monroe (2006)**

Associate Professor, Anthropology

Ph.D., University of California, Los Angeles. Former affiliation: Departments of African and African-American Studies, Anthropology, and History, Washington University in St. Louis.

### **Richard Montgomery, Crown College (1990)**

Professor, Mathematics  
B.A., Sonoma State University; Ph.D., University of California, Berkeley. Former affiliation: Massachusetts Institute of Technology.

### **Megan C. Moodie (2009)**

Assistant Professor, Anthropology  
B.A., Skidmore College; Ph.D., University of California, Santa Cruz.

### **Andrew M. Moore (2006)**

Professor, Ocean Sciences  
D.Phil., University of Oxford, England. Former affiliation: Program in Atmospheric and Oceanic Sciences (PAOS) and Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado.

### **James C. Moore, Crown College (1970)**

Professor Emeritus, Earth and Planetary Sciences  
B.A., University of California, Santa Barbara; Ph.D., Princeton University.

### **Jonathan W. Moore (2008)**

Assistant Professor, Ecology and Evolutionary Biology  
B.A., Carleton College; Ph.D., University of Washington. National Marine Fisheries Service, Seattle, Washington.

### **Madeline R. Moore, Kresge College (1972)**

Professor Emerita, English Literature  
B.S., Ph.D., University of Texas at Austin. Former affiliation: University of Texas at Austin.

### **Cynthia A. Mori (1983)**

Physical Education Instructor  
B.A., M.A., California State University, Long Beach. Former affiliation: Saddleback College.

### **Robin D. Morris (2008)**

Associate Adjunct Professor, Applied Mathematics and Statistics  
M.A., Cambridge University; Ph.D., Cambridge University. Universities Space Research Association.

### **Margaret E. Morse, Porter College (1991)**

Professor Emerita, Film and Digital Media  
B.A., Humboldt State University; M.A., Ph.D., University

## Teaching and Administrative Staff

of California, Berkeley. Former affiliations: San Francisco State University; University of San Francisco; University of Southern California.

### **Judit N. Moschkovich, Crown College (1999)**

Professor, Education

B.S., University of Minnesota; M.A., Ph.D., University of California, Berkeley. Former affiliations: Research scientist and project director, TORC, Cambridge, Massachusetts; research scientist and project director, Institute for Research on Learning, Menlo Park, California.

### **Eduardo Mosqueda, College Ten (2007)**

Assistant Professor, Education

B.A., University of California Irvine; Ed.M., Harvard Graduate School of Education; Ed.D., Harvard Graduate School of Education.

### **Peter H. Mostkoff, Porter College (1999)**

Assistant Professor, Theater Arts

B.A., Sarah Lawrence College; M.A., Ph.D. cand., University of California, Berkeley.

### **Gordon Mumma, Porter College (1973)**

Professor Emeritus, Music

Composer of electronic and instrumental music. Former affiliations: Cursos Latinoamericanos de Musica Contemporanea; Mills College; University of California, San Diego; Merce Cunningham Dance Company; Sonic Arts Union; University of Illinois.

### **Derek C. Murray (2007)**

Assistant Professor, History of Art and Visual Culture

B.F.A., Art Center College of Design; M.A., California State University Los Angeles; M.A., Cornell University; Ph.D., Cornell University. University of South Florida, University of California Berkeley.

### **Stephen D. Murray (2003)**

Associate Adjunct Professor, Astronomy and Astrophysics

B.S., Washington State University; M.S., Ph.D., University of California, Santa Cruz. Concurrent Affiliation: Concurrent affiliation: Lawrence Livermore National Laboratory.

### **John T. Musacchio (2004)**

Associate Professor, Information Systems Management

B.S., Ohio State University; M.S., Ph.D., University of California, Berkeley. Former affiliation: TerraBlaze, Inc.

### **Kim I. Musch (1998)**

Physical Education Instructor

A.B., University of California, Berkeley; M.A., San Jose State University. Former affiliations: University of California, Berkeley; Chabot College; Ohlone College.

### **Peggy B. Musgrave, Crown College (1980)**

Professor Emerita, Economics

B.A., M.A., American University; Ph.D., Johns Hopkins University. Former affiliations: Northeastern University; University of California, Berkeley; Vassar College.

### **Olga Najera Ramirez, Merrill College (1989)**

Professor, Anthropology

B.A., University of California, Santa Cruz; M.A., Ph.D., University of Texas at Austin.

### **Ravi K. Narasimhan (2004)**

Assistant Professor, Electrical Engineering

B.S., University of California, Berkeley; M.S., Ph.D., Stanford University. Former affiliations: Stanford University; Marvell Semiconductor.

### **Onuttom Narayan, College Eight (1995)**

Professor, Physics

M.Sc., Indian Institute of Technology; M.A., Ph.D., Princeton University. Former affiliation: Harvard University.

### **Michael Nauenberg, Crown College (1966)**

Professor Emeritus, Physics

B.S., Massachusetts Institute of Technology; Ph.D., Cornell University. Former affiliations: Columbia University; Stanford Linear Accelerator Center.

### **Paul Nauert, Porter College (1996)**

Professor, Music

B.M., Eastman School of Music; M.A., Ph.D., Columbia University.

### **Marta A. Navarro (1990)**

Lecturer, Spanish Language

B.A., M.A., University of California, Berkeley.

### **Jerry E. Nelson (1994)**

Professor Emeritus, Astronomy and Astrophysics;

Astronomer, UC Observatories/Lick Observatory

B.S., California Institute of Technology; Ph.D., University of California, Berkeley. Former affiliation: University of California, Berkeley.

### **Jerome Neu, Cowell College (1972)**

Professor, Humanities

## Teaching and Administrative Staff

B.A., Princeton University; D.Phil., Oxford University.

### **Dard A. Neuman, Porter College (2004)**

Assistant Professor, Music; Kamil and Talat Hasan Endowed Chair in Classical Indian Music  
B.A., University of Washington, Amherst; M.Phil., Ph.D., Columbia University. Former affiliation: Columbia University.

### **Andrew T. Newberry, Cowell College (1965)**

Professor Emeritus, Ecology and Evolutionary Biology  
B.A., Princeton University; Ph.D., Stanford University.

### **Ellen S. Newberry (1997)**

Lecturer, Writing  
B.A., Brown University; M.A., San Francisco State University. Former affiliations: De Anza College; Evergreen Valley College.

### **Jason A. Nielsen (2006)**

Associate Professor, Physics  
Ph.D., University of Wisconsin, 2001. Lawrence Berkeley National Laboratory.

### **Diana I. Nieves-Miranda (2002)**

Lecturer, Music  
B.A., M.A., University of California, Santa Cruz.

### **Walter H. Nimmo (2005)**

Professor, Earth and Planetary Sciences  
Ph.D., Cambridge University. Former affiliations: University College, London; University of California, Los Angeles.

### **Harry F. Noller, Crown College (1968)**

Research Professor, Molecular, Cell, and Developmental Biology  
B.A., University of California, Berkeley; Ph.D., University of Oregon. Former affiliations: Institut de Biologie Moleculaire (Geneva); MRC Laboratory of Molecular Biology (Cambridge, England).

### **Loisa C. Nygaard, Crown College (1975)**

Associate Professor, German Literature  
B.A., Ph.D., Cornell University.

### **Kysa Nygreen (2007)**

Assistant Professor, Education  
B.A., Barnard College; M.A., University of California Berkeley; Ph.D., University of California Berkeley. Former affiliations: University of California Berkeley.

### **Katia Obraczka (2001)**

Professor, Computer Engineering  
B.S., M.S., Federal University of Rio de Janeiro; M.S., Ph.D., University of Southern California. Former affiliation: University of Southern California.

### **Marcia Ochoa, Kresge College (2005)**

Associate Professor, Feminist Studies  
B.A., University of Michigan (Anthropology, Women's Studies); A.M., Stanford University (Cultural and Social Anthropology); Ph.D., Stanford University (Cultural and Social Anthropology). Former affiliation: Doctoral Candidate, Cultural and Social Anthropology, Stanford University.

### **James R. Oconnor, College Eight (1976)**

Professor Emeritus, Sociology  
B.S., Ph.D., Columbia University. Former affiliations: Barnard College; Washington University; San Jose State University.

### **Rodney T. Ogawa, College Ten (2002)**

Professor, Education  
B.A., University of California, Los Angeles; M.A., Occidental College; Ph.D., Ohio State University. Former affiliation: University of California, Riverside.

### **Matthew D. O'Hara, Cowell College (2006)**

Assistant Professor, History  
Ph.D., University of California, San Diego. Former affiliation: New Mexico State University.

### **Shigeko Okamoto (2008)**

Professor, Japanese Language  
B.A., Kyoto Prefectural University; M.A., California State University, Fresno; Ph.D., University of California, Berkeley. Concurrent Affiliation: California State University, Fresno.

### **Scott R. Oliver (2004)**

Professor, Chemistry and Biochemistry  
B.Sc., Ph.D., University of Toronto. Former affiliation: State University of New York at Binghamton.

### **Brad Olsen (2004)**

Professor, Education  
B.A., Bowdoin College; M.Ed., Harvard Graduate School of Education; Ph.D., University of California, Berkeley. Former affiliation: University of California, Los Angeles.

### **Gregory O'Malley (2008)**

Associate Professor, History  
B.A., Boston University; M.A., Ph.D., Johns Hopkins University.. California Institute of Technology..

## Teaching and Administrative Staff

### **Ryan D. Oprea (2006)**

Assistant Professor, Economics  
B.A., Hillsdale College; M.A., Ph.D., George Mason University.

### **Nicoletta Orlandi (2014)**

Assistant Professor, Philosophy  
B.A., University of Florence, Italy, M.A., Ph.D., University of North Carolina at Chapel Hill.

### **Charles L. Ortiz, Cowell College (1973)**

Professor Emeritus, Ecology and Evolutionary Biology  
B.A., California State University, Northridge; Ph.D., University of California, Los Angeles.

### **Paul A. Ortiz, College Ten (2001)**

Associate Professor, Community Studies  
B.A., Evergreen State College; Ph.D., Duke University.  
Former affiliation: Duke University.

### **Jane A. Orzel (1990)**

Lecturer, Music (Bassoon)  
B.S., Indiana University; M.A., San Jose State University.  
Concurrent affiliations: Santa Cruz County Symphony; Monterey County Symphony; Ensemble Monterey; Santa Cruz Chamber Players; Laurel Wind Quintet.  
Former affiliations: Hartnell College; University of Tulsa; Oral Roberts University.

### **Edward P. Osborn (2004)**

Assistant Professor, Art  
B.A., Wesleyan University; M.F.A., Mills College. Former affiliation: San Francisco Art Institute.

### **Donald E. Osterbrock, Crown College (1972)**

Professor Emeritus, Astronomy; Astronomer Emeritus, UC Observatories/Lick Observatory  
Ph.B., B.S., M.S., Ph.D., University of Chicago; (Hon.) D.Sc.: University of Cincinnati; University of Chicago; Ohio State University; University of Wisconsin-Madison.

### **Richard E. Otte, Cowell College (1982)**

Professor, Philosophy  
B.A., Colorado State University; M.A., Ph.D., University of Arizona. Former affiliation: University of Pittsburgh.

### **Karen M. Ottemann, Crown College (1998)**

Professor, Microbiology and Environmental Toxicology  
B.S., University of California, Davis; Ph.D., Harvard University. Former affiliation: University of California, Berkeley.

### **Michael M. Oye (2011)**

Assistant Adjunct Professor, Electrical Engineering  
B.S., University of California, Santa Barbara; M.S., Ph.D., University of Texas at Austin. Former affiliations: San Jose State University, University of California, Los Angeles.

### **Mesut Ozgen (1998)**

Lecturer, Music (Classical Guitar)  
M.M., Artist Diploma, Yale University, School of Music; D.M.A. cand., Arizona State University; M.D., Hacettepe University (Ankara, Turkey). Former affiliation: School of Music Education, Gazi University (Turkey).

### **Jaye Padgett, Stevenson College (1992)**

Professor, Linguistics  
B.A., University of Maryland; Ph.D., University of Massachusetts-Amherst.

### **Jeffrey D. Paduan (1997)**

Associate Adjunct Professor, Ocean Sciences  
B.S.E., University of Michigan, Ann Arbor; Ph.D., Oregon State University. Concurrent Affiliation: Concurrent affiliation: Naval Postgraduate School.. Former affiliation: Scripps Institution of Oceanography, University of California, San Diego.

### **Eric P. Palkovacs (2012)**

Assistant Professor, Ecology and Evolutionary Biology  
B.S., University of Michigan, Ann Arbor; M.S., Ph.D., Yale University. Former affiliation: Duke University.

### **Daniel Palleros, Cowell College (1986)**

Lecturer, Chemistry and Biochemistry  
M.S., Ph.D., University of Buenos Aires.

### **Annapurna D. Pandey (1990)**

Lecturer, Anthropology  
B.A., Utkal University (Orissa, India); M.A., Ph.D., Jawaharlal Nehru University (New Delhi, India).

### **Triloki N. Pandey, Crown College (1973)**

Professor, Anthropology  
B.A., M.A., Lucknow University (India); M.A., Cambridge University; Ph.D., University of Chicago. Former affiliations: Cambridge University; University of Pittsburgh; New York University.

### **Alex Pang, Merrill College (1990)**

Professor, Computer Science  
B.S., University of the Philippines; M.S., Ph.D., University of California, Los Angeles.

## Teaching and Administrative Staff

### **Ingrid M. Parker, College Nine (1998)**

Associate Professor, Ecology and Evolutionary Biology  
A.B., University of Chicago; Ph.D., University of  
Washington.

### **Ingrid M. Parker, College Nine (1998)**

Associate Professor, Ecology and Evolutionary Biology  
A.B., University of Chicago; Ph.D., University of  
Washington.

### **Jennifer A. Parker, Porter College (1999)**

Assistant Professor, Art  
B.A., University of California, Santa Barbara; M.F.A.,  
Rutgers University.

### **Sarah-Hope Parmeter, Merrill College (1985)**

Lecturer, Writing  
B.A., Mills College; M.A., University of California, Davis.

### **Carrie L. Partch (2011)**

Assistant Professor, Chemistry and Biochemistry  
B.S., University of Washington, Ph.D., University of  
North Carolina, Chapel Hill. Former affiliations:  
University of Washington; University of North Carolina,  
Chapel Hill; University of Texas Southwestern Medical  
Center.

### **Eleonora Pasotti, Merrill College (2003)**

Associate Professor, Politics  
M.Sc., London School of Economics; M.Phil., Ph.D.,  
Columbia University.

### **Adina Paytan (2008)**

Lecturer, IMS Research Scientist, Institute of Marine  
Sciences  
B.S., Hebrew University, Jerusalem; M.S., Weizmann  
Institute of Science, Rehovot; Ph.D., Scripps Institution  
of Oceanography. Former affiliations: University of  
California, San Diego.

### **Arthur Pearl, College Eight (1972)**

Professor Emeritus, Education  
B.A., M.A., Ph.D., University of California, Berkeley.  
Former affiliations: Howard University; University of  
Oregon.

### **Devon E. Pearse (2009)**

Adjunct Professor, Ecology and Evolutionary Biology;  
NOAA Fisheries Service SW Fisheries Science Ctr  
B.A., University of California, Santa Cruz; Ph.D.,  
University of Georgia. NOAA Southwest Fisheries  
Science Center.

### **John S. Pearse, College Eight (1971)**

Professor Emeritus, Ecology and Evolutionary Biology  
B.S., University of Chicago; Ph.D., Stanford University.  
Former affiliations: American University in Cairo;  
California Institute of Technology.

### **David A. Pease (2009)**

Assistant Adjunct Professor, Computer Engineering  
M.S. and Ph.D., University of California, Santa Cruz.

### **Lucinda Pease-Alvarez (1990)**

Professor, Education  
B.A., Willamette University; M.A., Ph.D., Stanford  
University. Former affiliations: Stanford University;  
University of Alabama.

### **Kenneth Pedrotti, Porter College (2000)**

Professor, Electrical Engineering  
B.S., M.S., University of California, Berkeley; Ph.D.,  
Stanford University. Former affiliation: Rockwell  
Science Center.

### **James E. Pepper, College Eight (1972)**

Professor Emeritus, Environmental Planning  
(Environmental Studies)  
B.S., B.Arch., Montana State University; M.L.A., M.C.P.,  
University of California, Berkeley. Former affiliation:  
California State Polytechnic College, Pomona.

### **Ariel A. Perez (2001)**

Lecturer, Spanish  
B.A., Universidad de Moron, Buenos Aires, Argentina;  
M.A., Monterey Institute of International Studies.  
Former affiliations: Defense Language Institute, Salinas  
Adult School.

### **Micah E. Perks, Kresge College (1997)**

Professor, Literature  
B.A., M.F.A., Cornell University. Former affiliations:  
Hobart and William Smith Colleges; Cornell University.

### **Hector Perla (2008)**

Assistant Professor, Latin American and Latino Studies  
B.A., San Francisco State University; M.A., Stanford  
University; Ph.D., University of California, Los Angeles..  
University of California, Irvine; Ohio University..

### **Thomas F. Pettigrew, Stevenson College (1979)**

Professor Emeritus, Social Psychology  
B.A., University of Virginia; M.A., Ph.D., Harvard  
University. Former affiliations: University of North  
Carolina; Harvard University.

## Teaching and Administrative Staff

### **Stacy M. Philpott (2012)**

Associate Professor and Alfred E. Heller Chair in Agroecology, Environmental Studies  
B.S., University of Washington; Ph.D., University of Michigan.. Former affiliations: University of Toledo; Smithsonian Institution, Migratory Bird Center..

### **Jarmila Pittermann (2008)**

Associate Professor, Ecology and Evolutionary Biology  
B.S., McMaster University, Canada; M.S., University of Toronto, Canada; Ph.D., University of Utah. University of California, Berkeley.

### **Juan E. Poblete, Merrill College (1997)**

Professor, Spanish Literature  
Licenciante, Universidad de Chile; Ph.D., Duke University.  
Former affiliation: Duke University.

### **Grant Pogson, Crown College (1994)**

Professor, Ecology and Evolutionary Biology  
B.Sc., Carleton University; Ph.D., University of British Columbia. Former affiliations: Dalhousie University (Canada); University of Cambridge (England).

### **Ira Pohl, Stevenson College (1970)**

Professor Emeritus, Computer Science  
B.A., Cornell University; M.S., Ph.D., Stanford University.  
Former affiliation: Thomas J. Watson Laboratory.

### **Larry Polansky (2013)**

Professor, Music  
B.A., University of California, Santa Cruz; M.A., University of Illinois, Champaign-Urbana. Mills College; Dartmouth College.

### **Cynthia L. Polecristi, Stevenson College (1988)**

Associate Professor, History  
B.A., University of Pittsburgh; M.A., Ph.D., University of California, Berkeley.

### **Neoklis Polyzotis (2003)**

Professor, Computer Science  
Diploma, University of Athens; M.Sc., Ph.D., University of Wisconsin.

### **Caroline M. Pomeroy (1998)**

Lecturer, Ocean Sciences  
Ph.D., Texas A&M University.

### **Clifton A. Poodry, Merrill College (1972)**

Professor Emeritus, Molecular, Cell, and Developmental Biology  
B.A., M.A., State University of New York at Buffalo; Ph.D.,

Case Western Reserve University.

### **Jennifer Poole, College Nine (2007)**

Assistant Professor, Economics  
Ph.D., (expected) University of California, San Diego;  
B.A., Smith College.

### **Eric C. Porter, Oakes College (2001)**

Professor, American Studies, History, and History of Consciousness  
B.A., University of California, Berkeley; M.A., Ph.D., University of Michigan. Former affiliation: University of New Mexico.

### **Donald C. Potts, Crown College (1977)**

Professor, Ecology and Evolutionary Biology  
B.Sc., University of Queensland; Ph.D., University of California, Santa Barbara. Former affiliations: Australian National University; Flinders University (Australia).

### **Nader Pourmand (2008)**

Associate Professor, Biomolecular Engineering;  
Director, UCSC Genomics Sequencing Center  
B.S., Stockholm University, Stockholm, Sweden; M.S., Ph.D., Karolinska Institute, Stockholm, Sweden.

### **Raquel Prado (2001)**

Professor, Applied Mathematics and Statistics  
B.S., Universidad Simon Bolivar (Caracas, Venezuela);  
M.S., Ph.D., Duke University. Former affiliation: Universidad Simon Bolivar.

### **Anthony R. Pratkanis, Stevenson College (1987)**

Professor, Psychology  
B.S., Eastern Mennonite College; M.A., Ph.D., Ohio State University. Former affiliation: Carnegie Mellon University.

### **Maria A. Prencipe, Cowell College (1991)**

Lecturer, Italian Language  
Laurea (M.A.), University of Bari (Italy).

### **Daniel M. Press, College Eight (1992)**

Professor, Environmental Studies  
B.S., University of California, Davis; M.A., Ph.D., Claremont Graduate School. Former affiliations: EPICS International; California Institute of Public Affairs.

### **Joel R. Primack, Crown College (1973)**

Professor, Physics  
B.A., Princeton University; Ph.D., Stanford University.  
Former affiliations: Stanford Linear Accelerator Center;

## Teaching and Administrative Staff

Harvard University.

### **Jason X. Prochaska (2002)**

Associate Professor, Astronomy and Astrophysics;  
Assistant Astronomer, UC Observatories/Lick Observa  
B.S., Princeton University; M.S., Ph.D., University of  
California, San Diego.

### **Stefano Profumo (2007)**

Associate Professor, Physics  
B.S., Università di Pisa; M.S., Scuola Normale Superiore,  
Pisa; Ph.D., International School for Advanced Studies  
(SISSA-ISAS), Trieste (Italy)..

### **Mary B. Pudup, College Eight (1989)**

Associate Professor, Social Sciences  
B.A., Pennsylvania State University; M.A., Ph.D.,  
University of California, Berkeley. Former affiliation:  
West Virginia University.

### **Geoffrey K. Pullum, Cowell College (1981)**

Professor Emeritus, Linguistics  
B.A., University of York; Ph.D., University of London.  
Former affiliations: University of York; University  
College London.

### **Jie Qing, Crown College (1997)**

Professor, Mathematics  
B.S., M.S., Peking University; Ph.D., University of  
California, Los Angeles. Former affiliation: Columbia  
University.

### **Ralph H. Quinn, Stevenson College (1984)**

Lecturer, Psychology  
A.B., Bowdoin College; M.A., Goddard College; Ph.D.,  
Saybrook Institute (San Francisco).

### **Sarah Rabkin (1985)**

Lecturer, Environmental Studies  
B.A., Harvard University; Graduate Certificate,  
University of California, Santa Cruz.

### **Hugh D. Raffles, College Nine (1998)**

Associate Professor, Anthropology  
B.A., University of Warwick; M.A., University of London;  
D.F.E.S., Yale University.

### **Peter T. Raimondi, College Eight (1996)**

Professor, Ecology and Evolutionary Biology  
B.A., Northern Arizona University; Ph.D., University of  
California, Santa Barbara. Former affiliation: University  
of Melbourne.

### **S R. Rajan, Cowell College (1997)**

Associate Professor, Environmental Studies  
B.A., Osmania University; B.A., M.A., M.Phil., University  
of Delhi; D.Phil., University of Oxford. Former  
affiliations: Max Planck Institute (Berlin); Cornell  
University; University of California, Berkeley;  
University of Oxford.

### **Amy Ralston (2009)**

Assistant Professor  
B.A., Oberlin College; Ph.D., University of Wisconsin,  
Madison. Hospital for Sick Children Research Institute,  
Toronto, Ontario.

### **Arthur P. Ramirez (2009)**

Professor, Electrical Engineering  
B.S., Ph.D., Yale University. Former affiliations: LGS; Bell  
Labs..

### **Catherine S. Ramirez, Oakes College (2002)**

Assistant Professor, Latin American and Latino Studies  
B.A., M.A., Ph.D., University of California, Berkeley.  
Former affiliation: University of New Mexico.

### **Frank A. Ramirez, Cowell College (1973)**

Lecturer, Spanish Language  
B.A., Hunter College, City University of New York; M.A.,  
Pennsylvania State University; Ph.D., University of  
California, Berkeley.

### **Renya K. Ramirez, Oakes College (2000)**

Associate Professor, American Studies  
B.A., University of California, Berkeley; M.A., Ph.D.,  
Stanford University.

### **Enrico J. Ramirez-Ruiz (2008)**

Professor, Astronomy and Astrophysics  
B.SC, Universidad Nacional Autonoma de Mexico; Ph.D.,  
University of Cambridge.

### **R R. Randolph, Cowell College (1965)**

Professor Emeritus, Anthropology  
B.A., Ph.D., University of California, Berkeley. Former  
affiliation: Rice University.

### **Paul Rangell, Porter College (1983)**

Lecturer, Art  
B.A., University of California, Santa Cruz; Tamarind  
Master Printer, Tamarind Institute, University of New  
Mexico.

### **David M. Rank, College Eight (1971)**

Professor Emeritus, Astronomy and Astrophysics

## Teaching and Administrative Staff

B.S., Pennsylvania State University; M.S., Ph.D., University of Michigan.

### **Tudor Ratiu, Crown College (1987)**

Professor Emeritus, Mathematics  
B.A., M.A., University of Timisoara (Romania); Ph.D., University of California, Berkeley. Former affiliation: University of Arizona.

### **Annalisa Rava (2003)**

Lecturer, Writing  
B.A., Wesleyan University; M.A., San Jose State University.

### **Ana C. Ravelo, Oakes College (1991)**

Professor, Ocean Sciences  
B.A., B.S., Stanford University; M.A., M.Phil., Ph.D., Columbia University.

### **Benjamin Read (2007)**

Associate Professor, Politics  
B.A., Cornell University; M.A., University of California Berkeley; Ph.D., Harvard University. University of Iowa.

### **Jennifer E. Reardon, College Eight (2005)**

Professor, Sociology  
B.S./B.A., University of Kansas (Biology/Political Science); M.A./Ph.D., Cornell University (Science and Technology Studies). Former affiliation: Harvard University; Brown University; Duke University.

### **Craig Reinerman, College Ten (1989)**

Professor, Sociology  
B.A., Babson College; M.A., San Francisco State University; Ph.D., University of California, Santa Barbara. Former affiliation: Northeastern University.

### **Jose Renau Ardevol (2004)**

Associate Professor, Computer Engineering  
B.S., M.S. Ramon Llull University; Ph.D., University of Illinois at Urbana Champaign.

### **Michael Rexach (2005)**

Professor, Molecular, Cell, and Developmental Biology  
B.S., Syracuse University; Ph.D., UC Berkeley; post-doctorate, Rockefeller University. Former affiliation: Stanford University.

### **B. R. Rich (2004)**

Professor, Social Documentation and Film and Digital Media  
B.A., Yale College. Former affiliation: University of California, Berkeley.

### **Alan R. Richards, Merrill College (1976)**

Professor, Emeritus, Environmental Studies  
A.B., A.M., Harvard University; M.A., Ph.D., University of Wisconsin-Madison. Former affiliations: Brooklyn College, City University of New York; University of Wisconsin.

### **Gerhard Ringel, Crown College (1967)**

Professor Emeritus, Mathematics  
Dr. rer. nat., University of Bonn; (Hon.) Dr. rer. pol. h. c., University of Karlsruhe. Former affiliations: University of Bonn; Johann Wolfgang von Goethe University (Frankfurt); Free University (Berlin).

### **Edward M. Riordan (1999)**

Adjunct Professor, Physics  
S.B., Ph.D., Massachusetts Institute of Technology. Concurrent Affiliation: Concurrent affiliations: Stanford University; Stanford Linear Accelerator Center.

### **Tonya Ritola (2014)**

Lecturer with Security of Employment, Writing Program  
B.A., Winthrop University; M.A., Appalachian State University; Ph.D., University of North Carolina. Former affiliation: Georgia Gwinnett College.

### **Steven Ritz (2009)**

Professor  
B.A., Wesleyan University, Middletown, CT; M.S., University of Wisconsin, Madison; Ph.D., University of Wisconsin, Madison. NASA Goddard Space Flight Center (GSFC).

### **Cecilia M. Rivas (2007)**

Professor, Latin American and Latino Studies  
Ph.D., Ethnic Studies, University of California, San Diego. Former affiliation: University of California, San Diego.

### **Forrest G. Robinson, Oakes College (1970)**

Professor, Humanities  
B.A., Northwestern University; M.A., Ph.D., Harvard University. Former affiliation: Harvard University.

### **Jonathan M. Robinson (2007)**

Associate Professor, Economics  
S.B., Massachusetts Institute of Technology; M.A., Princeton University; Ph.D., Princeton University.

### **Pamela A. Roby, Merrill College (1973)**

Emerita professor, Sociology  
B.A., University of Denver; M.A., Syracuse University; Ph.D., New York University. Former affiliations: George

## Teaching and Administrative Staff

Washington University; Brandeis University.

### **Constance M. Rockosi (2004)**

Professor/Astronomer, Astronomy and Astrophysics  
B.S.E., Princeton University; Ph.D., University of  
Chicago. Former affiliation: University of Washington,  
Seattle.

### **Abel Rodriguez (2007)**

Associate Professor, Applied Mathematics and Statistics  
B.A., M.S., Universidad Catolica Andres Bello, Venezuela;  
B.S., Universidad Simon Bolivar, Venezuela; M.A., Ph.D.,  
Duke University.

### **Lisa B. Rofel, Kresge College (1991)**

Professor, Anthropology  
B.A., Brown University; M.A., Ph.D., Stanford University.  
Former affiliation: Massachusetts Institute of  
Technology.

### **Barbara Rogoff, Porter College (1991)**

UC Santa Cruz Foundation Professor, Psychology  
B.A., Pomona College; Ph.D., Harvard University. Former  
affiliations: University of Utah; Center for Advanced  
Study in the Behavioral Sciences, Stanford University.

### **Carol A. Rohl (2003)**

Assistant Adjunct Professor, Biomolecular Engineering  
B.A. Rice University, Houston; Ph.D., Stanford  
University. Former affiliations: University of  
Washington; University of California, Berkeley.

### **Alvaro Romero (2000)**

Lecturer, Spanish Language  
Licenciatura, Universidad de Zaragoza (España); Ph.D.,  
Universidad Complutense de Madrid. Former affiliation:  
University of Madrid.

### **Elaine Y. Roos, Porter College (1973)**

Professor Emerita, Theater Arts (Costume Design)  
B.A., Pomona College; M.F.A., New York University  
School of the Arts. Former affiliation: State University of  
New York at Albany.

### **Norvid J. Roos, Porter College (1974)**

Professor Emeritus, Theater Arts (Design)  
B.F.A., University of Illinois; M.F.A., New York  
University. Former affiliations: The Electric Company,  
Children's Television Workshop; Metropolitan Opera;  
Illinois Wesleyan University.

### **Jasper A. Rose, Porter College (1965)**

Professor Emeritus, Art, History, and History of Art and

Visual Culture

B.A., M.A., Cambridge University. Former affiliations:  
Cambridge University; University of Keele (England);  
Rice University.

### **Patricia L. Rose, Oakes College (2002)**

Professor, American Studies  
B.A., Yale University; M.A., Ph.D., Brown University.  
Former affiliation: New York University.

### **Jacob Rosen (2008)**

Professor, Computer Engineering  
B.S., M.S., Ph.D., Tel Aviv University.. Former affiliation:  
University of Washington..

### **Bruce Rosenblum, Porter College (1966)**

Professor Emeritus, Physics  
B.S., New York University; Ph.D., Columbia University.  
Former affiliations: University of California, Berkeley;  
Radio Corporation of America.

### **Kevin G. Ross (2004)**

Assistant Professor, Information Systems Management  
B.S., University of Canterbury; M.S., Ph.D., Stanford  
University.

### **Tammi H. Rossman-Benjamin (1997)**

Lecturer, Hebrew Language  
B.A., McGill University; M.A., University of Pennsylvania.

### **Paul A. Roth, Cowell College (2004)**

Professor, Philosophy  
B.A., Wesleyan University; M.A., Ph.D., University of  
Chicago. Former affiliation: University of Missouri, St.  
Louis.

### **Wendy F. Rothwell (1998)**

Lecturer  
B.A., San Jose State University; B.S., San Jose State  
University; Ph.D., University of California, Santa Cruz..  
University of Santa Cruz MCD Biology Department..

### **Michael E. Rotkin, College Eight (1973)**

Lecturer, Community Studies  
B.A., Cornell University; Ph.D., University of California,  
Santa Cruz. Former affiliation: New York State School of  
Industrial and Labor Relations.

### **Seth M. Rubin (2006)**

Associate Professor, Chemistry and Biochemistry  
B.A., Columbia University; Ph.D. University of California,  
Berkeley..

## Teaching and Administrative Staff

### **Carollyn S. Rudesill (1984)**

B.A., Principia College; M.A., Middlebury College.  
Former affiliations: Harvard University; University of California Extension, Berkeley.

### **Danilyn Rutherford (2009)**

Professor, Anthropology  
Ph.D, Cornell University. University of Chicago.

### **Patrick M. Ryan (2003)**

Lecturer, Theater Arts  
B.F.A., Southern Methodist University; M.F.A., University of California, San Diego. Former affiliation: University of California, San Diego.

### **Warren Sack, Porter College (2002)**

Professor, Film and Digital Media  
B.A., Yale University; S.M., Ph.D., Massachusetts Institute of Technology. Former affiliations: University of California, Berkeley; Massachusetts Institute of Technology; University of Paris VIII.

### **John Sackett (1994)**

Lecturer, Music  
B.M., San Francisco Conservatory of Music; M.A., Mills College; M.A., Ph.D., University of California, Berkeley.

### **Hamid R. Sadjadpour (2001)**

Professor, Electrical Engineering  
B.S., M.S., Sharif University of Technology (Tehran);  
Ph.D., University of Southern California. Former affiliation: AT&T Research Laboratories (New Jersey).

### **Hartmut F. Sadrozinski, Crown College (1980)**

Adjunct Professor, Physics  
Dipl. Phys., University of Hamburg; Ph.D.,  
Massachusetts Institute of Technology. Former affiliation: Princeton University.

### **Guriqbal S. Sahota (2010)**

Assistant Professor, Literature  
B.A., University of California, Santa Cruz; M.A., Ph.D.,  
University of Chicago. Former affiliation: University of Minnesota, Twin Cities.

### **Chad W. Saltikov (2004)**

Professor, Environmental Toxicology  
B.S., University of California, Santa Barbara; Ph.D.,  
University of California, Irvine. Former affiliation:  
California Institute of Technology.

### **Jeremy R. Sanford (2008)**

Associate Professor  
B.A., biology and biochemistry, Case Western Reserve

University; Ph.D., molecular biology and microbiology,  
Case Western Reserve University. Indiana University  
School of Medicine.

### **Bruno Sanso (2002)**

Professor, Applied Mathematics and Statistics  
B.Sc., M.Sc., Universidad Simón Bolívar; Ph.D.,  
Universidad Central de Venezuela. Former affiliations:  
Duke University; Universidad Simón Bolívar.

### **Donald T. Saposnek, Stevenson College (1978)**

Lecturer, Psychology  
B.A., University of California, Los Angeles; M.A., San Jose  
State University; Ph.D., Ohio State University. Former  
affiliations: Institute of Juvenile Research (Chicago);  
University of San Francisco.

### **Bruce K. Sawhill (2012)**

Adjunct Assistant Professor, Computer Engineering  
Ph.D., Stanford University.

### **William M. Saxton (2007)**

Professor, Molecular, Cell, and Developmental Biology  
Ph.D., University of Colorado; M.S., California State  
University, Northridge; B.S., University of Minnesota.  
Indiana University, Bloomington.

### **John H. Schaar, Kresge College (1970)**

Professor Emeritus, Politics  
B.A., M.A., Ph.D., University of California, Los Angeles.  
Former affiliations: University of California, Los  
Angeles; Mount Holyoke College; University of  
California, Berkeley.

### **Felicity Schaeffer-Grabiell (2005)**

Associate Professor, Feminist Studies  
B.A., San Diego State University; M.A., University of  
Arizona; Ph.D., University of Minnesota, Minneapolis.  
Former affiliations: UC President's postdoctoral fellow;  
Latin American/Latino Studies, UCSC.

### **Terry L. Schalk (1975)**

Adjunct Professor, Physics  
B.S., Ph.D., Iowa State University. Former affiliations:  
University of California, Riverside; Stanford Linear  
Accelerator Center.

### **John M. Schechter, Merrill College (1985)**

Professor, Music; Provost, Merrill College  
A.B., Hamilton College; M.M., Indiana University; Ph.D.,  
University of Texas at Austin. Former affiliations: New  
England Conservatory of Music; Syracuse University.

## Teaching and Administrative Staff

### **Daniel Scheie, Kresge College (1987)**

Professor, Theater Arts (Drama)  
B.A., Indiana University at Bloomington; M.A., Ph.D.,  
University of California, Berkeley.

### **Martine Schlag, College Eight (1988)**

Professor, Computer Engineering  
B.A., M.S., Ph.D., University of California, Los Angeles.  
Former affiliation: University of Washington.

### **Stuart A. Schlegel, Merrill College (1968)**

Professor Emeritus, Anthropology  
B.A., University of California, Los Angeles; M.A., Ph.D.,  
University of Chicago. Former affiliation: University of  
Chicago.

### **Thomas W. Schleich, Crown College (1969)**

Professor Emeritus, Chemistry and Biochemistry  
B.S., Cornell University; Ph.D., Rockefeller University.

### **Zack Schlesinger, Cowell College (1995)**

Professor, Physics  
B.A., University of California, Santa Barbara; Ph.D.,  
Cornell University. Former affiliation: IBM Research-  
Yorktown Heights, New York.

### **Holger Schmidt (2001)**

Professor, Electrical Engineering  
B.S., University of Stuttgart; M.S., Ph.D., University of  
California, Santa Barbara.

### **Roger Schoenman, College Ten (2003)**

Associate Professor, Politics  
B.A., Johns Hopkins University; M.Sc., London School of  
Economics; Ph.D., Columbia University.

### **Maria Schonbek, Crown College (1986)**

Professor Emerita, Mathematics  
Licenciatura, University of Buenos Aires; Ph.D.,  
University of Michigan, Ann Arbor. Former affiliation:  
Duke University.

### **Bruce A. Schumm (1995)**

Professor, Physics  
B.A., Haverford College; Ph.D., University of Chicago.  
Former affiliation: Lawrence Berkeley National  
Laboratory.

### **Ronald J. Schusterman (1985)**

Adjunct Professor, Ocean Sciences  
B.A., Brooklyn College; M.A., Ph.D., Florida State  
University. Former affiliations: California State  
University, Hayward; Southern Oregon State University;

Columbia University; New York Aquarium for Wildlife  
Conservation.

### **Hilde L. Schwartz (1998)**

Senior Lecturer, Earth and Planetary Sciences  
B.A., University of California, Santa Barbara; Ph.D.,  
University of California, Santa Cruz. Former affiliation:  
Museum of Northern Arizona.

### **Susan Y. Schwartz, Cowell College (1989)**

Professor, Earth and Planetary Sciences  
B.S., Brown University; M.S., Ph.D., University of  
Michigan.

### **Thomas J. Schwarz (2005)**

Associate Adjunct Professor  
Ph.D., Computer Science and Engineering, University of  
California, San Diego. Former affiliation: Santa Clara  
University.

### **Judith A. Scott, Crown College (2000)**

Associate Professor, Education  
B.A., University of California, Davis; M.A., Ph.D.,  
University of Illinois, Urbana-Champaign. Former  
affiliation: Simon Fraser University.

### **Peter L. Scott, Stevenson College (1966)**

Professor Emeritus, Physics  
B.A., University of California, Berkeley; M.A., University  
of Michigan; Ph.D., University of California, Berkeley.  
Former affiliation: Stanford University.

### **William G. Scott, Crown College (1998)**

Professor, Chemistry and Biochemistry  
B.S., B.S., Bates College; Ph.D., University of California,  
Berkeley. Former affiliation: Indiana University.

### **Daniel D. Scripture, College Eight (1986)**

Lecturer Emeritus, Writing  
B.A., Goddard College; M.A., San Jose State University;  
Ph.D. cand., University of California, Santa Cruz. Former  
affiliation: San Jose State University.

### **Ana M. Seara, Merrill College (1998)**

Lecturer, Portuguese Language  
B.A., Universidade Federal do Rio de Janeiro; M.A., Ph.D.,  
University of North Carolina. Former affiliations:  
University of California, Berkeley; Stanford University.

### **Abraham Seiden, Crown College (1976)**

Professor, Physics; Director, Santa Cruz Institute for  
Particle Physics  
B.S., Columbia University; M.S., California Institute of

## Teaching and Administrative Staff

Technology; Ph.D., University of California, Santa Cruz.

### **Daniel Selden, Oakes College (1988)**

Professor, Classics (Literature)  
B.A., M.Phil., Ph.D., Yale University. Former affiliations:  
Barnard College; Columbia University; Yale University.

### **Vanita Seth, Merrill College (2001)**

Associate Professor, Politics  
B.A. (Hons., 1st class), University of Sydney; Ph.D.,  
University of Melbourne.

### **Travis L. Seymour, College Ten (2001)**

Associate Professor, Psychology  
B.A., Northwestern University; M.S., Ph.D., University of  
Michigan.

### **Scott A. Shaffer**

Lecturer, Ocean Sciences  
B.S., San Diego State University; M.S., Ph.D., University  
of California, Santa Cruz.

### **Juned M. Shaikh (2013)**

Assistant Professor, History  
B.A., University of Pune; M.A., University of Chicago;  
Ph.D., University of Washington. Former affiliations:  
Xavier University, Cincinnati; South Asia Council, Yale  
University.

### **Ali Shakouri, College Eight (1998)**

Professor, Electrical Engineering  
B.S., Ecole Nationale Supérieure des  
Telecommunications (Paris); M.S., Ph.D., California  
Institute of Technology. Former affiliation: University of  
California, Santa Barbara.

### **Beth A. Shapiro (2012)**

Associate Professor, Ecology and Environmental  
Biology  
B.S., M.S., University of Georgia; Ph.D., Oxford  
University. Former affiliation: Pennsylvania State  
University.

### **Helen Shapiro, College Nine (1997)**

Associate Professor, Sociology  
B.A., Hampshire College; M.A., M.Phil., Ph.D., Yale  
University. Former affiliation: Harvard Business School.

### **Buchanan Sharp, Stevenson College (1970)**

Professor, History  
B.A., University of California, Berkeley; M.A., University  
of Illinois; Ph.D., University of California, Berkeley.  
Former affiliation: University of California, Berkeley.

### **Sriram Shastry (2003)**

Professor, Physics  
B.Sc., Nagpur University (India); M.Sc., Indian Institute  
of Technology (Madras, India); Ph.D., Tata Institute of  
Fundamental Research (India). Former affiliation:  
Indian Institute of Science (Bangalore).

### **Carolyn M. Shaw, Kresge College (1972)**

Professor Emerita, Anthropology  
B.S., Ph.D., Michigan State University. Former  
affiliations: College of San Mateo; University of Nairobi.

### **Jerome M. Shaw, College Nine (2003)**

Assistant Professor, Education  
B.A., M.A., Ph.D., Stanford University. Former affiliation:  
Science for Linguistic Inclusion Project, WestEd.

### **Priscilla W. Shaw, Stevenson College (1967)**

Professor Emerita, English and Comparative Literature  
B.A., Swarthmore College; Ph.D., Yale University.  
Former affiliations: Haverford College; Rutgers  
University; Yale University.

### **Heather M. Shearer (2012)**

Associate Chair, Lecturer with Security of Employment  
Ph.D., Syracuse University.

### **Deanna Shemek, Cowell College (1990)**

Professor, Italian and Comparative Literature; Provost,  
Cowell College  
B.A., University of Nebraska; M.A., Ph.D., Johns Hopkins  
University. Former affiliations: Yale University;  
University of Pennsylvania.

### **Carol Shennan (1997)**

Professor, Environmental Studies  
B.A., Ph.D., University of Cambridge. Former affiliation:  
University of California, Davis.

### **Ajay Z. Shenoy (2014)**

Assistant Professor, Economics  
Ph.D., Rackham Graduate School, University of  
Michigan.

### **Robert J. Shepherd (1981)**

Senior Lecturer, Economics  
B.S., M.A., University of Southern California; California  
Certified Public Accountant. Former affiliation: Price  
Waterhouse & Co.

### **Alexander Sher (2008)**

Associate Professor, Physics

## Teaching and Administrative Staff

Diploma of Higher Education: Novosibirsk State University, Russia; Ph.D., University of Pittsburgh. SCIPP; Budker Institute of Nuclear Physics, Russia.

### **Cecilia J. Shin (2002)**

Physical Education Instructor, Scuba  
B.A., M.A., University of California, Santa Cruz.

### **William F. Shipley, Stevenson College (1966)**

Professor Emeritus, Linguistics  
B.A., Ph.D., University of California, Berkeley. Former affiliations: University of California, Berkeley; University of Novi Sad (Yugoslavia).

### **Nuria Silleras-Fernandez (2005)**

Lecturer, History  
Ph.D., University of Barcelona, Spain.

### **Eli A. Silver, Crown College (1973)**

Professor, Earth and Planetary Sciences  
B.A., University of California, Berkeley; Ph.D., Scripps Institution of Oceanography, University of California, San Diego. Former affiliations: U.S. Geological Survey; Scripps Institution of Oceanography.

### **Mary E. Silver, Oakes College (1972)**

Professor Emerita, Ocean Sciences  
B.A., University of California, Berkeley; Ph.D., Scripps Institution of Oceanography, University of California, San Diego. Former affiliation: San Francisco State College (Moss Landing Marine Laboratories).

### **Barry R. Sinervo (1997)**

Professor, Ecology and Evolutionary Biology  
B.S., Dalhousie University; Ph.D., University of Washington. Former affiliation: Indiana University.

### **Bakthan Singaram, Merrill College (1989)**

Professor, Chemistry and Biochemistry  
B.Sc., M.Sc., Ph.D., University of Madras (Tamil Nadu, India). Former affiliation: Purdue University.

### **Nirvikar Singh, Crown College (1982)**

Professor, Economics  
B.Sc., M.Sc., London School of Economics; Ph.D., University of California, Berkeley. Former affiliation: University of Delhi.

### **Marilou Sison-Mangus (2013)**

Assistant Professor, Ocean Sciences  
M.S., University of the Philippines; Ph.D., University of California, Irvine. Former affiliation: University of Basel, Switzerland.

### **Paul N. Skenazy, Kresge College (1971)**

Emeritus  
B.A., University of Chicago; M.A., Ph.D., Stanford University. Former affiliation: Stanford University.

### **Lisa Sloan, Crown College (1992)**

Professor, Earth and Planetary Sciences  
B.S., Allegheny College; M.S., Kent State University; Ph.D., Pennsylvania State University. Former affiliation: University of Michigan.

### **Greta N. Slobin, Stevenson College (1988)**

Russian Literature, Emerita  
B.A., Wayne State University; M.A., University of Michigan; M.Phil., Ph.D., Yale University. Former affiliations: Amherst College; State University of New York at Albany; Wesleyan University; University of Michigan; Yale University.

### **Bradley R. Smith (2006)**

Lecturer, Computer Engineering  
B.A., M.S., Ph.D., University of California, Santa Cruz.

### **David M. Smith (2003)**

Professor, Physics  
S.B., Massachusetts Institute of Technology; M.A., Ph.D., University of California, Berkeley. Former affiliation: University of California, Berkeley.

### **Donald R. Smith, Crown College (1996)**

Professor, Microbiology and Environmental Toxicology  
B.A., University of California, Santa Cruz; M.A., San Francisco State University (Moss Landing Marine Laboratories); Ph.D., University of California, Santa Cruz.

### **Graeme H. Smith, Merrill College (1989)**

Professor, Astronomy and Astrophysics; Astronomer, UC Observatories/Lick Observatory  
B.Sc., Ph.D., Australian National University. Former affiliations: Space Telescope Science Institute; Harvard-Smithsonian Center for Astrophysics; Dominion Astrophysical Observatory.

### **Ruth L. Solomon, Porter College (1970)**

Professor Emerita, Theater Arts (Dance)  
B.A., Bard College. Former affiliations: University of Hawaii; Punahou Academy; Indiana University; New York University School of the Arts; Chautauqua Institution.

### **Wayne J. Solomon (2000)**

## Teaching and Administrative Staff

### Lecturer, Music (Trombone)

B.M., University of Minnesota, Duluth; M.M., San Francisco Conservatory of Music. Concurrent affiliations: California State University, Fresno; Monterey County Symphony; Santa Cruz County Symphony; Napa Valley Symphony; Carmel Bach Festival. Former affiliation: America's Band in Blue (U.S. Air Force).

### **Soonho Song (1995)**

Physical Education Instructor

B.A., Yonsei University (Seoul); M.A., San Jose State University.

### **Michael Soule, College Eight (1989)**

Professor Emeritus, Environmental Studies

B.A., California State University, San Diego; M.A., Ph.D., Stanford University. Former affiliations: University of Michigan; University of California, San Diego.

### **Catherine M. Soussloff, Cowell College (1987)**

Professor Emerita, History of Art and Visual Culture (UC Presidential Chair)

A.B., Ph.D., Bryn Mawr College. Former affiliations: University of North Carolina at Chapel Hill; University of Connecticut.

### **Roswell L. Spafford, Kresge College (1978)**

Emerita

B.A., University of California, Santa Cruz; M.A., San Francisco State University. Former affiliation: San Francisco State University.

### **Alan C. Spearot (2007)**

Associate Professor, Economics

B.S., University of Michigan; M.S., University of Wisconsin; Ph.D., University of Wisconsin.

### **Melanie Springer (2013)**

Assistant Professor, Politics

B.A., University of California, San Diego; M.A., M.Philosophy, Ph.D., Columbia University. Former affiliation: Washington University, St. Louis.

### **Shelley Stamp, Porter College (1994)**

Professor, Film and Digital Media

B.A., University of Toronto; M.A., Ph.D., New York University. Former affiliation: Queen's University (Canada).

### **Audrey E. Stanley (1969)**

Professor Emerita, Theater Arts (Drama)

B.A., University of Bristol; M.A., Ph.D., University of

California, Berkeley. Former affiliations: University of Victoria (British Columbia); Dalhousie University; City of Birmingham College of Education; Nottinghamshire County College of Education; School of Art (Guildford, England).

### **Brian J. Staufienbiel, Porter College (1996)**

Lecturer, Music (Voice)

B.A., University of California, Santa Cruz; M.M., San Jose State University; D.M.A., Eastman School of Music. Former affiliations: Eastman School of Music; Santa Clara University.

### **Stuart P. Stegner, Porter College (1968)**

Professor Emeritus, American Literature

B.A., M.A., Ph.D., Stanford University. Former affiliation: Ohio State University.

### **Adriane Steinacker (2003)**

Lecturer, Astronomy and Astrophysics

Ph.D., Universitat Bonn, Germany. NASA Ames Research Center.

### **Andrea Steiner (1998)**

Lecturer, Community Studies

Ph.D., Rand Graduate School of Policy Studies; M.S., University of Southern California; A.B., Brown University. Concurrent Affiliation: Senior Lecturer in Gerontology & Health Policy, University of Southampton, UK (on leave since January 2001).

### **Elizabeth Stephens, Porter College (1994)**

Professor, Art

B.F.A., Tufts University; M.F.A., Rutgers University; Diploma, School of the Museum of Fine Arts, Boston.

### **Patricia L. Stoddart (1993)**

Professor, Education

B.A., University of Leeds (England); M.A., University of Birmingham (England); Ph.D., University of California, Berkeley. Former affiliations: Michigan State University; University of Utah.

### **Nancy E. Stoller, College Eight (1973)**

Emerita, Community Studies

B.A., Wellesley College; M.A., Ph.D., Brandeis University. Former affiliation: Emmanuel College.

### **Abraham D. Stone, Cowell College (2005)**

Associate Professor, Philosophy

A.B., Harvard University; M.A., Princeton University; Ph.D., Harvard University.. University of Chicago..

## Teaching and Administrative Staff

### **Michael D. Stone (2007)**

Associate Professor, Chemistry and Biochemistry  
B.A., University of Pennsylvania; Ph.D., University of California, Berkeley.

### **Victoria A. Stone (2008)**

Assistant Professor, Microbiology and Environmental Toxicology  
B.A., Cornell University; Ph.D., University of California, Berkeley.. Tufts University School of Medicine..

### **Benjamin C. Storm (2012)**

Assistant Professor, Psychology  
B.A., University of California, Santa Barbara; M.A., Ph.D., University of California, Los Angeles. Former affiliation: University of Illinois at Chicago.

### **Evelyn J. Strauss**

Lecturer in Science Writing  
B.S., University of California, Berkeley; Ph.D., University of California, San Francisco.

### **Susan Strome (2007)**

Professor, Molecular, Cell, and Developmental Biology  
Postdoctorate, University of Colorado; Ph.D., University of Washington; B.A., University of New Mexico. Indiana University, Bloomington.

### **Joshua M. Stuart, Cowell College (2003)**

Professor, Biomolecular Engineering; Associate Director, CBSE for Cancer and Stem Cell Genomics  
B.S., B.A., University of Colorado; Ph.D., Stanford University. Former affiliation: Stanford University.

### **Ellen G. Suckiel, Cowell College (1973)**

Emerita, Philosophy  
B.A., Douglass College; M.A., Ph.D., University of Wisconsin-Madison. Former affiliations: Florida State University; University of Wisconsin.

### **Toufic Suidan (2004)**

Assistant Professor  
B.S., California Institute of Technology; Ph.D., Princeton University. Former affiliations: Courant Institute of Mathematical Sciences, New York University; Institute for Advance Study.

### **Elaine A. Sullivan (2013)**

Assistant Professor, History  
B.A., Duke University; M.A., Ph.D., Johns Hopkins University. Former affiliations: University of California, Los Angeles.

### **William Sullivan, Crown College (1990)**

Professor, Molecular, Cell, and Developmental Biology  
B.A., University of California, San Diego; Ph.D., University of Washington. Former affiliation: University of California, San Francisco.

### **Undang Sumarna, Porter College (1976)**

Lecturer, Music (Gamelan)  
x. Former affiliations: Akademi Seni Tari Indonesia and Konservatori Karawitan (Bandung, West Java); University of California, Berkeley; University of California, Los Angeles.

### **David Swanger, Crown College (1971)**

Professor Emeritus, Education and Creative Writing  
B.A., Swarthmore College; M.A.T., Ed.D., Harvard University. Former affiliation: Harvard University.

### **David G. Sweet, Merrill College (1971)**

Professor Emeritus, History  
B.A., Oberlin College; M.A., Ph.D., University of Wisconsin-Madison.

### **Eugene Switkes, Crown College (1971)**

Professor Emeritus, Chemistry and Biochemistry  
B.A., Oberlin College; Ph.D., Harvard University. Former affiliations: Oberlin College; General Electric.

### **Marshall Sylvan, Stevenson College (1965)**

Lecturer Emeritus, Mathematics and Statistics  
B.S., Roosevelt University; M.S., University of Chicago; Ph.D., Stanford University.

### **Andrew Szasz, College Eight (1986)**

Professor, Sociology; Provost, College Eight  
B.A., Harvard University; M.A., University of Chicago; Ph.D., University of Wisconsin-Madison. Former affiliation: Rutgers University.

### **Neferti Tadiar, Oakes College (1996)**

Associate Professor, History of Consciousness  
B.A., University of the Philippines; M.A., University of Minnesota; Ph.D., Duke University. Former affiliation: University of the Philippines.

### **Jessica Taft (2014)**

Assistant Professor, Latin American and Latino Studies  
B.A., Macalester College; Ph.D., University of California, Santa Barbara. Former affiliation: Sonoma State University.

### **Lincoln Taiz (1973)**

Professor Emeritus, Molecular, Cell, and Developmental

## Teaching and Administrative Staff

### Biology

B.S., University of Utah; Ph.D., University of California, Berkeley. Former affiliation: University of California, Berkeley.

### **Dana Takagi, Stevenson College (1987)**

Professor, Sociology  
B.A., M.A., Ph.D., University of California, Berkeley.  
Former affiliation: University of California, Irvine.

### **Frank J. Talamantes, Oakes College (1974)**

Professor Emeritus, Molecular, Cell, and Developmental Biology  
B.A., University of St. Thomas; M.A., Sam Houston State University; Ph.D., University of California, Berkeley.

### **Heather Tallis (2014)**

Adjunct Professor, Environmental Studies  
B.S., Eckerd College; M.S., University of California, Santa Cruz; M.Sc., University of Otago, New Zealand; Ph.D., University of Washington. Former affiliation: The Nature Conservancy.

### **Hiroataka Tamanoi, Stevenson College (1996)**

Professor, Mathematics  
B.S., M.S., University of Tokyo; Ph.D., Johns Hopkins University. Former affiliations: Institut des Hautes Etudes; University of Kentucky; Max Planck Institut fur Mathematik; Rutgers University; Institute for Advanced Study (Princeton).

### **John W. Tamkun, Porter College (1989)**

Professor, Molecular, Cell, and Developmental Biology  
B.A., University of South Florida; Ph.D., Massachusetts Institute of Technology. Former affiliation: University of Colorado.

### **Wang-Chiew Tan (2002)**

Professor, Computer Science  
B.S., National University of Singapore; M.S., Ph.D., University of Pennsylvania.

### **Julie A. Tannenbaum (2001)**

Assistant Professor, Philosophy  
B.A., Ph.D., University of California, Los Angeles.

### **Robert M. Tanner (1971)**

Professor Emeritus, Computer Science  
B.S., M.S., Ph.D., Stanford University. Former affiliation: Tennessee State University.

### **Patrick Tantalo (1998)**

Lecturer, Computer Science

B.S., University of California, Berkeley; Ph.D., University of California, Santa Cruz. Former affiliation: University of Arkansas, Fayetteville.

### **Susan Tappero (2003)**

Lecturer, Mathematics  
B.A., California State University, Humboldt; M.A., Ph.D., University of California, Santa Cruz. Former affiliations: University of Northern Colorado; Middlebury College.

### **Kip T. Tellez, Stevenson College (2000)**

Professor, Education  
B.A., California State University, Fullerton; M.A., Ph.D., Claremont Graduate School. Former affiliation: University of Houston; Claremont Graduate School.

### **Balder David Ten Cate (2011)**

Associate Adjunct Professor, Computer Science  
Ph.D., University of Amsterdam.

### **Mircea S. Teodorescu (2011)**

Associate Adjunct Professor, Computer Engineering  
BSc, MSc, Politehnica University, Bucharest, Romania; Ph.D., Wayne State University, Detroit. Former affiliations: Cranfield University, United Kingdom; City University, London; Loughborough University, United Kingdom.

### **Richard Terdiman, Kresge College (1987)**

Professor Emeritus, Literature  
B.A., Amherst College; Ph.D., Yale University. Former affiliations: Swarthmore College; University of California, Berkeley; University of California, San Diego.

### **Susana Terrell (1993)**

Lecturer, Art  
B.A., Principia College; Graduate Certificate, University of California, Santa Cruz; M.A., San Francisco State University.

### **Bernie R. Tershy (2005)**

Adjunct Professor, Ecology and Evolutionary Biology  
B.S., University of California, Santa Cruz; M.S., Moss Landing Marine Laboratory; Ph.D., Cornell University. Former affiliation: Institute of Marine Sciences.

### **Roland G. Tharp, Crown College (1990)**

Professor Emeritus, Education and Psychology  
B.A., University of Houston; M.A., Ph.D., University of Michigan, Ann Arbor. Former affiliations: United States International University; University of Hawaii.

### **David J. Thomas, Stevenson College (1966)**

## Teaching and Administrative Staff

Professor Emeritus, Politics

B.A., Oberlin College; Ph.D., Harvard University.

### **Megan C. Thomas, Merrill College (2003)**

Assistant Professor, Politics

B.A., Oberlin College; M.S., London School of Economics;

Ph.D., Cornell University. Former affiliation:

Weatherhead East Asian Institute, Columbia University.

### **Ravi Thomas (2007)**

Adjunct Professor, Economics

M.S., London School of Economics; Ph.D., University of

California, Berkeley. Temple University, Swarthmore

College, International Monetary Fund.

### **Bruce A. Thompson, Stevenson College (1990)**

Lecturer, History

A.B., Princeton University; M.A., Ph.D., Stanford

University. Former affiliations: Stanford University;

Santa Clara University.

### **John N. Thompson, Stevenson College (2000)**

Professor, Ecology and Evolutionary Biology

B.A., Washington and Jefferson College; Ph.D.,

University of Illinois, Urbana-Champaign. Former

affiliation: Washington State University.

### **Avril Thorne, Stevenson College (1991)**

Professor, Psychology

B.A., University of Utah; M.A., Arizona State University;

Ph.D., University of California, Berkeley. Former

affiliations: University of California, Berkeley; Emory

University; Wellesley College.

### **Stephen E. Thorsett, Crown College (1999)**

Professor, Astronomy and Astrophysics; Interim Dean,

Division of Physical and Biological Sciences

B.A., Carleton College; M.A., Ph.D., Princeton University.

Former affiliation: Princeton University.

### **Martin T. Tinker (2009)**

Adjunct Professor, Ecology and Evolutionary Biology;

Western Ecological Research Center, USGS

B.S., University of Guelph, Ontario, Canada; M.S.,

University of Waterloo, Ontario, Canada; Ph.D.,

University of California, Santa Cruz. United States

Geological Survey, Western Ecological Research Center.

### **Othmar T. Tobisch, Porter College (1968)**

Professor Emeritus, Earth and Planetary Sciences

B.A., M.A., University of California, Berkeley; Ph.D.,

University of London (Imperial College). Former

affiliation: U.S. Geological Survey.

### **Judith A. Todd, Porter College (1984)**

Lecturer, Writing

B.A., Indiana University; M.L.S., University of California,

Berkeley; M.A., San Francisco State University; Ph.D.,

University of California, Santa Cruz.

### **Andrey N. Todorov, Porter College (1991)**

Professor, Mathematics

B.A., Ph.D., Moscow State University. Former affiliation:

Bulgarian Academy of Sciences.

### **Veronica K. Tonay (1989)**

Lecturer, Psychology

B.A., University of California, Santa Cruz; M.A., Ph.D.,

University of California, Berkeley.

### **Maziar Toosarvandani (2013)**

Assistant Professor, Linguistics

Ph.D., M.A., University of California, Berkeley; B.S.,

University of Virginia. Former affiliations: American

Council of Learned Societies, Massachusetts Institute of

Technology; University of California, Los Angeles.

### **Mark Traugott, Stevenson College (1974)**

Professor Emeritus, History

B.A., Harvard University; M.A., Ph.D., University of

California, Berkeley.

### **Nina K. Treadwell, Cowell College (2004)**

Assistant Professor, Music

B.A., B.M., University of Melbourne (Australia); M.A.,

Ph.D., University of Southern California. Former

affiliation: Grinnell College.

### **Jonathan Trent (2004)**

Adjunct Professor, Biomolecular Engineering

Ph.D., Scripps Institution of Oceanography. Concurrent

Affiliation: Concurrent affiliation: NASA Ames Research

Center.

### **Anthony J. Tromba, Cowell College (1970)**

Professor, Mathematics

B.S., Cornell University; M.A., Ph.D., Princeton

University. Former affiliation: Stanford University.

### **Anna L. Tsing, Kresge College (1987)**

Professor, Anthropology

B.A., Yale University; M.A., Ph.D., Stanford University.

Former affiliations: University of Colorado; University

of Massachusetts.

### **Slawomir M. Tulaczyk (2000)**

## Teaching and Administrative Staff

Professor, Earth and Planetary Sciences  
Magister, University of Wroclaw (Poland); Graduate  
Certificate, University des Saarlandes (Germany); M.Sc.,  
Northern Illinois University; M.Sc., Ph.D., California  
Institute of Technology. Former affiliation: University of  
Kentucky.

### **Zdravka Tzankova (2007)**

Assistant Professor, Environmental Studies  
A.B.D., University of California, Berkeley; M.A., Brown  
University; Ph.D., Mount Holyoke College.

### **Michael E. Urban, Stevenson College (1991)**

Professor Emeritus, Politics  
B.A., Seattle University; M.A., University of Alberta;  
Ph.D., University of Kansas. Former affiliations: Auburn  
University; State University of New York, College at  
Oswego; University of Montana.

### **Georges Y. Van Den Abbeele (2006)**

Professor, Literature; Humanities Dean  
B.A., Reed College; Ph.D., Cornell University.. Former  
affiliations: University of California, Santa Cruz; Miami  
University; University of California, Davis.

### **Allen Van Gelder, Porter College (1987)**

Professor, Computer Science  
B.S., Massachusetts Institute of Technology; Ph.D.,  
Stanford University.

### **Anujan M. Varma, College Eight (1991)**

Professor, Computer Engineering  
B.Sc., University of Calicut; M.E., Indian Institute of  
Science; Ph.D., University of Southern California.  
Former affiliation: IBM Thomas J. Watson Research  
Center.

### **Gustavo O. Vazquez, Porter College (1995)**

Associate Professor, Film and Digital Media  
B.F.A., San Francisco Art Institute; M.A., San Francisco  
State University. Former affiliations: Exploratorium;  
Telesistema Michoacano de Radio y Television;  
Guadalupe Cultural Arts Center.

### **John F. Vesecky, Crown College (1999)**

Professor, Electrical Engineering  
B.A., B.S., Rice University; M.S., Ph.D., Stanford  
University. Former affiliations: University of Michigan;  
Stanford University; University of Leicester (England);  
SRI International; Sylvania Electronic Defense  
Laboratories.

### **Thomas A. Vogler, Cowell College (1965)**

Professor Emeritus, English and Comparative  
Literature  
B.A., University of Chicago; M.A., Ph.D., Yale University.  
Former affiliation: Yale University.

### **Steven S. Vogt, Crown College (1978)**

Professor, Astronomy and Astrophysics; Astronomer,  
UC Observatories/Lick Observatory  
B.S., University of California, Berkeley; M.A., Ph.D.,  
University of Texas at Austin. Former affiliation:  
University of Texas at Austin.

### **Susan C. Vollmer (2002)**

Lecturer, Music (Horn)  
B.M., M.M., San Francisco Conservatory of Music.

### **George E. Vondermuhll, Merrill College (1969)**

Professor Emeritus, Politics  
B.A., Oberlin College; M.Sc., London School of  
Economics; Ph.D., Harvard University. Former  
affiliations: Swarthmore College; University of Chicago;  
Makerere University College (Uganda).

### **Matthew W. Wagers (2008)**

Associate Professor, Linguistics  
A.B., Princeton University; Ph.D., University of  
Maryland.

### **Marilyn A. Walker (2009)**

Professor, Computer Science  
B.A., University of California, Santa Cruz; M.S., Stanford  
University; M.A., Ph.D., University of Pennsylvania.  
Former affiliations: University of Sheffield, England;  
AT&T Labs, New Jersey; Mitsubishi Electric Research  
Laboratories, Cambridge, Massachusetts; Hewlett-  
Packard Laboratories, Bristol, England.

### **Carl E. Walsh, Crown College (1987)**

Professor, Economics  
B.A., Ph.D., University of California, Berkeley. Former  
affiliation: Princeton University.

### **Hongyun Wang (1999)**

Professor, Applied Mathematics and Statistics  
B.S., M.S., Beijing University; Ph.D., University of  
California, Berkeley. Former affiliation: Lawrence  
Berkeley National Laboratory.

### **Howard H. Wang, Stevenson College (1970)**

Professor Emeritus, Molecular, Cell, and Developmental  
Biology  
B.S., California Institute of Technology; Ph.D., University  
of California, Los Angeles. Former affiliations:

## Teaching and Administrative Staff

University of California, Berkeley; Massachusetts Institute of Technology.

### **Su-Hua Wang (2003)**

Associate Professor, Psychology  
B.S., M.S., National Taiwan University; Ph.D., University of Illinois, Urbana-Champaign.

### **Yiman Wang, Porter College (2006)**

Associate Professor, Film and Digital Media  
B.A., Nanjing University, China; M.A., Beijing University, China; Ph.D., Duke University. University of California, Los Angeles.

### **Zhu Wang**

Assistant Professor of MCD Biology  
B. S., Peking University; Ph.D., Columbia University; Postdoctorate, Columbia University Medical Center.

### **Edward C. Warburton, Porter College (2004)**

Associate Professor, Theater Arts  
B.A., Boston College; Ed.M., Ed.D., Harvard University. Former affiliations: New York University, Southern Methodist University, Boston Conservatory; Boston Ballet; Houston Ballet; American Ballet Theatr II.

### **Steven N. Ward (1984)**

Institute of Geophysics and Plantetary Physics (IGPP); Research Geophysicist  
B.S., Bucknell University; M.A., Ph.D., Princeton University. Former affiliation: Harvard University.

### **Noah Wardrip-Fruin (2008)**

Associate Professor, Computer Science  
B.A., University of Redlands; M.A., New York University; M.F.A., Ph.D., Brown University.. University of California, San Diego; University of Baltimore; New York University..

### **Manfred Warmuth, Stevenson College (1982)**

Professor, Computer Science  
Vordiplom in Informatik, Frederick Alexander Universitat (Germany); M.Sc., Ph.D., University of Colorado.

### **Michael J. Warren, Cowell College (1968)**

Professor Emeritus, English Literature  
B.A., M.A., Oxford University (Balliol College); M.A., Dalhousie University (Canada); Ph.D., University of California, Berkeley. Former affiliation: University of Victoria (British Columbia).

### **Richard A. Wasserstrom, Stevenson College (1979)**

Professor Emeritus, Philosophy  
B.A., Amherst College; M.A., Ph.D., University of Michigan; LL.B., Stanford University. Former affiliations: University of California, Los Angeles; Tuskegee Institute; U.S. Department of Justice; Stanford University.

### **Kerstin Wasson (2003)**

Assistant Adjunct Professor, Ecology and Evolutionary Biology  
B.A., Oberlin College; Ph.D., University of California, Santa Cruz. Concurrent Affiliation: Concurrent affiliation: Elkhorn Slough Foundation.

### **Lewis G. Watts, Porter College (2001)**

Professor Emeritus, Art  
B.A., M.A., University of California, Berkeley. Former affiliation: University of California, Berkeley.

### **Amy L. Weaver (1998)**

Lecturer, Writing  
B.A., University of California, Santa Cruz; M.A., Cornell University. Former affiliation: Cornell University.

### **Gerald E. Weber, Crown College (1983)**

Lecturer Emeritus, Earth and Planetary Sciences  
B.A., University of California, Riverside; M.A., University of Texas at Austin; Ph.D., University of California, Santa Cruz. Former affiliations: De Anza College; U.S. Geological Survey; Union Oil.

### **Martin Weissman (2006)**

Associate Professor, Mathematics  
Ph.D., Harvard University.

### **Jonathan Weitsman (1994)**

Professor, Mathematics  
S.B., S.B., Massachusetts Institute of Technology; Ph.D., Harvard University. Former affiliation: Columbia University.

### **David T. Wellman (1983)**

Professor Emeritus, Community Studies  
B.A., Wayne State University; M.A., Ph.D., University of California, Berkeley. Former affiliations: University of California, Berkeley; University of Oregon.

### **C. G. Wells, Porter College (2000)**

Professor Emeritus, Education  
B.A., University of Cambridge; Dipl. Appl. Ling., University of Edinburgh; Ph.D., University of Bristol. Former affiliations: Ontario Institute for Studies in Education, University of Toronto; University of Bristol.

## Teaching and Administrative Staff

### **Randall S. Wells (1983)**

Associate Adjunct Professor, Ocean Sciences  
B.A., University of South Florida; M.S., University of Florida; Ph.D., University of California, Santa Cruz.

### **Linda L. Werner, Porter College (1985)**

Adjunct Professor, Computer Science  
B.A., Clark University; M.S., Ph.D., University of California, San Diego. Former affiliations: Wang Laboratories; Data General Corporation.

### **Candace West, College Eight (1979)**

Professor, Sociology  
B.A., M.A., Ph.D., University of California, Santa Barbara. Former affiliations: University of California, Santa Barbara; Florida State University.

### **Marilyn J. Westerkamp, Merrill College (1989)**

Professor, History  
B.A., Brandeis University; M.A., Ph.D., University of Pennsylvania. Former affiliations: University of Wyoming; Clarion University of Pennsylvania.

### **Cedric J. Westphal (2009)**

Assistant Adjunct Professor, Computer Engineering  
M.S., Ecole Centrale, Paris, France; M.S., Ph.D., University of California, Los Angeles.

### **Donald L. Weygandt, Porter College (1967)**

Professor Emeritus, Art  
B.F.A., Washington University; M.F.A., University of Illinois. Former affiliations: University of Colorado; San Francisco Art Institute; University of California, Los Angeles.

### **Aaronette M. White (2008)**

Associate Professor  
A.B., University of Missouri-Columbia; M.A., Washington University; Ph.D., Washington University. Pennsylvania State University; Harvard University; Northwood University; Wilberforce University; University of Georgia; Missouri Institute of Mental Health; The University of the Western Cape (South Africa); St. Louis University; Washing University; Univ.

### **Hayden V. White, Oakes College (1978)**

University Professor Emeritus, History of Consciousness  
B.A., Wayne State University; M.A., Ph.D., University of Michigan. Former affiliations: Wesleyan University; University of California, Los Angeles; University of Rochester; Wayne State University.

### **Emmet J. Whitehead, Porter College (2000)**

Professor, Computer Science  
B.S., Rensselaer Polytechnic Institute; M.S., Ph.D., University of California, Irvine.

### **Stephen J. Whittaker (2011)**

Professor, Psychology  
B.A., University of Cambridge; Ph.D., St. Andrews University. University of Sheffield, United Kingdom; University of Edinburgh, United Kingdom; Stanford University; IBM; AT&T; Hewlett-Packard.

### **Paul Whitworth, Cowell College (1990)**

Professor Emeritus, Theater Arts  
M.A. (Hons., 1st class), University of St. Andrews; graduate studies, Oxford University. Former affiliation: Royal Shakespeare Company.

### **Donald M. Wiberg (2002)**

Professor Emeritus, Electrical Engineering  
B.S., M.S., Ph.D., California Institute of Technology. Former affiliations: Institute of Electrical and Electronics Engineers; University of California, Los Angeles.

### **Harold Widom, Stevenson College (1968)**

Professor Emeritus, Mathematics  
M.S., Ph.D., University of Chicago. Former affiliations: Cornell University; University of Chicago; University of California, Berkeley; Stanford University.

### **David A. Williams (1987)**

Adjunct Professor, Physics  
A.B., Washington University; A.M., Ph.D., Harvard University.

### **Quentin Williams, Porter College (1988)**

Professor, Earth and Planetary Sciences  
A.B., Princeton University; Ph.D., University of California, Berkeley.

### **Terrie M. Williams, College Eight (1994)**

Professor, Ecology and Evolutionary Biology; Ida Benson Lynn Professor, Ocean Health  
B.S., Douglass College; M.S., Ph.D., Rutgers University. Former affiliations: Scripps Institution of Oceanography; San Diego Zoo; Sea World Research Institute; Naval Oceans Systems Center Hawaii Laboratories; U.S. Office of Naval Research.

### **Stanley M. Williamson, Cowell College (1965)**

Professor Emeritus, Chemistry and Biochemistry

## Teaching and Administrative Staff

B.S., University of North Carolina; Ph.D., University of Washington. Former affiliations: University of California, Berkeley; Cambridge University.

### **Christopher C. Wilmers (2006)**

Associate Professor, Environmental Studies  
B.A., Wesleyan University; Ph.D., University of California, Berkeley.

### **George C. Wilson, College Nine (1972)**

Professor Emeritus, Community Studies  
B.A., Harvard University; M.A., Syracuse University.  
Former affiliations: Stanford University; Harvard University; Tufts University.

### **James A. Wilson, Cowell College (1985)**

Chair, Lecturer with Security of Employment, Writing  
B.A., California State University, Fresno; M.A., Ph.D., University of California, Berkeley. Former affiliation: University of California, Berkeley.

### **Margaret L. Wilson, Crown College (2001)**

Associate Professor, Psychology  
B.A., Reed College; Ph.D., University of California, Berkeley.

### **Robert J. Wilson, Oakes College (2001)**

Professor, Literature  
B.A., M.A., Ph.D., University of California, Berkeley.  
Former affiliation: University of Hawaii at Manoa.

### **Ronaldo V. Wilson (2013)**

Assistant Professor, Literature  
B.A., University of California, Berkeley; M.A., New York University; Ph.D., The City University of New York.  
Former affiliation: Mount Holyoke College.

### **William K. Winant (1983)**

Lecturer, Music (Percussion)  
B.F.A., York University; M.F.A., Mills College. Concurrent affiliations: University of California, Berkeley; Mills College; San Francisco Contemporary Music Players.  
Former affiliation: Mount Allison University.

### **Rasmus G. Winther (2007)**

Associate Professor, Philosophy  
B.A., Stanford University; M.A., Stanford University; Ph.D., Indiana University. Universidad Nacional Autónoma de Mexico (UNAM).

### **Will T. Wipke, Crown College (1975)**

Professor Emeritus, Chemistry and Biochemistry  
B.S., University of Missouri; Ph.D., University of

California, Berkeley. Former affiliations: University of Missouri; University of California, Berkeley; Harvard University; Princeton University.

### **Daniel J. Wirls, Merrill College (1988)**

Professor, Politics  
B.A., Haverford College; M.A., Ph.D., Cornell University.

### **Donald A. Wittman, Merrill College (1969)**

Professor, Economics  
B.A., University of Michigan; M.A., Ph.D., University of California, Berkeley. Former affiliations: University of Chicago; University of California, Berkeley.

### **Richard A. Wohlfeiler (1994)**

Lecturer, Art  
B.A., University of California, Los Angeles; Graduate Certificate, University of California, Santa Cruz.

### **Matthew J. Wolf-Meyer (2008)**

Associate Professor  
B.A., Oakland University; M.A., University of Liverpool; M.A., Bowling Green State University; Ph.D., University of Minnesota.. Wayne State University..

### **Greer E. Wolfson (2002)**

Lecturer, Music (Flute)  
B.M., Oberlin Conservatory of Music; M.M., University of Michigan, Ann Arbor.

### **Deborah Woo, College Eight (1984)**

Professor Emerita, Community Studies  
B.A., Tufts University; M.A., Ph.D., University of California, Berkeley.

### **Stanford E. Woosley, Crown College (1975)**

Professor, Astronomy and Astrophysics  
B.A., M.S., Ph.D., Rice University. Former affiliations: California Institute of Technology; Rice University; Lawrence Livermore National Laboratory.

### **Alexandra Z. Worden**

Adjunct Professor, Ocean Sciences  
B.A., Wellesley College; Ph.D., University of Georgia.  
Concurrent Affiliation: Monterey Bay Aquarium Research Institute. Massachusetts Institute of Technology.

### **Laura C. Wright (2013)**

Lecturer, Digital Arts and New Media  
BFA, School of Art Institute of Chicago; MFA, University of Washington; MFA, University of California, Santa Cruz.

## Teaching and Administrative Staff

### **Ru-Shan Wu (1986)**

Center for the Study of Imaging and Dynamics of the Earth (CSIDE) Research Geophysicist  
B.S., Northwestern University, China Ph.D.,  
Massachusetts Institute of Technology.

### **Thomas Y. Wu (2006)**

Assistant Professor, Economics  
Ph.D., Princeton University; M.A., B.A., Pontifical  
Catholic University of Rio de Janeiro. Former  
affiliations: Princeton University, Pontifical Catholic  
University of Rio de Janeiro.

### **Tatiani Xifara (2013)**

Visiting Assistant Professor, Applied Mathematics and  
Statistics  
Ptychion, M.Sc., University of Athens, Greece; Ph.D.,  
Lancaster University, United Kingdom.

### **David Yager (2009)**

Dean, Division of the Arts; Professor, Art Department  
(Design, Photography and Printmedia)  
H.D.D., DeMontfort University, U.K.; M.F.A., Florida State  
University; B.A., University of Connecticut.

### **Toshishige Yamada (2008)**

Associate Adjunct Professor, Electrical Engineering  
B.S., M.S., University of Tokyo; Ph.D., Arizona State  
University. Former affiliations: NASA Ames Research  
Center; Stanford University; Arizona State University..

### **Karen T. Yamashita, Kresge College (1997)**

Professor, Literature (Creative Writing)  
B.A., Carleton College. Former affiliation: University of  
California, Los Angeles.

### **Alice S. Yang, Merrill College (1993)**

Associate Professor, History  
B.A., Brown University; M.A., Ph.D., Stanford University.

### **Assaf M. Yasur-Landau (2007)**

Assistant Professor, History  
B.A., Tel Aviv University; M.A., Tel Aviv University;  
Ph.D., Tel Aviv University. Tel Aviv University.

### **Joel Yellin (1984)**

Professor, (Physical and Biological Sciences,  
Environmental Science)  
B.S., California Institute of Technology; M.S., Ph.D.,  
University of Chicago. Former affiliations:  
Massachusetts Institute of Technology; Lawrence  
Radiation Laboratory, University of California,

Berkeley; Institute for Advanced Study (Princeton).

### **Fitnat Yildiz, Crown College (2002)**

Associate Professor, Environmental Toxicology  
B.S., Hacettepe University (Ankara, Turkey); Ph.D.,  
Indiana University. Former affiliation: Carnegie  
Institution of Washington.

### **Hawa F. Yildiz, Crown College (2002)**

Associate Professor, Environmental Toxicology  
B.S., Hacettepe University (Ankara, Turkey); Ph.D.,  
Indiana University. Former affiliation: Carnegie  
Institution of Washington.

### **Christopher Yonge (2011)**

Lecturer, Digital Arts and New Media  
B.S. University of Edinburgh, United Kingdom; B.A.,  
Edinburgh College of Art, United Kingdom; M.A., North  
Carolina State University, Raleigh. Former affiliations:  
University of California, Santa Cruz, Computer Science  
Department; StudioCruz; MakersFactory; Sun  
Microsystems.

### **Allan P. Young, Crown College (1984)**

Professor, Physics  
M.A., D.Phil., Oxford University. Former affiliations:  
Oxford University; Institut Laue-Langevin (Grenoble,  
France); Cornell University; Imperial College (London).

### **Judith Yung, Oakes College (1990)**

Professor Emerita, American Studies  
B.A., San Francisco State College; M.L.S., Ph.D.,  
University of California, Berkeley. Former affiliations:  
University of California, Berkeley; Stanford University;  
San Francisco State University.

### **James C. Zachos, Crown College (1992)**

Professor, Earth and Planetary Sciences  
B.S., State University of New York, College at Oneonta;  
M.S., University of South Carolina; Ph.D., University of  
Rhode Island. Former affiliation: University of Michigan.

### **Alan M. Zahler (1994)**

Professor, Molecular, Cell, and Developmental Biology  
B.S., Carnegie Mellon University; Ph.D., University of  
Colorado, Boulder.

### **Jack Zajac, Porter College (1969)**

Professor Emeritus, Art  
F.A.A.R., American Academy in Rome. Former  
affiliations: University of Colorado; Artist-in-Residence,  
American Academy in Rome.

## Teaching and Administrative Staff

### **Erika S. Zavaleta, College Eight (2003)**

Professor, Environmental Studies  
B.A., M.A., Ph.D., Stanford University. Former affiliation:  
University of California, Berkeley.

### **Patricia J. Zavella, College Eight (1984)**

Professor, Latin American and Latino Studies  
B.A., Pitzer College; M.A., Ph.D., University of California,  
Berkeley.

### **Jonathan P. Zehr (1999)**

Professor, Ocean Sciences  
B.S., Western Washington University; Ph.D., University  
of California, Davis. Former affiliation: Rensselaer  
Polytechnic Institute.

### **Jin Z. Zhang, Crown College (1992)**

Professor, Chemistry and Biochemistry  
B.S., Fudan University (Shanghai); Ph.D., University of  
Washington. Former affiliation: University of California,  
Berkeley.

### **Yi Zhang, College Eight (2005)**

Associate Professor, Technology and Information  
Management  
B.S., Tsinghua University, China; MS., Ph.D., Carnegie  
Mellon University. Former affiliation: Carnegie Mellon  
University.

### **Xixi Zhao (1991)**

Lecturer, Earth and Planetary Sciences; CSIDE Research  
Geophysicist  
B.S., M.A., University of Science and Technology of

China; Ph.D., University of California, Santa Cruz.  
Former affiliation: Institute of Geology, Academia Sinica  
(Beijing).

### **Adrienne L. Zihlman, Oakes College (1967)**

Professor, Anthropology  
B.A., University of Colorado; Ph.D., University of  
California, Berkeley.

### **Martha C. Zuniga, Merrill College (1989)**

Professor, Molecular, Cell, and Developmental Biology  
B.A., University of Texas at Austin; M.Phil., Ph.D., Yale  
University. Former affiliation: University of Texas at  
Austin.

### **Yi Zuo (2007)**

Assistant Professor, Molecular, Cell, and Developmental  
Biology  
Postdoctorate, NYU School of Medicine; Postdoctorate,  
University of Texas; Ph.D., Northwestern University;  
B.S., Tsinghua University. University of Texas, Austin.

### **Eileen L. Zurbruggen, College Ten (2000)**

Professor, Psychology  
B.S., M.S., Michigan State University; M.A., Ph.D.,  
University of Michigan.

### **Eve C. Zyzik (2008)**

Associate Professor, Language Program  
B.A., Indiana University, Bloomington; Ph.D. University  
of California, Davis. Former affiliation: Michigan State  
University.

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## UNIVERSITY ADMINISTRATION

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The governance of the university is entrusted, under the state constitution, to the Regents of the University of California. The Board of Regents is presently composed of 18 members who are appointed by the governor of California, subject to California State Senate confirmation; seven members who participate because of the offices they hold; and a student member appointed by the board.

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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## THE REGENTS

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### EX OFFICIO REGENTS

Jerry Brown  
Governor of California

## Teaching and Administrative Staff

Gavin Newsom  
Lieutenant Governor  
Toni Atkins  
Speaker of the Assembly  
Tom Torlakson  
Superintendent of Public Instruction  
Janet Napolitano  
President of the University  
Sheldon Engelhorn  
President of the Alumni Associations  
of the University of California  
Karen Leong Clancy  
Vice President of the Alumni Associations  
of the University of California

### APPOINTED REGENTS

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(Term expires on March 1 of year indicated)

Richard C. Blum (2026)  
William De La Peña (2018)  
Gareth Elliott (2025)  
Russell Gould (2017)  
Eddie Island (2017)  
George Kieffer (2021)  
Sherry L. Lansing (2022)  
Monica Lozano (2022)  
Hadi Makarechian (2020)  
Eloy Ortiz Oakley (2024)

Norman J. Pattiz (2026)  
John A. Pérez (2024)  
Bonnie Reiss (2020)  
Frederick Ruiz (2016)  
Richard Sherman (2025)  
Bruce D. Varner (2018)  
Paul Wachter (2016)  
Charlene Zettel (2021)  
STUDENT REGENT

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Abraham "Avi" Oved (2015–16)  
UCLA

### OFFICERS OF THE REGENTS

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Jerry Brown  
President of the Board  
Sheryl L. Lansing  
Chairman of the Board  
Charles F. Robinson  
General Counsel and Vice President, Legal Affairs  
Anne Shaw  
Secretary and Chief of Staff  
Jagdeep Singh Bachher  
Chief Investment Officer and Vice President,  
Investments  
Sheryl Vacca  
Chief Compliance and Audit Officer

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## UNIVERSITY OFFICERS

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### **President**

Janet Napolitano

### **Provost and Executive Vice President—Academic and Health Affairs**

Aimée Dorr

### **Executive Vice President—Chief Financial Officer**

Nathan Brostrom

### **Vice President—Laboratory Management**

Kimberly S. Budil

### **Senior Vice President—Public Affairs**

Julie Henderson

### **Senior Vice President—Government Relations**

Nelson Peacock

### **Vice President—Agriculture and Natural Resources**

Glenda Humiston

### **Vice President—Student Affairs**

Judy K. Sakaki

### **Chancellors**

### **UC Berkeley**

Nicholas B. Dirks

### **UC Davis**

Linda P.B. Katehi

### **UC Irvine**

Howard Gillman

### **UCLA**

Gene D. Block

### **UC Merced**

Dorothy Leland

### **UC Riverside**

Kim A. Wilcox

### **UC San Diego**

Pradeep Khosla

### **UC San Francisco**

Sam Hawgood

### **UC Santa Barbara**

Henry T. Yang

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## UC SANTA CRUZ ADMINISTRATION

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**Chancellor**

George R. Blumenthal

**Campus Provost and Executive Vice Chancellor**

Alison Galloway

**Associate Chancellor**

Ashish Sahni

**Chief Campus Counsel**

Michael Troncoso

**Associate Campus Counsel**

Liv Hassett

**Vice Provost—Academic Affairs**

Herbert Lee

**Vice Provost and Dean—Graduate Studies**

Tyrus Miller

**Vice Provost and Dean—Undergraduate Education and Summer Session**

Richard Hughey

**Associate Vice Chancellor—Enrollment Management**

Michelle Whittingham

**Associate Vice Chancellor and Dean of Students**

Alma Sifuentes

**Assistant Vice Chancellor—Academic Personnel**

Pamela Peterson

**Vice Chancellor—Research and Principal Officer, Silicon Valley Initiatives**

Scott Brandt

**Associate Director—Silicon Valley Initiatives**

Tedd Siegel

**University Librarian**

M. Elizabeth Cowell

**Director, Office of Sponsored Projects**

Kate Aja

**Director, Office of Management of Intellectual Property**

Vanessa Tollefson

**Director, Office of Research Compliance**

Caitlin Deck

**Vice Chancellor—University Relations**

Keith Brant

**Associate Vice Chancellor—Strategic Philanthropy**

Jeff Shilling

**Assistant Vice Chancellor—Constituent Engagement**

Howard Heevner

**Assistant Vice Chancellor—Operations and Planning**

Elise Herrera-Mahoney

**Director, Marketing and Communications**

Lisa Nielsen

**Director, Government Relations**

Donna Blitzer

**Vice Chancellor—Planning and Budget**

Margaret Delaney

**Vice Chancellor—Business and Administrative Services**

Sarah Latham

**Associate Vice Chancellor—Colleges, Housing and Educational Services (CHES)**

Sue Matthews

**Associate Vice Chancellor—Physical Planning and Construction**

John Barnes

**Associate Vice Chancellor—Risk and Safety Services**

Jean Marie Scott

**Assistant Vice Chancellor—Financial Affairs**

Kirk L. Lew

**Interim Assistant Vice Chancellor—Staff Human Resources**

Lori Castro

**Vice Chancellor—Information Technology**

Mary M. Doyle

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### COLLEGE ADMINISTRATIVE OFFICERS

---

Deana Slater, Colleges Nine and Ten

Carolyn Golz, Cowell and Stevenson Colleges

Alex Belisario, Crown and Merrill Colleges

Susan Welte, Oakes College and College Eight

Michael Yamauchi-Gleason, Porter and Kresge Colleges

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## THE UC SANTA CRUZ FOUNDATION

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The UC Santa Cruz Foundation is a nonprofit, public benefit corporation formed in 1974 to promote greater understanding of UC Santa Cruz and to encourage and

accept gifts in support of academic programs, scholarships, fellowships, and capital improvements.

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### 2015-16 BOARD OF TRUSTEES

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#### OFFICERS

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**Mary E. Doyle (Porter '74)**

President

VP of Legal, Global Chief Compliance and Ethics Officer,  
Oracle  
Woodside

**Paul J. Hall (Merrill '72)**

Past-President

Partner, DLA Piper, LLP  
Kentfield

**Linda Peterson (Stevenson '70)**

Vice President, Development

Associate General Counsel, Occidental Petroleum  
Los Angeles

**Richard F. Moss (Stevenson '85)**

Parliamentarian

President, The Moss Group  
Los Angeles

#### ELECTED TRUSTEES

---

**Brandon Allgood (M.S., Ph.D., Physics, UCSC)**

Co-Founder/CTO, Numerate, Inc  
San Bruno

**Ricky N. Bluthenthal (Merrill '86)**

Professor of Preventative Medicine, USC Keck School of  
Medicine  
Los Angeles

**Stephen A. Bruce (Cowell '79)**

Managing Partner, Bruce Trust  
Calabasas

**Laura I. Bushnell**

Partner, King & Spalding LLP  
Palo Alto

**Barbara W. Canfield**

Community Volunteer  
Santa Cruz

**Henry D. Chu (Crown, '72)**

Pathologist  
Denver, Colorado

**Stephen J. Crowe**

Retired Vice Present of Finance and CFO, Chevron  
Corporation  
Danville

**Ken Doctor (Merrill '71)**

Founder, Content Bridges  
Santa Cruz

**David Doshay (M.S., Physics '82)**

Saratoga

**Lewis G. Feldman (College Eight, '78)**

Partner and Los Angeles Chair, Goodwin Procter LLP  
Los Angeles

**Theodore C. Goldstein (Oakes & Stevenson '83)**

Formerly Vice President of Development Technologies  
at Apple Computer  
Los Altos

**Ron Gonzales (Kresge, '73)**

President and CEO, Hispanic Foundation of Silicon  
Valley  
San Jose

**Michael P. Graydon (Cowell '70)**

Retired Administrator  
Pasadena

**Stephanie D. Harkness**

Former Chairman and CEO, Pacific Plastics  
Santa Cruz

**Kamil H. Hasan**

General Partner, HiTek Venture Partners  
Saratoga

**Robert Holo (Crown, '87)**

Partner, Simpson Thacher & Bartlett LLP  
New York City

**Matthew J. Howard (Crown '85)**

Senior Vice President, Bank of America Global Wealth  
Management  
Santa Cruz

**Peder Jones (Stevenson, '70)**

Founder and Consultant, Straight Line Editorial  
Development Inc.  
San Francisco

**Narinder S. Kapany**

Retired, Director of Research and Development, K2  
Optronics  
Woodside

**Loren L. Kinczel**

Managing Director, Scharf Investments  
Los Gatos

Teaching and Administrative Staff

**David Korduner (Merrill, '85)**

Associate National Executive Director/Senior General Counsel  
Directors Guild of America, Inc.  
Los Angeles

**Frans M. Lanting (Postgrad Research, Environmental Studies, '78-'79)**

Nature Photographer and Author  
Santa Cruz

**Anuradha Luther Maitra**

CEO, Floreat, Inc.  
Saratoga

**Kumar Malavalli**

Chief Strategy Officer  
InMage Systems  
Los Altos

**Kiran Malhotra**

Nutritionist and Arts Advocate  
Saratoga

**Kristen Marinovic (Graduate Studies '91)**

Financial Advisor, Integral Investment Advisors  
Santa Cruz

**SB Master (Cowell '75)**

President and Founder, Master-McNeil, Inc.  
Berkeley

**James Panetta**

Deputy District Attorney, Monterey County  
Oakland

**Vikram Sahai (M.S. Computer Engineering, '92)**

Software Engineer, Google  
Mountain View

**Garry A. Spire (Stevenson '77)**

Co-founder and General Counsel,  
Venture Technologies Group, LLC  
Pacific Palisades

**Loren A. Steck (Porter '73)**

CEO, Loren Steck & Associates  
Carmel

**Art Torres (Stevenson, '68)**

Vice Chair, Governing Board, California Institute for  
Regenerative Medicine  
San Francisco

**Alec J. Webster (College Eight, '02)**

Bonny Doon

**John M. Woodward (Cowell, 74)**

CEO, Front Porch Communities  
Glendale

**EX-OFFICIO TRUSTEES**

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**George Blumenthal**

UCSC Chancellor

**Donna Mekis**

Alumni Association President

Revised: 09/01/15

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# NONDISCRIMINATION AND AFFIRMATIVE ACTION POLICIES

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2015-16 General Catalog

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## STUDENT-RELATED MATTERS

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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 identity, pregnancy, physical or mental disability, medical condition (cancer related or genetic characteristics), 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. University policy also prohibits retaliation for bringing a complaint of discrimination or participating a complaint process or investigation pursuant to this policy.

Inquiries regarding the University's student-related nondiscrimination policies may be directed to Conduct and Community Standards, (831) 459-1738, or e-mail [conduct@ucsc.edu](mailto: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 the Office for Diversity, Equity, and Inclusion, (831) 459-3676 or e-mail [cbene@ucsc.edu](mailto:cbene@ucsc.edu).

Inquiries regarding UCSC's Policy on Sexual Assault, the UC Policy on Sexual Harassment and Procedures for Reports of Sexual Assault(s) and Sexual Harassment and/or violations of Title IX may be directed to Title IX Coordinator/Sexual Harassment Officer Tracey Tsugawa, (831) 459-2462, or e-mail [ttsugawa@ucsc.edu](mailto:ttsugawa@ucsc.edu).

Student inquiries regarding disability or disability accommodations may be addressed to the Director, Disability Resource Center, (831) 459-2089; or e-mail [drc@ucsc.edu](mailto: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 e-mail [ashish@ucsc.edu](mailto:ashish@ucsc.edu).

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## EMPLOYMENT-RELATED MATTERS

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The University of California prohibits discrimination against or harassment of any person employed by or seeking employment with the University on the basis of race, color, national origin, religion, sex, gender, gender expression, gender identity, pregnancy<sup>1</sup>, physical or mental disability, medical condition (cancer-related or genetic characteristics), genetic information (including family medical history), ancestry, marital status, age, sexual orientation, citizenship, status as a protected veteran or service in the uniformed services<sup>2</sup>.

University policy prohibits retaliation against any employee or person seeking employment for bringing a complaint of discrimination or harassment. University 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.

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. 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 nondiscrimination policies for academic, staff and student employment may be directed to the Office for Diversity, Equity, and Inclusion, (831) 459-3676, or e-mail [cbene@ucsc.edu](mailto:cbene@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.

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## SEXUAL HARASSMENT/TITLE IX

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The university cherishes the free and open exchange of ideas and expansion of knowledge. To maintain 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 its community from sexual and other forms of harassment. Students, faculty,

and staff who want information, advice, to file a complaint, and/or copies of the UCSC Policy on Sexual Assault, the UC Policy on Sexual Harassment, and Procedures for Reports of Sexual Assault(s) and Sexual Harassment should contact Tracey Tsugawa, Title IX/Sexual Harassment Officer, 105 Clark Kerr Hall, (831) 459-2462 or via e-mail at [ttsugawa@ucsc.edu](mailto:ttsugawa@ucsc.edu). For detailed information about the services of the Title IX/Sexual Harassment Office, visit the web site at [www2.ucsc.edu/title9-sh/](http://www2.ucsc.edu/title9-sh/). The Title IX/SHO is also available to investigate other violations of Title IX.

Revised: 09/01/15

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# APPENDIXES

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2015-16 General Catalog

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## APPENDIX A: CALIFORNIA RESIDENCY AND NONRESIDENT SUPPLEMENTAL TUITION

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The University of California (UC) 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 [UC Residence Policy and Guidelines here](#).

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, and for schools on the semester system, the day instruction begins for the semester.

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### REGULATIONS GOVERNING RESIDENCE

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The determination of residence for tuition purposes at the University of California is governed by the [UC Residence Policy and Guidelines](#) established by the UC Regents, and implemented by the UC President in consultation with the UC General Counsel.

Under the UC Residence Policy and Guidelines, adult citizens and certain immigrants and nonimmigrants can establish residence for tuition purposes. The presumption of residence deputies is that students and their parents have read and understand the UC residence requirements prior to submitting their residence information for determination of residence for tuition purposes. Decisions on residence status are made after a student accepts an offer of admission to the university by submitting a Statement of Intent to Register and completes a Statement of Legal Residence.

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### WHO IS A RESIDENT?

---

If you are an adult student (at least 18 years of age), you may establish residence in California if

- (1) You are a U.S. citizen.
- (2) You are a permanent resident or other immigrant.
- (3) You are a nonimmigrant who is not precluded from establishing a domicile in the U.S. This includes

nonimmigrants who hold valid visas of the following types: A, E, G, H-1B, H-4, I, K, L, N, O-1, O-3, R, T, U, or V. To establish residence you must be physically present in California for more than one year, and you must come here with the intent to make California your home as opposed to coming to this state to go to school. Physical presence within the state solely for educational purposes does not constitute the establishment of California residency, regardless of the length of stay. You must demonstrate your intention to make California your home by severing your residential ties with your former state of residence and establishing those ties with California. If your parents are not California residents, you are required to be financially independent in order to be a resident for tuition purposes. Your residence cannot be derived from your spouse, a registered domestic partner or a parent.

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### UC RESIDENCE AND POLICY GUIDELINES

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Information on the following topics can be found at [UC Residence and Policy Guidelines](#):

- Establishing intent for California residency, page 14
- Requirements for financial independence, page 17
- Temporary absences, page 21
- General rules applying to minors, page 22
- Exemptions from nonresident supplemental tuition, page 45

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### PETITIONING FOR CHANGE OF CLASSIFICATION

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You must petition in person at the Office of the Registrar for a change of classification from nonresident to resident status. Petitions must be initiated during the filing period for the term for which you intend to be classified as a resident. Late petitions will not be accepted.

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### TIME LIMITATION ON PROVIDING DOCUMENTATION

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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.

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## 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.

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## INQUIRIES AND APPEALS

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### Inquiries

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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\\_fees@ucsc.edu](mailto:reg_fees@ucsc.edu), or to the Residence Specialist, University of California Office of the General Counsel, 1111 Franklin Street, 8th Floor, Oakland, CA 94607-5200, or e-mail [residency.appeal@ucop.edu](mailto:residency.appeal@ucop.edu).

### Appeals

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Students denied resident status might have the right to appeal. Appeals must be filed within 30 days of notification of the campus residence deputy's decision.

[Instructions and Application to Appeal a Nonresident Classification](#)

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## RESIDENCY DISCLAIMER

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This is only a summary of the UC Residence Regulations and is not a complete explanation of the law 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.**

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## PRIVACY NOTICE

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All of the information requested on the Statement of Legal Residence form is required [by the authority of Standing Order 110.2 (a)–(d) of the Regents of the University of California] 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 95064-107

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## APPENDIX B: UC SANTA CRUZ POLICE DEPARTMENT

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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](http://police.ucsc.edu).

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### REPORTING PROCEDURES

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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, 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.

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### PHONE NUMBERS TO CALL

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- 9-1-1 for any emergency situation with serious threat to life or property.

## Appendixes

- (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) 459-2100: Campus Night Safety Escort Program Dispatch Line, 8:30 p.m. to 12:15 a.m., Monday through Thursday when classes are in session (except Summer Session).
- (831) 459-3TIP or (831) 459-3847: Anonymous Tip Line.

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### LOST AND FOUND

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The UC Santa Cruz Police Department is also responsible for the campus Lost and Found service. To drop off a found item or to inquire about a lost item, please visit the Police Department or call (831) 459-2231.

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### PARKING ENFORCEMENT

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The Parking Enforcement Office (for paying parking citations and requesting special parking consideration) is located at the Police Department. Citation payments may be made online at [Paymycite.com](http://Paymycite.com) 24 hours a day, or in person during business hours.

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### COMMUNITY SAFETY PROGRAM

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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.

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### JEANNE CLERY DISCLOSURE OF CAMPUS SECURITY AND CAMPUS CRIME STATISTICS ACT

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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: [clerycenter.org](http://clerycenter.org).

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### CAMPUS SECURITY AUTHORITIES

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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 web page](#).

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### ANNUAL CAMPUS SECURITY AND FIRE SAFETY REPORT

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On October 1 of each year, an e-mail notification is sent to all enrolled students and to academic and staff personnel, providing the web site 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

## Appendixes

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 web site](#).

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 web site](#).

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### CONSEQUENCES FOR NON-COMPLIANCE WITH THE CLERY ACT

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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.

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### INCREASED SAFETY MEASURES AND SAFEGUARDS

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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:

- Campus Night Safety Escort Program
- Fire system upgrades
- Environmental Health and Safety safeguards and improvements
- UC Santa Cruz Arts Division safety improvements

These programs and safeguards are detailed in [Increased Safety Measures and Safeguards](#).

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## APPENDIX C: DRUG-FREE SCHOOLS AND COMMUNITIES ACT

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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 e-mail. 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 conducted by the Dean of Students Office. For information, e-mail [deanofstudents@ucsc.edu](mailto:deanofstudents@ucsc.edu).

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## APPENDIX D: SMOKING ON CAMPUS POLICY

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**The University of California is tobacco-free at all campus locations system-wide.** Use of all forms of tobacco, including smokeless tobacco products and unregulated nicotine products (e.g., "e-cigarettes"), is strictly prohibited in **all** indoor **and** outdoor spaces

including parking lots. Tobacco users are supported in accessing a variety of free and low-cost tobacco-cessation services. For more detailed information about the policy, help quitting, and other resources see the UCSC [Smoke and Tobacco-Free web site](#).

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## APPENDIX E: POLICIES AND REGULATIONS

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The Student Policies and Regulations Handbook, the Code of Student Conduct, and related appendixes [may be accessed online](#). The Student Policies and Regulations Handbook is also available in alternate formats such as enlarged print, braille, audiocassette, or

electronic disc from Student Judicial Affairs. Topics include:

- Policy on Nondiscrimination
- Policy on Speech and Advocacy
- Policy on Use of University Properties
- Policy on Campus Emergencies

## Appendixes

- Registered Campus Organizations
- University Obligations and Student Rights
- Policy on Student Governments
- Policy on Campus-Based Student Fees
- Code of Student Conduct
- Policy on Student Grievance Procedures
- Policy on Student Participation in Governance
- Policies Applying to the Disclosure of Information from Student Records
- Guidelines Applying to Nondiscrimination on the Basis of Disability
- University of California Authorized Student Governments
- Use of the University's Name
- Nondiscrimination Policy Statement for University of California Publications Regarding Student-Related Matters
- UCSC Alcohol and Drug Policy
- University of California Policy on Hazing
- Policy on Sexual Harrassment for Undergraduates
- UCSC Academic Dishonesty Policy
- UCSC Policy on Sexual Orientation Harassment/Discrimination
- UCSC Guidelines for Speakers and Public Events for Students and Campus Organizations
- UCSC Computer Guidelines: Policies for Use of UCSC Computing Facilities
- UCSC Smoking Policy
- UCSC Public Nudity and Sexually Offensive Conduct Policy
- UCSC Hate/Bias Incident Policy
- UCSC Procedures for Ensuring Adequate Interim Protection from Retaliation or Intimidation for Complainant(s), Witness(es), and other Individuals
- UCSC Policy on Academic Integrity for Graduate Students

For further information, please contact [conduct@ucsc.edu](mailto:conduct@ucsc.edu).

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## APPENDIX F: GRADUATE STUDENT–FACULTY ADVISER RELATIONSHIP GUIDELINES

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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](#).) 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, the ombudsman, and/or counseling and psychological services. 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](#). For a description of additional informal and formal grievance and appeal

processes available to UCSC graduate students, please refer to the [Graduate Student Handbook](#).

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## APPENDIX G: STUDENT CONDUCT AND COMMUNITY STANDARDS

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The Student Conduct and Community Standards Office is responsible for the adjudication of all 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 local community. Allegations may be made by submitting a

report at the [Conduct and Community Standards web page](#).

Student Conduct and Community Standards serves as the complaint resolution office for grievances of alleged discrimination per the [Student Grievance Policy](#).

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 e-mail at [conduct@ucsc.edu](mailto:conduct@ucsc.edu), or [on the Web](#).

Revised: 09/01/15

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# INCREASED SAFETY MEASURES AND SAFEGUARDS

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UC Santa Cruz Campus  
May 2015

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.

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## CAMPUS NIGHT SAFETY ESCORT PROGRAM

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The UC Santa Cruz Police Department instituted a pilot Campus Night Safety Escort Program that operates Monday through Thursday from 8:30 p.m. to 12:15 a.m. There may be exceptions for holidays. This service is provided at no charge; it does not run during the summer session months. Individuals needing an escort can call the Police Dispatch Center, at (831) 459-2100.

The Safety Escort Program is staffed by Student Ambassadors who are employed by the Police Department. 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 Campus 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 Ambassadors reserve the right to refuse transport. Additionally, the Ambassadors may provide walking escorts in lieu of using a vehicle.

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## FIRE SYSTEM UPGRADES

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During the past 18 months, UC Santa Cruz has upgraded its fire alarm systems in the following locations: Merrill A and B Dorms. In the next 24 months, Kerr Hall, Thimann Labs, Science & Engineering Library, Cowell College Academic/Administration buildings, and Kresge College Administrative buildings are scheduled to have

new fire sprinkler systems installed. Upgrades to existing fire alarm systems are expected to occur at Sinsheimer Labs, Earth and Marine Sciences, and Science and Engineering Library. In addition, seismic upgrades being conducted for Student Union buildings at the Quarry Plaza.

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## ENVIRONMENTAL HEALTH AND SAFETY SAFEGUARDS AND IMPROVEMENTS

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The Environmental Health and Safety (EH&S) office, in cooperation with campus departments, monitors facility safety relating to research operations at UC Santa Cruz. EH&S is responsible for monitoring compliance with environmental, health, and safety programs intended to prevent occupational injuries and illnesses in the workplace and to protect the quality of the surrounding environment. EH&S advises the campus research community of responsibilities with respect to health, safety, and environmental issues; recommends appropriate corrective actions; and implements new health and safety programs as needed.

EH&S also acts as liaison between UCSC and various external agencies and regulatory bodies. Several improvements have been made to established protocols and procedures over the past 18 months, and will continue into the next 24 months. Laboratory safety programs with regard to injury and illness prevention, radiation safety, biosafety, chemical safety, and animal care and use in research programs have been and continue to be enhanced.

Moreover, researcher training, medical surveillance, hazard analysis, and personal protective equipment programs continue to grow to ensure that research operations are performed safely and according to all applicable regulations.

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## UC SANTA CRUZ ARTS DIVISION SAFETY IMPROVEMENTS

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### UNIVERSITY OF CALIFORNIA PERFORMING ARTS SAFETY CENTER OF EXCELLENCE

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In October 2012, the University of California (UC) Office of the President established a systemwide position and focus on Theater Safety, entitled the Performing Arts

## Increased Safety Measures and Safeguards

Safety Center of Excellence. This position and initiative was created as loss experience for the UC system indicated that teaching, research, and work activities within the Performing Arts can result in serious injuries and may represent significant risk to faculty, staff and students.

Services provided by the Center of Excellence support health and safety in Performing Arts units and include:

- Auditing Injury & Illness Prevention Programs (IIPP)
- Conducting facility health & safety inspections
- Performing risk assessments of higher hazard operations
- Providing health & safety education and outreach materials

### UC SANTA CRUZ ARTS DIVISION SAFETY AND SECURITY PROGRAMS

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The campus and Arts Division have coordinated to have a comprehensive safety and security survey performed for the facilities, parking areas, and walking paths in and around Arts Division facilities. Recommendations and improvements being implemented include installation of new exterior lights on pathways and in parking areas; maintenance and repair of existing exterior light fixtures; and trimming and pruning of trees, shrubbery and foliage that is blocking lighting or creating security concerns near paths and parking lots.

The UC Center of Excellence for Performing Arts Safety has:

- Developed and distributed the UC Performing Arts Safety Manual
- Developed and delivered a two-day Theater Fall Protection Competent Person Training

- Coordinated a 10-hour OSHA Certification training specifically developed and targeted to theater operations staff

The UC Santa Cruz Arts Division has received Be Smart About Safety funding for the following projects:

- Procurement of specialized equipment, including an aerial work platform and mobile scaffold system, to access areas and perform routine operations at height. This equipment allows faculty, staff and students to safely work at height and has eliminated the routine use of tall portable "A" frame ladders for certain activities.
- Procurement of new OSHA- and-ANSI certified fall-arrest harnesses and self-retracting lifelines that allow Theater Arts staff to safely perform high hazard operations where other forms of fall protection (guardrails, safety nets, etc.) cannot be installed.
- An extensive capital project to install a fixed staircase and improve the seismic integrity of guardrails in two UCSC Theater facilities. These improvements will eliminate the need for faculty, staff, and students to routinely use vertical ladders and improves the overall primary fall prevention safeguards by strengthening the guardrail system.
- Improvements to the Art Department Woodshop local exhaust ventilation system and elimination of manual material handling hazards associated with moving and dumping large barrels of sawdust.
- Elimination of shop hazards, including removal of a non-compliant radial arm saw and procurement and installation of a new panel saw that reduces the likelihood of a saw-related injury and improves material handling activities in the shop.

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