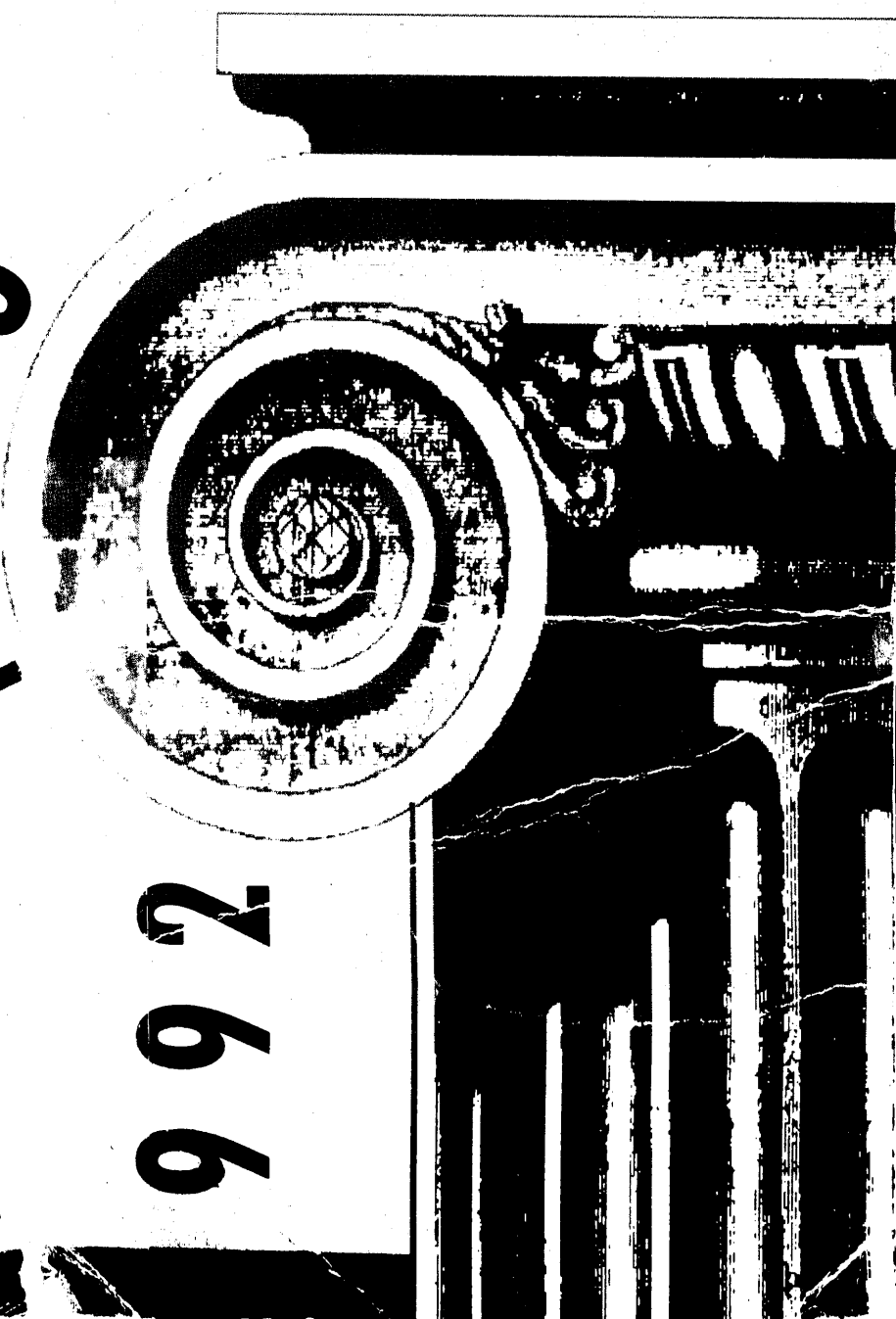


# General

## CATALOG

1993

992



# CORRESPONDENCE DIRECTORY

## Campus Directory Information

(619) 534-2230

### UNDERGRADUATE

<b>Admissions</b>	Registrar & Admissions	Building 301, Matthews Administrative and Academic Complex, 0021A, (619) 534-3160
<b>Educational Opportunity Program (EOP)</b>	Student Outreach and Recruitment Office	Student Center, Building B, 0337, 534-4831
<b>Financial Aids</b> (Loans and Grants)	Student Financial Services	Building 210, Matthews Administrative and Academic Complex, 0013, 534-4480
<b>Foreign Students' Affairs</b>	Office of International Education	International Center, 0018, 534-3730
<b>Housing</b> On-Campus Off-Campus	Housing Administration Office of Housing Services	Building 206, Matthews Administrative and Academic Complex, 0041, 534-4010 Student Center Building B, 0309, 534-3670
<b>Part-Time Employment</b> On-Campus Off-Campus	Career Services Center	Career Services Center, 0330, 534-4500
<b>Provosts</b> Fifth College Muir College Revelle College Third College Earl Warren College	Building 412 H&SS Building, Room 2126 Revelle Provost Building Third College Admin. Building Literature Building, Room 3210	Matthews Administrative and Academic Complex, 0069, 534-2235 Muir Campus, 0106, 534-3583 Revelle Campus, 0321, 534-3262 Third Campus, 0509, 534-4002 Warren Campus, 0422, 534-4350
<b>Registration</b>	Registrar & Admissions	Building 301, Matthews Administrative and Academic Complex, 0021A, 534-3150
<b>Residence Status</b>	Registrar & Admissions	Building 301, Matthews Administrative and Academic Complex, 0021A, 534-3152
<b>Scholarships</b>	Student Financial Services	Building 214, Matthews Administrative and Academic Complex, 0013, 534-4480
<b>Student Activities</b>	Price Center	Price Center, 0078, 534-4090

### GRADUATE

<b>Dean of Graduate Studies and Research</b>	Office of Graduate Studies and Research	Building 520, Matthews Administrative and Academic Complex, 0003, 534-3555
<b>Admissions</b>	(Address the appropriate department of instruction.)	
<b>Affirmative Action</b>	Office of Graduate Studies and Research	Building 518, Matthews Administrative and Academic Complex, 0003, 534-3871
<b>Fellowships</b>	Office of Graduate Studies and Research	Building 518, Matthews Administrative and Academic Complex, 0003, 534-3556
<b>Financial Aids</b> (Loans and Grants)	Student Financial Services	Building 210, Matthews Administrative and Academic Complex, 0013, 534-3807
<b>Graduate Women's Program</b>	Office of Graduate Studies and Research	Building 518, Matthews Administrative and Academic Complex, 0003, 534-3550
<b>Housing</b>	Graduate Apartments, Residential Apartments Office	9224 B Regents Road, 0907, 534-2952
<b>Teaching and Research Assistantships</b>	(Address the appropriate department of instruction.)	

### SCHOOL OF MEDICINE

<b>Admissions</b>	Admissions Office	162 Medical Teaching Facility, 0621, 534-3880
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NOTE:

While efforts have been made to assure the accuracy of statements in this catalog, it must be understood that all courses, course descriptions, designations of instructors, and all curricular and degree requirements contained herein are subject to change or elimination without notice. Students should consult the appropriate department, school, college, or graduate division for current information, as well as for any special rules or requirements imposed by the department, school, college, or graduate division.

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General Catalog  
1992-93

University of California,  
San Diego

Price: \$3.50  
By Mail: \$5.50

# ACADEMIC AND ADMINISTRATIVE CALENDAR, 1992-93

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## Fall Quarter, 1992

Fall quarter begins	Monday, September 21
Instruction begins	Thursday, September 24
Thanksgiving holiday	Thursday-Friday, Nov. 26-27
Instruction ends	Friday, December 4
Final exams	Monday-Saturday, December 7-12
Fall quarter ends	Saturday, December 12
Christmas holidays	Thursday-Friday, Dec. 24-25
New Year holidays	Thursday-Friday, Dec. 31-Jan. 1

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## Winter Quarter, 1993

Winter quarter begins	Monday, January 4
Instruction begins	Monday, January 4
Martin Luther King, Jr. holiday	Monday, January 18
Presidents' Day holiday	Monday, February 15
Instruction ends	Friday, March 12
Final exams	Monday-Saturday, March 15-20
Winter quarter ends	Saturday, March 20
Academic and administrative holiday	Monday, March 22

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## Spring Quarter, 1993

Spring quarter begins	Friday, March 26
Instruction begins	Monday, March 29
Memorial Day holiday observance	Monday, May 31
Instruction ends	Friday, June 4
Final exams	Monday-Saturday, June 7-12
Spring quarter ends	Saturday, June 12
Commencement	Sunday, June 13
Independence Day holiday	Monday, July 5
Labor Day holiday	Monday, September 6

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# University of California, San Diego

## Catalog Evaluation

Please help us evaluate the effectiveness of the *General Catalog* by answering the following questions:

1. I find the catalog to be visually pleasing. \_\_\_\_\_ yes \_\_\_\_\_ no
2. The information in the catalog is clearly presented. \_\_\_\_\_ yes \_\_\_\_\_ no
3. The index seems to be complete. \_\_\_\_\_ yes \_\_\_\_\_ no
4. The UCSD *General Catalog* attracts me to the institution. \_\_\_\_\_ yes \_\_\_\_\_ no
5. Were any catalog sections confusing? If so, which ones? \_\_\_\_\_  
\_\_\_\_\_
6. Did you have trouble finding any information you needed? If so, what information was this? \_\_\_\_\_  
\_\_\_\_\_
7. Please list any additional information you would like to have included in the catalog, or any additional comments you have. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Please check all applicable categories to describe yourself:

- \_\_\_\_\_ I am a potential UCSD applicant.
- \_\_\_\_\_ I have applied or definitely plan to apply to UCSD.
- \_\_\_\_\_ I have been accepted at UCSD.
- \_\_\_\_\_ I am a high school student: \_\_\_\_\_ freshman \_\_\_\_\_ sophomore  
\_\_\_\_\_ junior \_\_\_\_\_ senior
- \_\_\_\_\_ I am a two-year college student, contemplating transfer to UCSD.
- \_\_\_\_\_ I am a four-year college student, contemplating transfer to UCSD.
- \_\_\_\_\_ I am in college, contemplating graduate study in \_\_\_\_\_ (subject).
- \_\_\_\_\_ I am a UCSD student: \_\_\_\_\_ freshman \_\_\_\_\_ sophomore \_\_\_\_\_ junior  
\_\_\_\_\_ senior \_\_\_\_\_ medical student  
\_\_\_\_\_ graduate student in \_\_\_\_\_ (dept.)
- \_\_\_\_\_ I am a junior high school counselor.
- \_\_\_\_\_ I am a senior high school counselor.
- \_\_\_\_\_ I am a community college counselor.
- \_\_\_\_\_ I am a parent of a UCSD applicant or prospective applicant.
- \_\_\_\_\_ I am a UCSD faculty member.
- \_\_\_\_\_ I am a UCSD staff member.
- \_\_\_\_\_ I am a \_\_\_\_\_ faculty \_\_\_\_\_ staff member at \_\_\_\_\_
- \_\_\_\_\_ I reside in California.
- \_\_\_\_\_ I reside in another state or country.
- \_\_\_\_\_ Other (describe) \_\_\_\_\_

Please detach this page from the catalog, fold and staple as indicated, and send to address on reverse side.

**To express our appreciation for your cooperation, a UCSD decal will be sent to participants in this survey.**

Name \_\_\_\_\_

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State \_\_\_\_\_ Zip Code \_\_\_\_\_



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92/93

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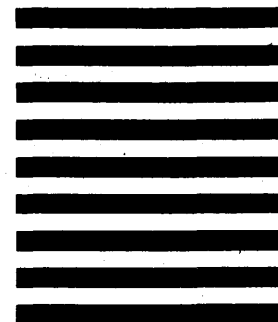
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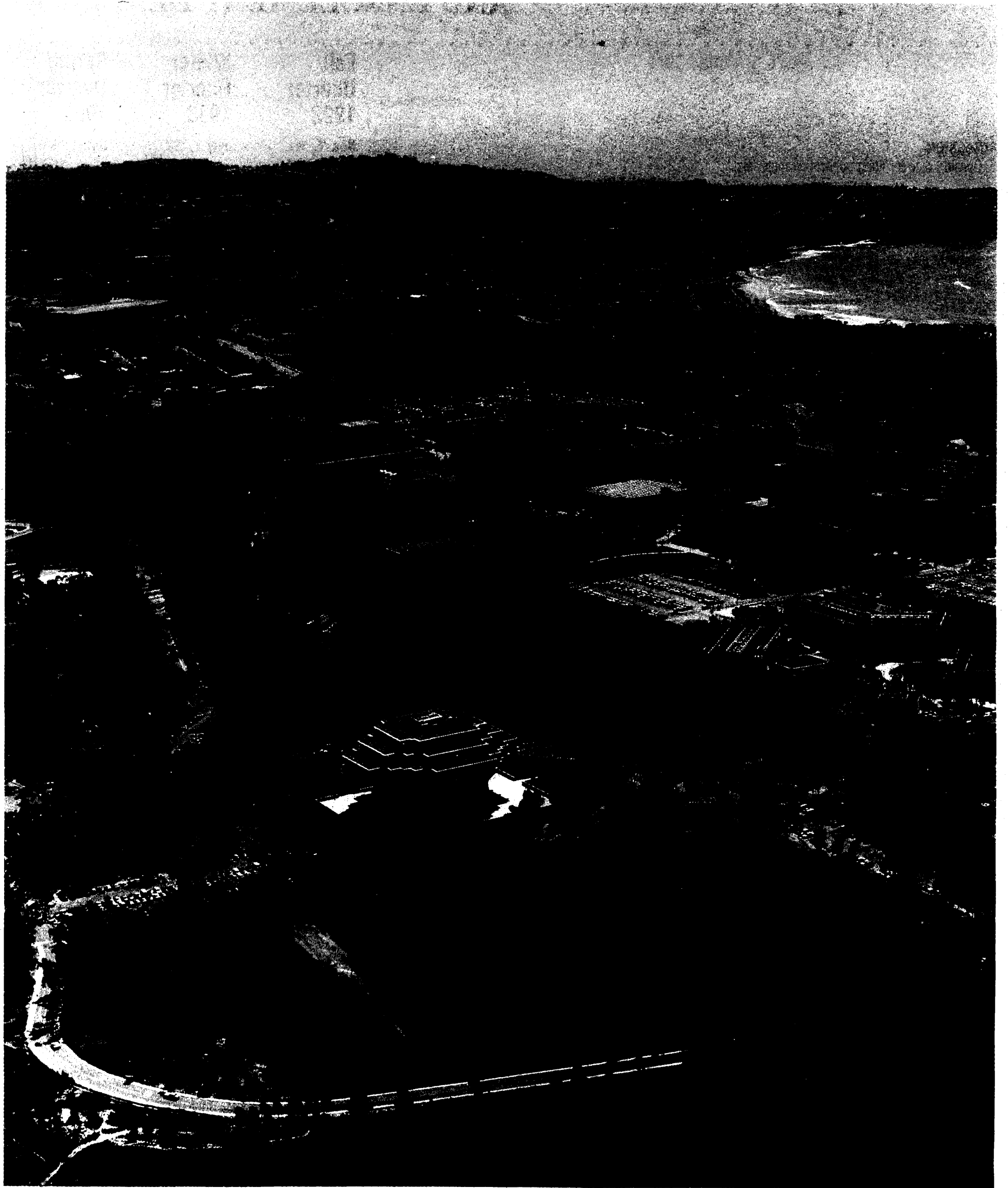
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# UNDERGRADUATE ADMISSION INFORMATION AND ENROLLMENT DEADLINES

	<b>Fall Quarter 1992</b>	<b>Winter Quarter 1993</b>	<b>Spring Quarter 1993</b>
<b>ADMISSION</b> Opening date for filing application materials	<b>Nov. 1, '91</b>	<b>July 1, '92</b>	<b>Oct. 1, '92</b>
PRIORITY DEADLINE FOR APPLICATIONS FOR FINANCIAL AID	March 2, '92	Nov. 1, '92	Feb. 1, '92
PRIORITY TELEPHONE ENROLLMENT Students may enroll by telephone. Students may use add cards to enroll in restricted courses during or after their priority appointment time. Students may pay fees in person at Cashier's Office after enrolling.	May 6-31	Nov. 4-29	Feb. 10-Mar. 7
BILLING STATEMENTS MAILED TO ENROLLED STUDENTS	Aug. 1-Sept. 19	Dec. 7-19	March 8-20
OPEN ENROLLMENT Students may enroll by telephone without appointments. Students may add, drop, or change grading option and variable units by telephone. Students may use add cards to enroll in restricted courses.	June 1-Sept. 18	Nov. 30-Dec. 23	March 8-24
NEW STUDENT ENROLLMENT	June 15-Sept. 18	Dec. 7-18	March 15-19
DEADLINE DAY TO ENROLL WITHOUT LATE FEES Students who have not enrolled will be assessed \$100 in late fees. (\$50 late enrollment fee and \$50 late payment fee)	Sept. 18	Dec. 23	March 24
<b>QUARTER BEGINS</b>	<b>Sept. 21</b>	<b>Jan. 4</b>	<b>March 26</b>
LAST DAY FOR STUDENTS WHO MET ENROLLMENT DEADLINE TO PAY REGISTRATION FEES WITHOUT \$50 LATE PAYMENT FEE	Sept. 23	Dec. 30	March 26
LAST DAY FOR STUDENTS ON FINANCIAL AID, SCHOLARSHIPS, AND FULL FEE WAIVERS TO SIGN AND RETURN STATEMENT FORM IF NOT ATTENDING	Sept. 23	Dec. 30	March 26
LATE REGISTRATION PERIOD FOR ALL STUDENTS	Sept. 24-Oct. 9	Jan. 4-15	Mar. 29-Apr. 9
<b>INSTRUCTION BEGINS</b>	<b>Sept. 24</b>	<b>Jan. 4</b>	<b>March 29</b>
ADD/CHANGE/DROP PERIOD	Sept. 24-Oct. 9	Jan. 4-15	Mar. 29-Apr. 9
DEADLINE DAY TO PAY REGISTRATION FEES TO AVOID CANCELLATION OF CLASSES	Oct. 9	Jan. 15	April 9
FINAL DAY TO ADD COURSES	Oct. 9	Jan. 15	April 9
LAST DAY TO APPLY FOR PART-TIME STATUS	Oct. 9	Jan. 15	April 9
FINAL CLASS SCHEDULES (CLASS CONFIRMATIONS) MAILED TO ALL STUDENTS	Oct. 12	Jan. 19	April 12
LAST DAY TO CHANGE GRADING OPTION, CHANGE VARIABLE UNITS	Oct. 23	Jan. 29	April 23
DROP PERIOD CONTINUES Last day to drop without "W" Last day to drop with "W" or final grade must be assigned	Oct. 12-Nov. 30 Oct. 23 Nov. 30	Jan. 19-Mar. 5 Jan. 29 March 5	Apr. 12-May 28 April 23 May 28
<b>INSTRUCTION ENDS</b>	<b>Dec. 4</b>	<b>March 12</b>	<b>June 4</b>
FINAL EXAMINATIONS	Dec. 7-12	March 15-20	June 7-12
FINAL DAY TO FILE "REQUEST TO RECEIVE GRADE INCOMPLETE"	Dec. 11	March 19	June 11
<b>QUARTER ENDS</b>	<b>Dec. 12</b>	<b>March 20</b>	<b>June 12</b>
COMMENCEMENT			June 12/13

# GRADUATE ADMISSION INFORMATION AND ENROLLMENT DEADLINES

## Fall Quarter 1992

### ADMISSION

Applicants should check with their prospective departments for deadline dates.

### APPLICATIONS FOR FELLOWSHIPS

Deadline date for filing application materials

Jan. 15 '92

Notice of awards

April 1

Acceptance of awards

April 15

(NOTE: Most departments adhere to these dates for assistantships also, but many will accept later applications.)

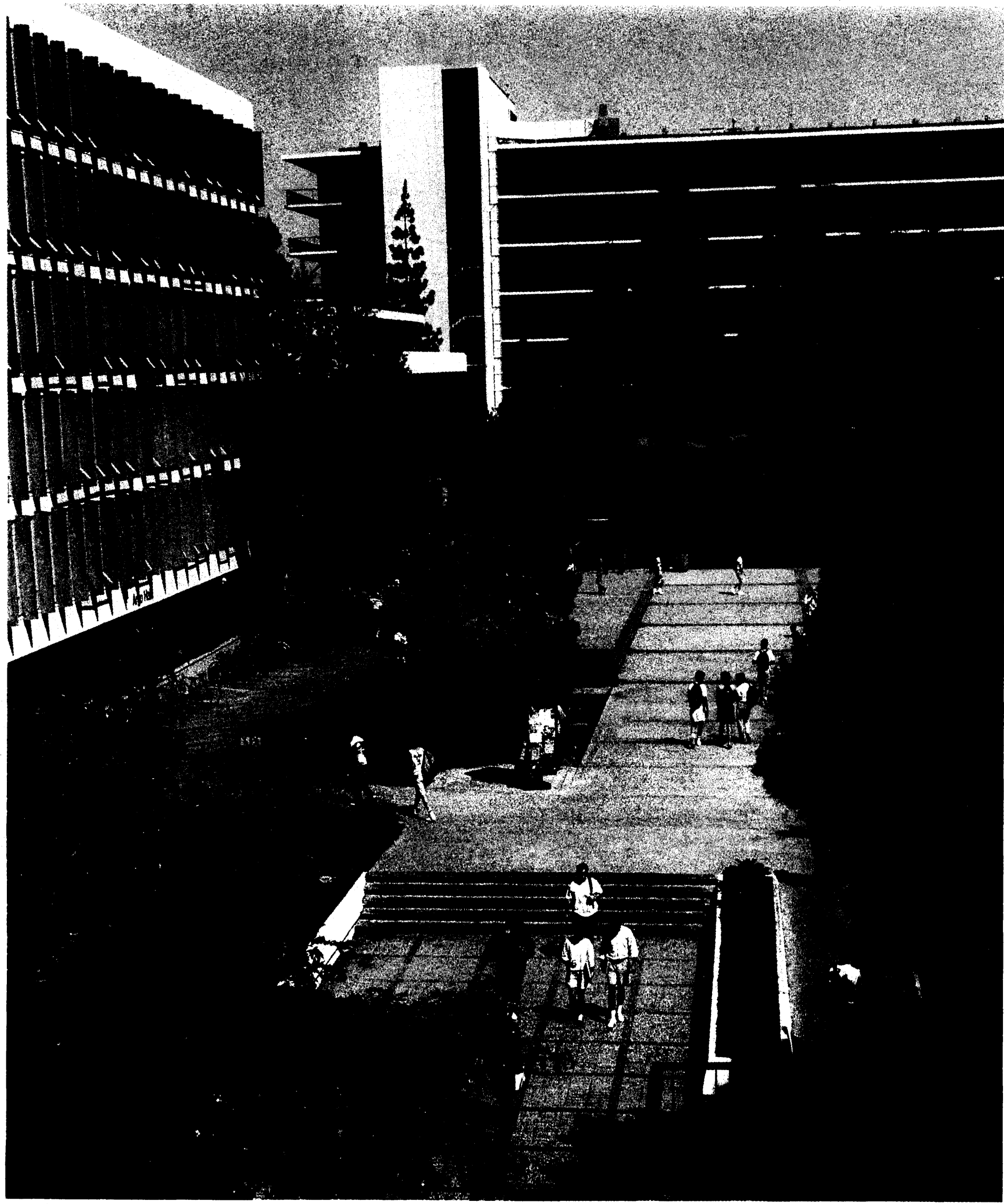
### DEADLINE FOR APPLICATIONS FOR FINANCIAL AID

June 1

## GRADUATE ENROLLMENT DEADLINES

	<b>Fall Quarter 1992</b>	<b>Winter Quarter 1993</b>	<b>Spring Quarter 1993</b>
TELEPHONE PRIORITY ENROLLMENT: CONTINUING STUDENTS	May 6-31	Nov. 4-29	Feb. 10-Mar. 7
OPEN ENROLLMENT	June 1-Sept. 18	Nov. 30-Dec. 23	Mar. 8-24
NEW STUDENT ENROLLMENT	June 15-Sept. 18	Dec. 7-18	Mar. 15-19
APPLICATION FOR INTERCAMPUS EXCHANGE PROGRAM	Aug. 21	Dec. 4	Feb. 26
FILING APPROVED LEAVE OF ABSENCE	Oct. 8	Jan. 18	April 12
SCHOOL OF MEDICINE DEADLINES (Refer to School of Medicine announcement for deadlines.)			
DEADLINE DAY TO ENROLL WITHOUT LATE FEES	Sept. 18	Dec. 23	March 24
Students who have not enrolled will be assessed \$100. (\$50 late enrollment fee and \$50 late payment fee)			
<b>QUARTER BEGINS</b>	<b>Sept. 21</b>	<b>Jan. 4</b>	<b>March 26</b>
<b>INSTRUCTION BEGINS</b>	<b>Sept. 24</b>	<b>Jan. 4</b>	<b>March 29</b>
LATE REGISTRATION			
Last day for students who met enrollment deadline to pay registration fees without \$50 late payment fee	Sept. 23	Jan. 4	March 26
Enrollment and payment of fees after this date requires a General Petition and payment of \$50 for late enrollment and \$50 for late payment of fees, totaling \$100.	Sept. 18	Dec. 23	March 24
DEADLINE FOR CHANGE OF PROGRAM	Oct. 9	Jan. 15	April 9
DEADLINE TO CHANGE OF GRADING OPTION	Oct. 23	Jan. 29	April 23
DEADLINE FOR DROPPING CLASSES WITHOUT "W" APPEARING ON THE TRANSCRIPT	Oct. 23	Jan. 29	April 23
MASTER'S DEGREE			
Filing for advancement to candidacy	Oct. 8	Jan. 18	April 12
Filing approved thesis	Dec. 11	March 19	June 4
DOCTOR OF PHILOSOPHY DEGREE			
Filing draft dissertation with doctoral committee	Nov. 13	Feb. 19	May 7
Filing approved dissertation and related materials	Dec. 11	March 19	June 4
DROPPING CLASSES WITHOUT PENALTY OF "F" GRADE	Nov. 30	March 5	May 28
<b>INSTRUCTION ENDS</b>	<b>Dec. 4</b>	<b>March 12</b>	<b>June 4</b>
FINAL EXAMINATIONS	Dec. 7-12	March 15-20	June 7-12
REMOVING INCOMPLETE GRADES (I) ASSIGNED IN PRIOR QUARTER	Dec. 11	March 19	June 11
<b>QUARTER ENDS</b>	<b>Dec. 12</b>	<b>March 20</b>	<b>June 12</b>
COMMENCEMENT			June 13
COMPLETION OF REQUIREMENTS			
Final date for completion of all requirements for degrees to be awarded at end of quarter	Dec. 11	March 19	June 12

Dates are subject to change.





# INTRODUCTION

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## **A MAJOR DECISION**

Choosing a college or university is clearly among the most decisive choices of a lifetime. The direction and tenor of a student's future will inevitably be deeply influenced by the experiences of the undergraduate years. The choice of a college or university should, therefore, be made with seriousness and deliberation, not casually.

At this moment, you may be considering the merits of several institutions of higher learning in order to make an informed and intelligent choice. What qualities and assets might make UCSD attractive to you? What might make you decide to apply elsewhere?

These and other related questions will be addressed in this brief introduction. The information presented here should help you to decide whether UCSD can provide the kind of education for which you are best suited.

For it should be clearly understood that UCSD exists primarily for one fundamental purpose: to educate. UCSD is intellectually challenging and academically intensive. Although its site is appealing, UCSD is not a coastal playground in which to amuse oneself while waiting to enter "the real world." UCSD is, in fact, a significant part of the real world; it is a *working* university which fosters effort and honors achievement.

The student who enters UCSD with this concept clearly in mind will find the experience of the undergraduate years here powerfully rewarding. The rewards will come not only in intellectual satisfaction, but also in philosophical enrichment and in the benefits of social life. Here at UCSD, on the bluffs overlooking the Pacific, students work and live in an environment shared with a faculty whose research and teaching are recognized for excellence virtually around the world. And here, on this beautiful 1,200-acre wooded campus, students make friendships that will carry meaning all their lives.

## **A FEW WORDS OF HISTORY**

UCSD, one of the newest of the nine campuses which make up the University of California system, celebrated its twenty-fifth anniversary during the 1985-86 academic year. The other campuses of the University of California

are located in Berkeley, Davis, San Francisco, Santa Cruz, Santa Barbara, Riverside, Los Angeles, and Irvine. Each campus has its own distinct academic and social character. And each offers programs and facilities which set it off from the others. UCSD is unique not only in those features, but also in its history.

As a member of the nine-campus family of the University of California, UCSD is, despite its newness, fully a university in scale and scope. Graduate and undergraduate programs, offered in a wide range of disciplines, lead to the bachelor's, master's, M.D., and Ph.D. degrees. UCSD's Scripps Institution of Oceanography is internationally renowned, and UCSD's School of Medicine has won national acclaim for excellence. UCSD's Graduate School of International Relations and Pacific Studies, approved by the regents in 1986, is the only school of international affairs in the UC system. The regents approved a new School of Architecture in 1988, and its curriculum is currently in the planning stages; it should accept its first students in fall 1992. At both the undergraduate and graduate levels, UCSD's curricula and programs have been singled out for high rankings in recent surveys of American higher education.

UCSD enrolled its first undergraduates in 1964. Nevertheless, the campus can trace its origins in this area as far back as the late 1800s. At that time, zoologists on the Berkeley campus, seeking a suitable location for a marine field station, found La Jolla a very desirable site. The facility they established became a part of the University of California in 1912 and was eventually named the Scripps Institution of Oceanography. When, in the late 1950s, the Regents of the University of California decided to situate a general campus in the San Diego region, the Scripps Institution and its small but distinguished staff of scientists formed the nucleus around which the new campus was to grow.

Today UCSD is recognized throughout the academic world both for the eminence of its faculty and for the quality of its graduate and undergraduate programs. The history of its growth may help to explain how, in the short span of some three decades, UCSD has been able to achieve a stature comparable to that of

institutions which were founded a century or more ago.

The growth of UCSD did not happen by accident. The rise to distinction resulted from wise and careful planning by visionary faculty and administrators. To accomplish the bold objective of creating a first-rate university in a remarkably short time, these planners sought from the outset to attract the best scholars the academic world could offer and to build the new campus around them.

Thanks to the foresight of those planners, the faculty of UCSD now includes six Nobel laureates (four of whom hold joint appointments with the nearby Salk Institute); one winner of the Fields Medal in mathematics; six recipients of the National Medal of Science; one winner of the Pulitzer Prize; fifty-four members of the National Academy of Sciences; sixty-two Fellows of the American Academy of Arts and Sciences; ten Fellows of the American Philosophical Society; eight fellows of the Econometric Society; twelve members of the National Academy of Engineering; seven members of the International Academy of Astronautics; ten members of the Institute of Medicine; and three members of the National Academy of Education.

UCSD houses a chapter of Phi Beta Kappa, the oldest, most prestigious honor society for the liberal arts and sciences in America. The campus is one of 240 four-year institutions selected for this distinction since the society was founded in 1776, and more than 200 current faculty and staff are members.

The vision of UCSD's planners is being fulfilled as well through the distinguished reputation of the programs and curricula offered by its much-honored faculty.

In addition, UCSD is officially accredited by the Accrediting Commission for Senior Colleges and Universities of the Western Association of Schools and Colleges.

## **OTHER POINTS TO CONSIDER**

There are certain other facts about UCSD which you should consider in making your choice. Among them are:

- UCSD, a full-fledged, four-year undergraduate campus, is also a full-fledged graduate

## INTRODUCTION

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and research institution. Why is UCSD's strength in graduate teaching and research of importance to undergraduates? The answer is at once simple and profound: UCSD faculty and scholars are continually involved in an impressive variety of research and developmental projects which puts this campus on the cutting edge of science and technology, and in the forefront in the arts and humanities.

- San Diego has become one of America's major centers for high-technology electronics and biomedical industries. Students concentrating on sciences or engineering are actively sought by these industries to fill summer jobs and career positions. Off-campus internships also are available to UCSD students in all fields of study, with opportunities to serve at local television stations, in charity organizations, and in local, state, and federal government agencies as well as in a diverse array of local businesses.

- UCSD is recognized nationally as a major center for the arts and humanities, including music and theater.

- Undergraduates are offered opportunities to participate in certain research projects conducted by UCSD faculty. An example is UCSD's nationally famed PASCAL program, which was developed by a group of undergraduate students in UCSD's computer laboratories. PASCAL is credited by leaders in the microcomputer field with revolutionizing the writing of computer programs. A number of UCSD undergraduates have developed computer skills that have led to their employment by leading computer manufacturers, and still others have gone on to form their own software enterprises as a direct result of their UCSD training.

- UCSD's unique small-college structure encourages undergraduates to play a more active role in student government, social life, and athletics than is generally open to them in other major universities. Opportunities for involvement in student governance are especially strong as there are student governing bodies at the campus-wide level as well as within the five separate colleges.

- UCSD fields twenty-two men's and women's intercollegiate athletic teams. Campus athletic facilities include two gymnasiums, two swimming pools (one twenty-five yard, one fifty-meter), and numerous tennis and handball courts. The university's recreational and intramural athletic programs are among the most varied and extensive in the nation today.

## MAJOR FIELDS OF STUDY

UCSD offers a wide variety of nationally recognized majors in a broad array of fields, summarized in the list below. (For a listing of graduate programs, refer to the section of this catalog titled "Graduate Studies.") New programs with strong emphasis on fundamentals have been developed without the encumbrances of tradition. Increasing numbers of highly qualified students are being attracted to these innovative programs and by the opportunity to study with an outstanding faculty.

The academic departments of UCSD are listed below. Details and requirements of the various individual courses are found in the "Courses, Curricula, and Programs of Instruction" section of the catalog.

UCSD has deliberately chosen to limit the number of its academic departments. For example, there is only one Department of Literature, and the major subareas of biology are not fragmented into separate departments. This system has proved especially valuable to undergraduates who choose to avoid overspecialization early in their studies.

A number of special, individually oriented programs utilize the combined resources of two or more departments. Among these are Chinese Studies, Classical Studies, Japanese Studies, Middle East Studies, the Teacher Education Program, Third World Studies, and Urban Studies and Planning.

Engineering students may choose from a number of majors in the Department of Applied Mechanics and Engineering Sciences (AMES), the Department of Computer Science and Engineering (CSE), or the Department of Electrical and Computer Engineering (ECE). All three departments seek to educate the engineer of tomorrow, with increased emphasis on computer methods and systems science.

Undergraduates interested in premedicine and prelaw majors should note that a variety of departments can serve their needs. For premed students, the common choices are biology, chemistry, psychology, and bioengineering (AMES). However, more and more students are electing double majors or are combining non-traditional majors with science majors. For prelaw students, nearly any undergraduate major will qualify a student for admission to a law school.

Should you need help in deciding upon a major, many UCSD professionals are available to aid you. Among them are the academic advisers in the provosts' offices of the various

colleges, faculty members, and departmental advisers (who can help you to select an appropriate curriculum). Additional specialists in the Career Services Center and in Psychological and Counseling Services are available to help you appraise your personal aptitudes.

### Undergraduate Departments

#### ARTS

Music  
Theatre  
Visual Arts

#### DIVISION OF ENGINEERING

AMES (Applied Mechanics and Engineering Sciences)  
CSE (Computer Science and Engineering)  
ECE (Electrical and Computer Engineering)

#### HUMANITIES

History  
Literature  
Philosophy

#### SCIENCE AND MATHEMATICS

Biology  
Chemistry  
Mathematics  
Physics

#### SOCIAL SCIENCE

Anthropology  
Cognitive Science  
Communication  
Economics  
Ethnic Studies  
Linguistics  
Political Science  
Psychology  
Sociology

**DEPARTMENTAL UNDERGRADUATE MAJORS**

<b>ANTHROPOLOGY</b>		<b>ECONOMICS</b>		<b>PHILOSOPHY</b>	
Anthropology	B.A.	Economics	B.A.	Philosophy	B.A.
Anthropology (Biological Anthropology)	B.A.	Quantitative Economics and Decision Sciences	B.A.	<b>PHYSICS</b>	
<b>APPLIED MECHANICS AND ENGINEERING SCIENCES (AMES)</b>		<b>EDUCATION (see Footnote 1)</b>		Physics	B.S.
Applied Mechanics	B.A./B.S.	<b>ELECTRICAL AND COMPUTER ENGINEERING (ECE)</b>		Physics/Biophysics	B.S.
Bioengineering	B.S.	Applied Physics	B.A.	Physics/Biophysics (Pre-medical)	B.S.
Bioengineering: Premedical	B.A./B.S.	Information Science	B.A.	Physics with Specialization in Earth Sciences	B.S.
Systems and Control Engineering	B.S.	Computer Engineering	B.S.	<b>POLITICAL SCIENCE</b>	
Chemical Engineering	B.S.	Electrical Engineering	B.S.	Political Science	B.A.
Engineering Sciences	B.S.	Engineering Physics	B.S.	<b>PRELAW (see Footnote 2)</b>	
Mechanical Engineering	B.S.	<b>ENGINEERING (see AMES, CSE, and ECE)</b>		<b>PREMEDICAL (see Footnote 3)</b>	
Structural Engineering	B.S.	<b>ENGLISH (see Literature)</b>		<b>PSYCHOLOGY</b>	
<b>BIOLOGY</b>		<b>ETHNIC STUDIES</b>		Psychology	B.A.
General Biology	B.S.	Ethnic Studies	B.A.	<b>SOCIOLOGY</b>	
Animal Physiology	B.S.	<b>HISTORY</b>		Sociology	B.A.
Biochemistry and Cell Biology	B.S.	History	B.A.	<b>TEACHER EDUCATION (see Footnote 1)</b>	
Ecology, Behavior, and Evolution	B.S.	<b>LINGUISTICS</b>		<b>THEATRE</b>	
Microbiology	B.S.	Linguistics	B.A.	Theatre	B.A.
Molecular Biology	B.S.	<b>LITERATURE</b>		<b>VISUAL ARTS</b>	
<b>CHEMICAL ENGINEERING (see AMES)</b>		Literatures in English	B.A.	Studio	B.A.
<b>CHEMISTRY</b>		French Literature	B.A.	Art History/Criticism	B.A.
Chemistry	B.A./B.S.	General Literature	B.A.	Media	B.A.
Chemistry/Biochemistry	B.A./B.S.	German Literature	B.A.	<b>INTERDISCIPLINARY MAJORS (see Footnote 4)</b>	
Chemistry/Chemical Physics	B.S.	Italian Literature	B.A.	Chinese Studies	B.A.
Chemistry with Specialization in Earth Sciences	B.S.	Russian Literature	B.A.	Classical Studies	B.A.
		Spanish Literature	B.A.	College Special Individual Majors	B.A.
		Literature/Writing	B.A.	Italian Studies	B.A.
<b>COGNITIVE SCIENCE</b>		<b>MATHEMATICS</b>		Judaic Studies	B.A.
Cognitive Science	B.A./B.S.	Mathematics	B.A.	Religious Studies	B.A.
<b>COMMUNICATION</b>		Applied Mathematics	B.A.	Third World Studies	B.A.
Communication	B.A.	Applied Mathematics (Scientific Programming)	B.A.	Urban Studies and Planning	B.A.
<b>COMPUTER SCIENCE AND ENGINEERING (CSE)</b>		Mathematics—Computer Science	B.A.		
Computer Science	B.A./B.S.	<b>MUSIC</b>			
Computer Engineering	B.S.	Music	B.A.		
		Music/Humanities	B.A.		

Footnote 1: The teaching credential in California requires an academic major, plus professional preparation courses in education, an approved program of practice teaching or an internship, and a full year of college work beyond the baccalaureate. The UCSD Teacher Education Program (TEP) leads to a single subject (secondary) or multiple-subjects (elementary) credential.

Footnote 2: Law schools do not require any particular major, but they do require evidence of good scholarship in demanding subjects. Almost any undergraduate major can qualify a student for consideration by a law school. The UCSD staff includes professional prelaw advisers.

Footnote 3: Like law schools, medical schools do not generally demand a particular major but ask for a solid background in the sciences upon which medicine is built. Most premed students major in biology, chemistry, physics, or bioengineering, but a substantial number major in the humanities and social sciences. The UCSD staff includes professional premedical advisers.

Footnote 4: Interdisciplinary majors usually consist of a prescribed collection of courses from two or more departments. Students interested in such majors should consult the "Courses, Curricula, and Programs of Instruction" section at the back of this catalog.

## INTRODUCTION

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### **SPECIAL DEPARTMENTAL EMPHASES**

The following are some special departmental emphases that are of interest to a number of students.

- UCSD has three departments that offer both undergraduate and graduate degrees in *engineering*. Majors include applied mechanics, applied physics, bioengineering, bioengineering: premedical, chemical engineering, computer engineering, electrical engineering, engineering physics, engineering science, information science, systems science, mechanical engineering, structural engineering, applied mechanics, applied ocean science, computer science, and communication theory and systems.
- An undergraduate major in biochemistry and cell biology is offered by the Department of Biology. An undergraduate major in chemistry/biochemistry is offered by the Department of Chemistry. These majors are described in the biology and chemistry sections of this catalog. Both the Department of Biology and the Department of Chemistry offer graduate programs with specialization in biochemistry.
- The Department of Visual Arts offers excellent programs in fine arts studio work, art history and criticism, and media and visual arts. However, UCSD offers no courses in commercial art.
- The Department of Psychology offers courses in all major areas of experimental psychology, with choices of experimental approaches. The department also offers a general psychology major but nothing in the fields of humanistic psychology or clinical psychology. A major in cognitive science is offered by the Department of Cognitive Science.
- The Teacher Education Program (TEP) offers a program of study leading to the preliminary and clear single subject and multiple subjects credentials. Graduates of this program are qualified for teaching positions in elementary and secondary schools.

### **SUMMER SESSION**

UCSD offers a Summer Session consisting of a diverse range of courses selected from the regular undergraduate curriculum and taught by UCSD faculty. In addition, Summer Session provides special educational opportunities not easily available during the regular school year, offers expanded opportunities for international education, and gives students a chance to en-

joy courses featuring innovative formats or content, or taught by new or visiting faculty.

The Summer Session program is open to UCSD students, students of other colleges and universities, qualified high school seniors, and the general public. Credit courses designed to meet the advanced educational needs of selected professionals, such as teachers and engineers, are also offered.

Summer Session catalogs and registration forms are available in mid-March of each year. For free copies write to Summer Session Office, Mail Code 0179, University of California, San Diego, La Jolla, CA 92093-0179, or call (619) 534-4364.

### **WHAT UCSD DOES NOT OFFER**

Although the range and variety of programs offered at UCSD are very wide, there are certain disciplines which are not available on this campus. In some instances, the absence of a particular program reflects the academic philosophy of the UCSD campus and its faculty. In others, the absence of a curriculum is temporary, awaiting the availability of funds, personnel, or facilities before a program can be offered. In still others, programs have not been included which would, in the university's judgment, unnecessarily duplicate comparable of-

ferings on other UC campuses or at other institutions.

Among undergraduate majors currently not available at UCSD are:

1. Business.
2. Oceanography. Although UCSD does not offer an undergraduate major in oceanography, students planning to pursue oceanography at the graduate level may select from a large number of undergraduate courses in the physical, biological, and earth sciences to build a firm foundation for later graduate work.
3. Nursing.
4. Industrial Arts.
5. Journalism. Although no major in journalism is offered, the Department of Literature offers a major in writing that can emphasize journalistic writing, and the development of writing skills is stressed in many disciplines. Many courses offered in the humanities and social sciences will provide the kind of broad-based preparation needed by practicing journalists. Several student newspapers are published on campus, providing ample "laboratory" opportunities for students to practice journalism.
6. Geography.
7. Physical Education. However, a minor in physical education is offered. Note: UCSD





does not offer athletic scholarships, and there is no intercollegiate football team at UCSD.

### **THE COLLEGES OF UCSD**

UCSD undergraduates enjoy the benefits of a great university without the disadvantages of "bigness" found in many of today's "mega-universities." The master plan conceived by UCSD's planners borrowed from the Oxford and Cambridge concept to provide a "family" of colleges, each with its own special academic and social "flavor." UCSD's students thus gain a sense of "belonging" through affiliation with one of the campus's semi-autonomous colleges.

Currently there are five colleges: Revelle, John Muir, Third, Earl Warren, and Fifth. Each of the five is independent, yet all are interrelated: all university academic and support facilities are available to all students, regardless of their college affiliation.

Each college is designed to accommodate approximately 2,500 students. Each has its own residence halls, commons (which include dining facilities and meeting rooms), and classrooms. Each college has its own educational philosophies and traditions, its own set of general-education requirements, and its own administrative and advising staff. The objective is to give students and faculty the advantages of a small, liberal-arts college combined with the best features of a major university.

Students applying to UCSD should select a college in order of their preference.

Details regarding the individual colleges are given in the "Choosing a College at UCSD" section of the catalog.

### **RECREATION AT UCSD**

UCSD's undergraduate colleges are situated on a park-like, 1,200-acre site high on the bluffs overlooking the Pacific Ocean at La Jolla. Long famed as a vacation and retirement community, La Jolla boasts some of the finest beaches and coves, restaurants, art galleries, and other attractions in the nation.

Much of UCSD's recreational and social life centers on the waterfront, with surfing, SCUBA diving, and beach parties among the favorite diversions of UCSD students. Throughout the area, students find a variety of amusements, ranging from the small-town atmosphere of waterfront Del Mar southward to the open-air markets of Tijuana and the primitive wilderness of Mexico's Baja California peninsula.

The city of San Diego, some twelve miles south of the campus, offers a wide range of recreational opportunities, including Old Town (California's birthplace), Sea World on Mission Bay, and the world-famous San Diego Zoo and Wild Animal Park. A year-round calendar of major league sporting events is offered in the city's Sports Arena and in San Diego Jack Murphy Stadium, home of the Padres and the Chargers.

For theater-lovers there are numerous theatres in San Diego, including the Old Globe Theater in Balboa Park, site of the National Shakespeare Festival every summer. A year-round program of contemporary and classical professional theater may be enjoyed in the Old Globe and the adjacent Cassius Carter Center Stage, and special summer theater fare is featured on the park's outdoor Festival Stage.

On-campus entertainment includes a year-round series of movies and cultural programs, dances, chamber music, and rock-band concerts sponsored by the University Events Office. The Department of Theatre presents plays in both the 500-seat Mandell Weiss Theatre and the new 500-seat Forum Theatre. The Department of Visual Arts offers a continuing series of art shows in the Mandeville Art Gallery and displays of student art in other campus galleries.

Informal meeting places on campus are hubs of student activity throughout the day and evening, among them the Muir Rathskeller, Third College Mountain View Lounge, and the Price Center.

### **MOUNTAINS, DESERTS, AND BEACHES**

Many Southern Californians live out-of-doors the year around. The San Diego metropolitan area—which includes the UCSD campus—enjoys the most comfortable climate in the United States, twelve months of the year.

Fishing opportunities are plentiful offshore in kelp beds west of La Jolla and surrounding the Coronado Islands in Mexican waters. Bass and trout fishing are available in nearby lakes. An hour's drive to the east, the Laguna Mountains provide pleasure at all seasons for campers and hikers. Beyond the Lagunas lies the vast Anza-Borrego Desert with its breathtaking display of wildflowers every spring.

The peninsula of Baja California, one of the world's last great wilderness areas, stretches for 900 miles southward from the international

gateway at Tijuana. The peninsula—a mecca for lovers of unspoiled beaches and untouched mountains and deserts—is the site every year of the grueling Baja cross-country auto race.

### **"MOST SPORTS-MINDED CAMPUS IN AMERICA"**

Through its intercollegiate athletic and intramural programs, UCSD provides its students with one of the more extensive and competitive sports programs in the United States. UCSD fields twenty-two intercollegiate athletic teams along with seven club sports teams, while the intramural program provides for student competition in twenty sports in three categories of play: men, women, and coed.

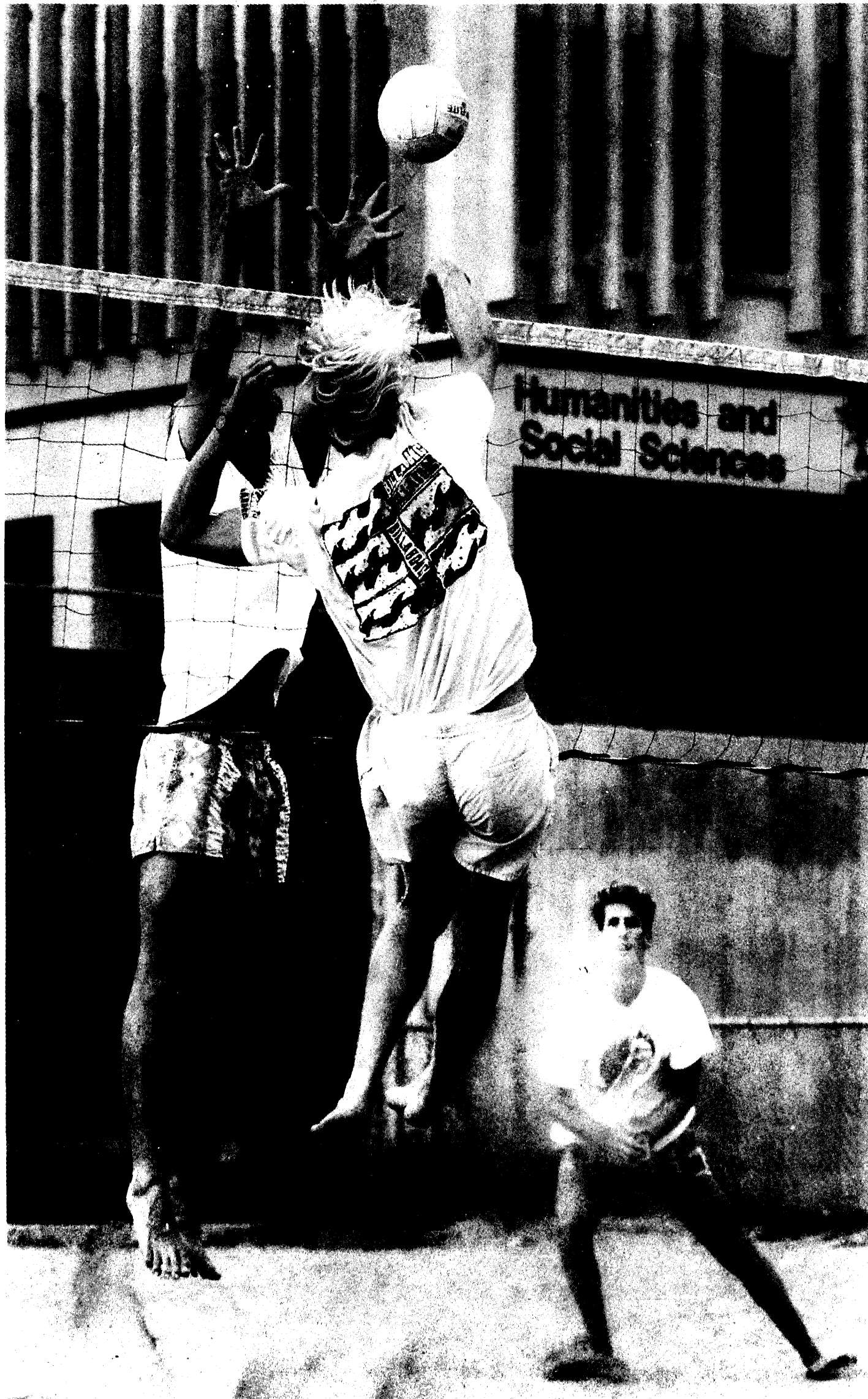
Intramural sports are highly popular with UCSD students. An estimated 60 percent of all students take part in one or more of the more than 1,500 teams involved in various sports during the course of the academic year.

A \$1.8 million outdoor athletic facility includes a fifty-meter competition-sized swimming pool, a whirlpool bath, and four racquetball/handball courts among other amenities. This facility supplements the twenty-five-yard indoor natatorium, gymnasiums, tennis and handball courts, and various athletic fields elsewhere on the campus.

### **NEED MORE INFORMATION? CHECK THE FOLLOWING:**

- How do I apply for admission? See page 39. (See also "Note," below.)
- How much does a UCSD education cost? See "Fees and Expenses," pages 51, 52.
- What's the grading system at UCSD? See page 66.
- How should I decide which college to choose at UCSD? See next page.
- What services and facilities are available to students at UCSD? See page 95.
- Where do I write for more information? See inside front cover.

NOTE: An admissions packet for students interested in applying to UCSD can be obtained from any California high school or junior college counselor's office. Out-of-state students may request a packet by writing to the Office of Admissions on any University of California campus.



# CHOOSING A COLLEGE AT UCSD

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One of the features which sets UCSD apart from most major universities in the United States is its family of small colleges: Revelle, John Muir, Third, Earl Warren, and Fifth.

The division of UCSD's campus community into small undergraduate colleges was purposeful, and not a chance event. Planners of the new campus examined the various alternatives available and decided upon the small-college concept which has served Oxford and Cambridge so successfully for centuries. The planners were convinced that many—if not most—students learn more, and find greater fulfillment in their personal lives, when they are joined academically and socially with a relatively small group of fellow students and faculty. But the planners also understood that there are many advantages to “bigness” in a university: a faculty of international renown, first-rank teaching and research facilities, laboratories, libraries, and other amenities of size.

These planners wisely determined, therefore, to create an arrangement which would combine the best aspects of a large research university with the finest features of a small liberal arts college. The answer was—and is—the UCSD collegiate system, a series of semiautonomous undergraduate colleges, each with its own faculty, residential and academic facilities, and distinctive educational philosophy. The system was inaugurated with the opening of Revelle in 1964. In the intervening years, four more colleges—John Muir, Third, Warren, and Fifth—have been established. The separate college structure may be found today on many American university campuses. In most cases, however, these colleges are designed to serve specific disciplines—engineering, agriculture, and business administration, as examples. This is not the case at UCSD. Instead, at UCSD any undergraduate may select a major from the full range of majors available. The choice of a college is based, therefore, not on one's major, but upon one's preferences in terms of the various educational philosophies and environments offered by the various colleges.

UCSD's college system allows undergraduates to choose among *five* distinct general-education curricula supplementing their major requirements. These curricula range from a

very structured liberal-arts program to a program with a broad range of electives. By contrast, most universities offer only *one* general-education curriculum.

Students must select a college in order of preference when applying for admission.

Brief summaries of the various college curricula and philosophies follow. Later in this section, these variations are spelled out in considerable detail, college by college.

## **REVELLE COLLEGE EDUCATIONAL PHILOSOPHY**

Revelle College stresses the broad character of general education. During the first two years at Revelle, a student spends roughly one-third of his or her class time in mathematics and the natural sciences and the other two-thirds in social sciences, humanities, foreign language, and the fine arts. These two years of structured liberal-arts courses help to establish a strong educational foundation. Throughout the final two years, students concentrate on developing professional competence in one academic discipline and a basic understanding of another unrelated academic field.

This curriculum develops three main skills which are essential for a well-rounded education: learning to use the language of scholarship and science, learning how to think creatively, and learning how to learn.

## **MUIR COLLEGE EDUCATIONAL PHILOSOPHY**

The faculty of John Muir College has established a flexible set of general-education and graduation requirements that ensures breadth and depth of learning and encourages the students of the college to take an active role in their own intellectual development. Students complete four year-long sequences drawn from the social sciences; the natural sciences or mathematics; and the humanities, fine arts, or foreign languages. Many choices are available for each of the four year-long sequences. Students also complete two expository writing courses. Muir's requirements accommodate a wide range of interests and aptitudes. The relative openness and flexibility of its curriculum makes Muir College particularly attractive to ex-

ceptionally able and well-prepared students with well-defined or developing academic interests.

John Muir College is distinguished by its atmosphere of friendliness and informality and a deep concern for the rights and welfare of others. Concern for one's fellow students goes well with Muir's educational philosophy, which stresses individual choice and development. The environment thus created, fostering independence and responsibility, has helped to make Muir the largest of UCSD's colleges.

## **THIRD COLLEGE EDUCATIONAL PHILOSOPHY**

Third College is a liberal arts and sciences college dedicated to the development of the scholar and citizen. Students pursue majors in the social sciences, natural and physical sciences, mathematics, engineering, humanities, and fine arts.

The college's educational philosophy is guided by the belief that regardless of a student's major, a broad liberal arts education must include an awareness and understanding of the diversity of cultures and the variety of ways culture enables people to fashion lives of dignity. Therefore, the distinctive general-education requirements have a rich tradition of emphasizing a critical examination of the human condition in a multicultural society.

The three-quarter core sequence, “**Dimensions of Culture**—Diversity, Justice and Imagination” is designed as an interdisciplinary, issues-oriented curricular experience that seeks to balance an exploration of uniquely American, Western, and non-Western culture. Students are also required to complete courses in mathematics, natural/physical sciences, writing, humanities, and fine arts.

In addition to the strong academic program, Third College is proud of its emphasis on the student as citizen. Our Student Leadership Program is especially designed to encourage active participation in the governance of the college and in community public service.

## **WARREN COLLEGE EDUCATIONAL PHILOSOPHY**

Warren College emphasizes curricula and programs that assist students in making a

close connection between their undergraduate education and their personal and professional goals for their postbaccalaureate years. This approach applies to all students, whether their career aspirations lie in the professions, the arts, or the sciences. As a means of supplementing curricular requirements, the college encourages students to take advantage of academic internships and career-life planning programs to sharpen their skills and test their career choices.

To ensure an in-depth exposure to the humanities/fine arts, the social sciences and the natural sciences, Warren students are required to take a number of courses in each of these areas. These courses are to be chosen carefully, with assistance from the college staff and faculty, to prepare the student for his or her postbaccalaureate career.

▼ **FIFTH COLLEGE  
EDUCATIONAL PHILOSOPHY**

Fifth College faculty believe that to be truly educated in today's world, students must learn about their own cultural heritage as well as the cultures of other major countries in the world. Therefore, the general-education requirements of the college have an international orientation designed to instill in students, regardless of major, a global perspective.

The centerpiece of the general-education curriculum, a six-quarter sequence entitled "The Making of the Modern World," will encourage students to think historically, across cultures and across disciplines, about both Western and non-Western cultures. In addition, students will complete course work in at least one foreign language, as well as a two-quarter fine arts requirement designed to ensure familiarity with both Western and non-Western music, visual arts, or theatre. Each student will also complete a three-course regional specialization designed to foster learning in greater depth about a single geographic area. Students who wish to complete a minor may combine foreign language course work with a related regional specialization to form a minor in, for example, Russian or Japanese studies. To round out their general education, students will complete two courses in math or computer science and two courses in natural sciences. All students in Fifth College will be encouraged and helped to find a way to study, work, or travel in another country as part of their education.

Its international focus does not mean that Fifth College students are restricted in their choice of major. In fact, they may select any major offered at UCSD. The difference is that its general education requirements help all its undergraduates, regardless of major, to understand the forces past and present that make all nations increasingly dependent on the global community today. This broad international background also makes them more attractive majors to graduate schools, professional schools, and the business world.

**COLLEGE ADMINISTRATION**

The provost is a faculty member who acts as the chief administrative officer and academic dean. In addition to the provost, each college has a director of academic advising and a dean of student life.

The college academic advising offices and the academic departments are the designated campus units responsible for providing official academic advice and direction to undergraduate students. The college academic advising offices have primary responsibility for providing academic advice and services that assist new and continuing students to develop educational plans and course schedules which are compatible with their interests, academic preparation, and educational and career goals.

The academic advising offices conduct academic orientation/registration programs for all new students and advise continuing students about college general-education and graduation requirements. The advising staff of each college provides general academic and curricular information, clarifies academic rules and regulations, reviews all aspects of academic probation, monitors academic progress, assists students with decision-making strategies, and gives information about prerequisites and screening criteria for majors. In conjunction with the academic departments and the Office of the Registrar, the advising offices certify graduation and generally facilitate students' academic adjustment to the university.

Moreover, academic advisers are available to counsel students about educational alternatives; selection of courses and majors; program changes; new academic opportunities; and special programs such as exchange programs, honors programs, outreach programs, etc.

With a central concern for student development, dean's staff members provide a variety of nonacademic services such as coordinating both educational and social programs; over-

seeing residential programs; assisting students with decisions and procedures regarding withdrawal from school; coordinating disciplinary procedures, both academic and social; and making referrals to other student services on campus. (See also section on "Student Services and Programs.")

Whatever the question or the problem, the provost and his or her staff stand ready at all times to help undergraduates in need of counsel.

**PHI BETA KAPPA**

The UCSD chapter of Phi Beta Kappa elects student members on the basis of high scholastic achievement in academic programs emphasizing the liberal arts and sciences. Phi Beta Kappa was founded in 1776 at the College of William and Mary in Virginia and is the oldest, most prestigious, academic honor society in America. See also "Honors" in the index.

**HONORS**

Each college awards honors to outstanding students on the basis of criteria approved by the Academic Senate. Approximately 14 percent of graduating seniors are eligible for college honors. These honors are posted on students' transcripts and noted on their diplomas.

For further details, see "Honors" in the index.

**TRANSFER STUDENTS**

Students who transfer to one of UCSD's five colleges from other institutions must complete the graduation requirements of the college of their choice. To determine which courses already completed by a student may be applied to his or her graduation requirements, the provost's academic advising office will evaluate the student's prior course record at the time of his or her initial enrollment in UCSD. Students may not receive units for courses which duplicate previous credits.

**COLLEGE GENERAL-  
EDUCATION REQUIREMENTS**

The general-education requirements of UCSD's five undergraduate colleges differ noticeably. In some cases, these requirements can significantly extend the time required to obtain a B.S. degree in engineering. Prospective engineering students should review the general-education requirements and take them into account when selecting a college.





## GRADUATION REQUIREMENTS IN THE UCSD COLLEGES

Unless otherwise indicated, the figures in this chart refer to the number of COURSES rather than the number of units required for new first-year students. Transfer students must consult college academic advisers to determine their specific general-education requirements. Each quarter most students normally carry four four-unit courses. Subjects are broadly classified as humanities, fine arts, social sciences, natural sciences, and mathematics. When a subject is listed as "noncontiguous," it must be in one of the categories which is different from that of the major. Students must meet the Subject A requirement prior to enrolling in the writing courses of their respective college.

### General Education

#### REVELLE COLLEGE

HUMANITIES ..... 5  
Includes two six-unit courses with intensive instruction in university-level writing. Written work is also required in the remaining three courses, each four-units

PHYSICS AND CHEMISTRY .. 4  
A total of four courses with at least one course from each area

BIOLOGY ..... 1

FOREIGN LANGUAGE ..... 0-4  
number of courses to attain proficiency

CALCULUS ..... 3

SOCIAL SCIENCES ..... 3  
Three courses in the social sciences, chosen from an approved list, to include two courses in the same social science, and at least one course in American Cultures.

FINE ARTS ..... 1  
Art, music, theatre

#### MUIR COLLEGE

WRITING ..... 2-3

A THREE-COURSE SEQUENCE ..... 3  
in SOCIAL SCIENCE

A THREE-COURSE SEQUENCE ..... 3  
in either

MATHEMATICAL SCIENCE  
or  
NATURAL SCIENCE

A THREE-COURSE SEQUENCE ..... 6  
in each of TWO of the following categories:

HUMANITIES  
FINE ARTS  
FOREIGN LANGUAGE

#### THIRD COLLEGE

"DIMENSIONS OF CULTURE" ..... 3  
(DIVERSITY, JUSTICE & IMAGINATION)

Includes two six-unit courses with intensive instruction in university-level writing

NATURAL SCIENCES ..... 3  
One course each in biology, chemistry, and physics

MATHEMATICS & LOGIC .... 2

HUMANITIES & CULTURE ... 2

DISCIPLINARY BREADTH .... 4  
Must be noncontiguous to the major field of study. Two of these courses must be upper-division. At least one course must include significant writing.

FINE ARTS ..... 1

PUBLIC SERVICE ... (optional)  
This four-unit public service option can be used to fulfill one course in the Disciplinary Breadth area.

#### WARREN COLLEGE

WRITING ..... 2

ETHICS and SOCIETY ..... 1

FORMAL SKILLS ..... 2

Two courses in calculus  
OR  
Two in symbolic logic  
OR  
Two in computer science  
OR  
One in computer science and one in symbolic logic

PROGRAMS OF CONCENTRATION\* ..... 12  
(for B.A./B.S. degrees in arts/sciences)

Two programs of concentration, each typically consisting of three lower-division and three upper-division courses. Both programs must be noncontiguous to the major and to each other.

AREA STUDIES\* ..... 6  
(for B.S. degrees in engineering)  
Two area studies each consisting of three courses. One area of study in humanities/fine arts and one in social sciences.

\*One of these courses or one course in the major must be chosen from an approved list on cultural diversity.

#### FIFTH COLLEGE

THE MAKING OF THE MODERN WORLD ..... 6  
Includes two six-unit courses with intensive instruction in university-level writing.

FOREIGN LANGUAGE ..... 2-3  
One quarter may be waived for highly proficient students.

FINE ARTS ..... 2  
To include study of both Western and non-Western arts.

REGIONAL SPECIALIZATION ..... 3  
To include at least two courses taken at the upper-division level.

MATHEMATICS/COMPUTER SCIENCE ..... 2

NATURAL SCIENCES ..... 2

UPPER-DIVISION WRITING ... 1  
At least one upper-division course in each student's program must include a significant writing component.

### Minor

One required. Six courses focused in one noncontiguous subject area OR any six noncontiguous courses. At least three of these courses must be upper-division.

OPTIONAL

OPTIONAL

See "PROGRAMS OF CONCENTRATION" and "AREA STUDIES" in "General Education" section above.

OPTIONAL. Students may combine foreign language and regional specialization course work to create a minor focusing on a particular geographic area.

### Major

Majors are identical regardless of the student's chosen college. Most majors require twelve to eighteen upper-division courses based upon adequate lower-division preparation; such preparation may be part of the general-education requirements. Majors in certain engineering programs may require as many as twenty-two upper-division courses.

### Total Number of Courses Required for Graduation

B.A./B.S. degrees require 46 courses (184 units) minimum.

B.A./B.S. degrees require 45 courses (180 units). At least 18 courses (72 units) must be upper-division.

B.A./B.S. degrees require 45 courses (180 units). At least 15 courses (60 units) must be upper-division.

B.A./B.S. degrees require 45 courses (180 units). At least 15 courses (60 units) must be upper-division.

B.A./B.S. degrees require 45 courses (180 units). At least 15 courses (60 units) must be upper-division.



# REVELLE COLLEGE

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Revelle College, the first college on the UCSD campus, was named in honor of Dr. Roger Revelle, former university-wide dean of research and for many years director of UCSD's Scripps Institution of Oceanography.

Formerly called the School of Science and Engineering and later First College, Revelle College was established in 1958. After being temporarily housed on the Scripps campus, Revelle moved into its first complete buildings during the 1963-64 academic year. In 1960 Revelle began a graduate program in the physical sciences. From that beginning, it rapidly developed its humanities and social science programs, and today the teaching program reflects a broad spectrum of learning.

With the establishment of Revelle College, the faculty was given a rare opportunity to shape an undergraduate curriculum that would, insofar as any educational program can, prepare its students for the modern world. From the outset of planning the curriculum, the faculty asked: What sort of knowledge must students have if they are to be liberally educated? In what areas? To what depth? How specialized must that education be in the undergraduate years?

The educational philosophy of Revelle College was developed in response to such fundamental questions. Its undergraduate program is based on the assumption that students who are granted the bachelor's degree will have attained:

1. An acceptable level of general education in mathematics; foreign language; the physical, biological, and social sciences; the fine arts; and the humanities.
2. Preprofessional competence in one academic discipline.
3. An understanding of an academic area outside their major field.

To this end, a lower-division curriculum has been established which should enable students to acquire an understanding of the fundamental problems, methods, and powers of the humanities and the arts, the social and behavioral sciences, mathematics, and the natural sciences.

The lower-division curriculum assumes that undergraduates should not concentrate heavily in a special field until they have had a chance

to learn something about the various fields that are open to them. Their general education must, then, be thorough enough for them to see the possibilities in those fields. Early in their careers, they should know three languages: their own, a foreign language, and the universal language of mathematics. They will study a foreign language as a spoken, vital means of communication; studying that language, they will come to know something of the general nature of language itself. And they will study mathematics as part of general education and as preparation for required courses in the physical and biological sciences. They will learn more about their own culture in a two-year program of study in the humanities and fine arts, which requires the regular writing of essays. Finally, they will, as sophomores, study the social and behavioral sciences, including a course which focuses on the study of American ethnic groups and their interactions. Once they have completed this program, they will be ready for the relatively more specialized work of the upper division.

During the students' junior and senior years, their main efforts will be devoted to intensive work in their major fields at a level of competence that will enable them to continue their study at the graduate level.

The students' general education will not, however, stop at the end of the sophomore year; in addition to their majors, all upper-division students will do substantial work in an area or areas of learning distinctly different in content and method from that of the major. (Generally, the following will be considered "areas of learning" in the above sense: mathematics and natural sciences, the social sciences, humanities.)

Revelle College stresses the broad character of its curriculum. Every student, for example, is required to achieve a certain competence in calculus. The emphasis on calculus and physical science is in some respects a deviation from educational theory of the last hundred years. The older "general-education" theory demanded that scientists achieve a reasonable competence in the social sciences and humanities. The rising importance of science and technology justifies the application of the theory to nonscientists as well.

Four years of college can at best yield only a limited knowledge; the major task is to train students so that they can adapt quickly and effectively to the rapidly changing world.

## **GENERAL-EDUCATION REQUIREMENTS**

Students are encouraged to meet the general-education requirements and the prerequisites to the major as rapidly as possible. Variations within the program will occur, of course, depending on the student's interest, prior training, and ability to make use of individual study.

Freshmen who enter with Advanced Placement credits can use many of these advanced courses to meet general-education requirements (see Advanced Placement chart in "Undergraduate Admissions, Policies and Procedures"). Transfer students may meet all general-education requirements before entering by following articulation agreements with community colleges or taking at any institution courses which Revelle College deems approximately equivalent in content to those at UCSD.

Those who demonstrate superior achievement and competence in an academic area may take advanced courses and individual study programs.

In order to fulfill the requirements in the principal fields of knowledge, the student takes a recommended set of courses, the prerequisites for which have been met by the general admission standards of the university.

The general-education requirements are:

1. Satisfaction of the general University of California requirements in Subject A and American History and Institutions.
2. A five-course sequence in an interdisciplinary humanities program including two six-unit courses with intensive instruction in university-level writing. Written work is also required in the remaining (four-unit) three-quarter courses.
3. One course in the fine arts.
4. Three lower-division courses in the social sciences, chosen from an approved list, to include two courses in the same social science and at least one course in American cultures.

5. Three courses in mathematics (three quarters of calculus).
6. Five courses in the physical and biological sciences to include four quarters of physics and chemistry and one quarter of biology.
7. Basic conversational and reading proficiency in a modern foreign language or advanced reading proficiency in a classical language.

### 1. SUBJECT A AND AMERICAN HISTORY AND INSTITUTIONS

Satisfaction of the university requirements in Subject A and American History and Institutions. (See "Subject A," "Undergraduate Registration," "Academic Regulations," "Humanities," and "Undergraduate Admissions, Policies and Procedures: American History and Institutions.")

### 2. HUMANITIES

The purposes of the general-education requirement in humanities are two-fold: (a) to confront students with significant humanistic issues in the context of a rigorous course which can serve as an introduction to the academic disciplines of history, literature, and philosophy; (b) to provide training and practice in rhetorical skills, especially persuasive written expression.

Students may meet this requirement by satisfactorily completing five courses of the interdisciplinary humanities program offered by the Departments of History, Literature, and Philosophy, which focus on some of the great documents of civilization. The sequence of courses, Humanities 1 through 5, is designed to meet the humanities and writing requirement of Revelle College. (Students must have satisfied the university's Subject A requirement before registering for this sequence.)

In connection with learning about the Western tradition, students in Humanities 1 and 2 (six units each) will receive intensive instruction in university-level writing. Instruction in writing is provided in discussion sections, and frequent writing exercises are required. Written work is also required in the remaining three quarters of the sequence (Humanities 3-4-5, four units each).

For course descriptions, see "Courses, Curricula, and Programs of Instruction: Humanities."

### 3. FINE ARTS

One course is required to provide an introduction to the fundamental experience in the interpretation of creativity in theatre, music, or

visual arts. (See "Courses, Curricula, and Programs of Instruction: Theatre, Music, and Visual Arts.")

### 4. SOCIAL SCIENCES

Three lower-division courses offered by the Departments of Anthropology, Cognitive Science, Cultural Traditions (Women's Studies), Economics, Ethnic Studies, History, Linguistics, Political Science, Psychology, Sociology, or Urban Studies and Planning, *from an approved list available at the Provost's Office*. Effective for freshmen entering fall 1991 and later, and for transfer students entering fall 1994 and later, at least one of these courses must be from a list approved as meeting the requirement in American cultures.

### 5. MATHEMATICS

Mathematics has for centuries held an important place in education, in the sciences, and in the humanities. As an integral part of their liberal education, students will be brought into contact with a significant area of mathematics. Furthermore, they will gain the facility to apply mathematics in their studies of the physical, biological, and behavioral sciences.

There are two beginning-year sequences which meet the Revelle College mathematics requirement. Both sequences include integral and differential calculus. Freshman placement in these sequences is dependent upon the student's high school or college preparation in mathematics (as evidenced by a placement examination) as well as future plans. Students are urged to keep their mathematical skills at a high level by taking mathematics during their junior and senior years in high school. Students who have completed college courses in calculus or who present advanced-placement credit in mathematics may not receive credit for mathematics courses which duplicate their advanced-standing work; however, they will be encouraged to further their study of higher mathematics. (See "Courses, Curricula, and Programs of Instruction: Mathematics.")

### 6. NATURAL SCIENCES

The natural science courses, including the physical and biological sciences, present the fundamental concepts of modern physics, chemistry, and biology. For the student who may major in one of these disciplines, the courses provide a background and preparation for further study; for those students who will

continue their studies outside the natural sciences, they offer an opportunity to gain a certain understanding and appreciation of current developments in these fields.

Students choose their five required physical and biological science courses from the following sequences depending upon their interests, prior preparation, and intended majors. The Department of Chemistry offers Chemistry 11, 12, 13, Chemistry 6A-B-C, and Chemistry 7A-B. The Department of Physics offers three calculus-based sequences: Physics 1A-B-C, Physics 2A-B-C-D, and Physics 4A-B-C-D-E. The Department of Biology offers Biology 1, 3, or 11 to meet the Revelle biology requirement. (See "Chemistry," "Physics," and "Biology" in the "Courses, Curricula, and Programs of Instruction" section of this catalog.)

*Students planning to major in a science must consult the appropriate departmental listing under "Courses, Curricula, and Programs of Instruction" to find the additional preparation needed for their major.*

### 7. FOREIGN LANGUAGE

Revelle College students are required to demonstrate basic conversational and reading proficiency in any modern foreign language, or advanced reading proficiency in a classical language.

Modern foreign language programs are currently offered in Chinese, French, German, Hebrew, Italian, Japanese, Russian and Spanish, and classical language programs are offered in Greek, Latin, and Hebrew. Students who have preparation in other languages should see the Office of the Revelle Provost to arrange a proficiency examination. This exam may also be taken by native speakers of any foreign language without further course study.

The language requirement is normally satisfied well before the end of the student's second year at Revelle College. About a quarter of the students entering, after three or four years of a language in high school, satisfy the requirement by examination upon entrance. The option of satisfying the language requirement by examination is also available at the end of the third quarter of college-level language study for students who wish to take it. A placement examination is given in French, Spanish, German, and Russian. A language studied in high school for two or more years may be continued by placing into Linguistics 1B/1BX, 1C/1CX, and 1D/1DX or Literature 2A, and by passing Literature 2A or both Linguistics 1D

and 1DX with a grade of C — or better. Or a student may choose to begin the study of a new language and satisfy the requirement by taking Linguistics 1A/1AX, 1B/1BX, 1C/1CX, and 1D/1DX or Literature 2A, and passing Literature 2A or 1D/1DX with a grade of C — or better. Or a student may satisfy the requirement by passing (with a grade of C — or better) the fourth quarter of any modern or classical language course at UCSD. For any language, the fourth-quarter course must be taken at UCSD in order to satisfy the language requirement.

FALL	WINTER	SPRING
<b>FRESHMAN YEAR</b>		
Foreign Language	Humanities 1	Humanities 2
Mathematics	Foreign Language	Foreign Language
Natural Science	Mathematics	Mathematics
Subject A or Fine Art	Natural Science	Natural Science
<b>SOPHOMORE YEAR</b>		
Natural Science	Natural Science	Fine Art or elective
Social Science*	Social Science	Social Science
Humanities 3	Humanities 4	Humanities 5
Foreign Language	Elective	Elective

\*Science majors may want to take part of the social science requirement in the junior year to allow time for additional science laboratories and/or mathematics.

## THE MAJOR

All undergraduate majors offered at UCSD are available to Revelle College students. An exceptional student who has some unusual but definite academic interest for which a suitable major is not offered on the San Diego campus may, with the consent of the provost of the college and with the assistance of a faculty adviser, plan his or her own major. The Revelle Individual Major must be submitted no later than three quarters before the student's intended graduation and be approved by the Executive Committee of the college before it may be accepted in lieu of a departmental or interdepartmental major. The faculty adviser will supervise the student's work, and the provost must certify that the student has completed the requirements of the individual major before the degree is granted.

Students who fail to attain a grade-point average of at least 2.0 in work taken in the prerequisites for the major, or in the courses in the major, may, at the option of the department, be denied the privilege of entering or of continuing in that major. Students majoring in AMES, CSE, ECE, communication, economics, QEDS, or math/computer science need to be aware of additional screening for acceptance into the major.



## NONCONTIGUOUS MINOR

In addition to the major and the general-education requirements, Revelle College students are required to complete six courses in an area of studies *other than* that of the major. For the purposes of this requirement, the humanities, the social sciences, and the natural sciences (including mathematics) will be considered three different areas. At least three of the six courses must be at the upper-division level. It will be the student's responsibility to obtain assurance from the Office of the Revelle Provost that the courses which the student has chosen are noncontiguous. Courses used to satisfy general-education requirements may not be used again to fulfill a minor requirement; the minor comprises six courses distinct from those used on general-education or major requirements. During the junior year a student must specify how he or she will satisfy the minor requirement. (Forms are at the Office of the Revelle Provost.) Minor programs are subject to approval by the provost. The requirement may be met in one of the following ways:

1. *Department Minor*—All six noncontiguous courses for the minor are taken in one department, and they are chosen with the advice and approval of a minor adviser in that department.
2. *Project Minor*—A project minor centers on a topic or period chosen by the student. The

project is often interdepartmental and interdisciplinary. The program must have the approval of a minor adviser in the "center-of-gravity" department, who will also be available to assist the student in planning the program for the minor. (Students unable to locate an appropriate faculty adviser should ask the Office of the Revelle Provost for assistance.)

3. *Six Electives Unrelated to the Major*—Under this option, a student is free to elect any six courses for which he or she is qualified, subject only to the constraints that at least three courses be at the upper-division level and that all six courses are noncontiguous to the student's major.

## PASS/NOT PASS GRADING OPTION

1. No more than one-fourth of an undergraduate student's total course units taken at UCSD and counted in satisfaction of degree requirements may be graded on a Pass/Not Pass basis.
2. Courses used to satisfy the noncontiguous minor may be taken on a Pass/Not Pass basis. (Please note: the Departments of Communication, Literature, Philosophy, Sociology, Linguistics, Mathematics, Music, Chinese Studies, Japanese Studies, and Theatre will not



approve courses taken Pass/Not Pass for a *departmental* minor.)

3. Courses taken as electives may be taken on a Pass/Not Pass basis.
4. Courses taken Pass/Not Pass may not be used in satisfaction of any lower-division Revelle College breadth requirements except fine arts and language.
5. Upper-division courses to be counted toward a departmental major may not be taken on a Pass/Not Pass basis. Individual departments and/or advisers may authorize exceptions to this regulation.

### **THE GRADUATION REQUIREMENTS**

In order to graduate from Revelle College, a student must:

1. Satisfy the University of California requirements in Subject A and American History and Institutions.
2. Satisfy the general-education requirements.
3. Successfully complete a major consisting of at least twelve upper-division courses as stipulated by the department.
4. Complete six noncontiguous courses (at least three must be upper-division).
5. Pass at least 184 units for the B.A./B.S. degree. No more than 3.0 units of physical education, whether earned at UCSD or transferred from another institution, may be counted towards graduation.
6. Attain a C average (2.0) or better in all work attempted at the University of California (exclusive of University Extension). Departments may require a C average in all upper-division courses used for the major and/or at least C — grades in each course used for the major.
7. Meet the senior residence requirement. (See "Academic Regulations: Senior Residence.")

Upon satisfaction of the graduation requirements, Revelle College will recommend that the student be awarded the bachelor of arts degree or the bachelor of science degree in physics, cognitive science, chemistry, or in designated engineering programs.

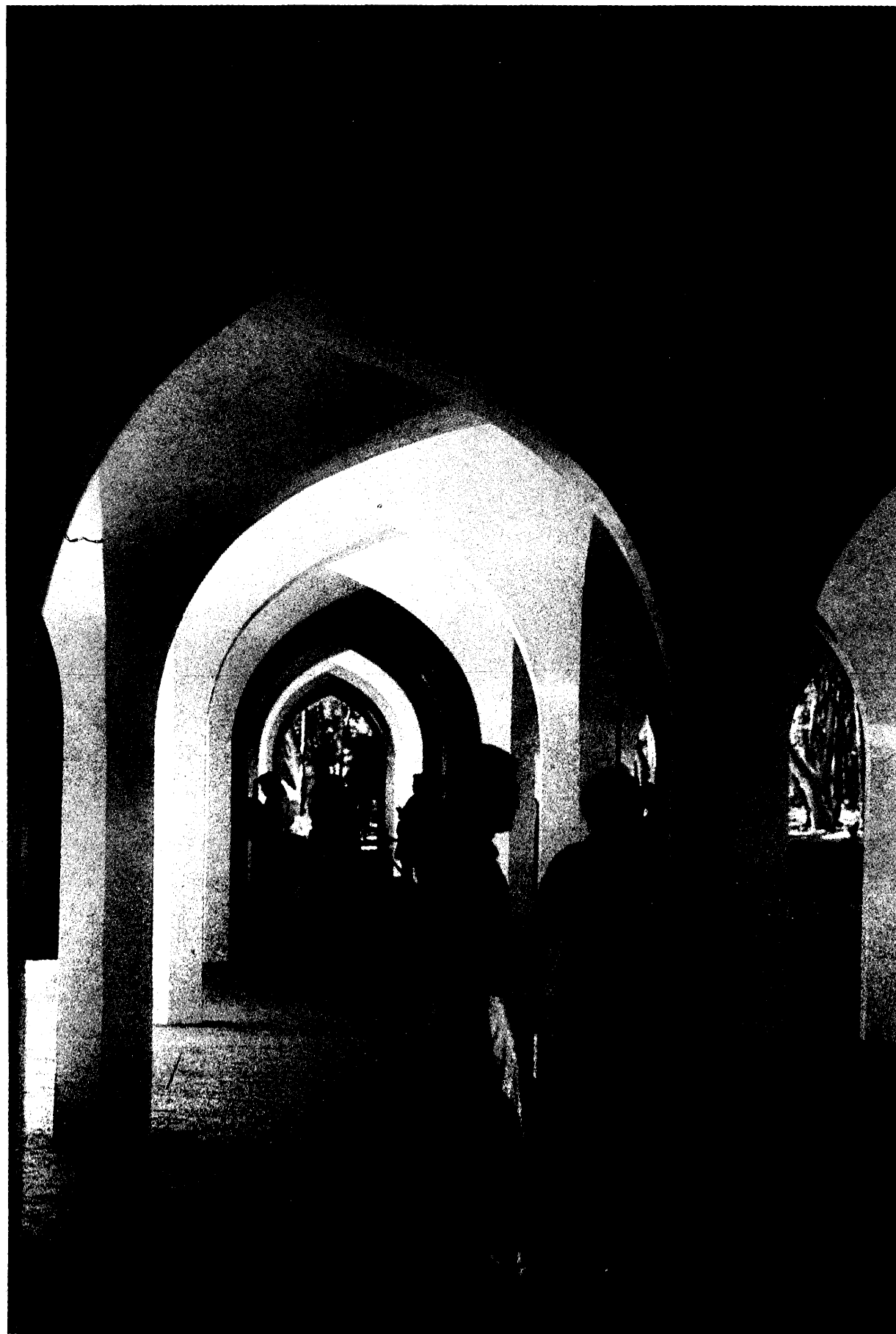
### **HONORS**

Particularly well-prepared students are invited to join the Freshman Honors Program. Students not eligible at admission will be invited to join the Freshman Honors Program upon obtaining a 3.7 GPA with at least four-

teen graded units during their first quarter. The program includes weekly participation in small faculty seminars, additional free computer time, guaranteed on-campus housing for four years, and a variety of other perquisites. Outstanding students are individually advised to join honors classes in chemistry, mathematics, and social science.

Quarterly provost's honors, honors at graduation, departmental honors, and Phi Beta

Kappa honors are awarded. At least five outstanding graduating seniors are honored at graduation each year with a monetary honorarium. An honors banquet is given for the top one hundred students in Revelle each spring. Seniors are selected for participation in honors seminars. For additional information, see "Revelle Honors Program" and "Honors" in the index.



# JOHN MUIR COLLEGE

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John Muir College admitted its first students in the fall of 1967 and moved to its present quarters in 1970. The college was named for John Muir (1838-1914), a Scottish immigrant who became a famous California naturalist, conservationist, and author. Muir explored the Sierra Nevada and Alaska, and worked for many years for the cause of conservation and the establishment of national parks and forests.

## ***THE CHARACTER OF THE COLLEGE***

Naming a college affirms certain ideas and values. John Muir was committed to learning, self-sufficiency, and the betterment of humankind. Throughout his life he was open to new ideas and experiences which he shared with others through his many books. In keeping with his example, the college has, through its interdisciplinary studies programs, developed courses covering such areas as contemporary issues and environmental studies. It has established an individualized major called the Muir Special Project. And it has inaugurated an exchange program with Dartmouth College, one of the most distinguished undergraduate institutions in the United States. Each quarter fifteen UCSD students, the majority of them from Muir, attend Dartmouth, while a similar number come from Dartmouth to Muir. By these and other means, the college maintains at UCSD the heritage of the remarkable man for whom it was named.

## ***THE GENERAL-EDUCATION REQUIREMENTS***

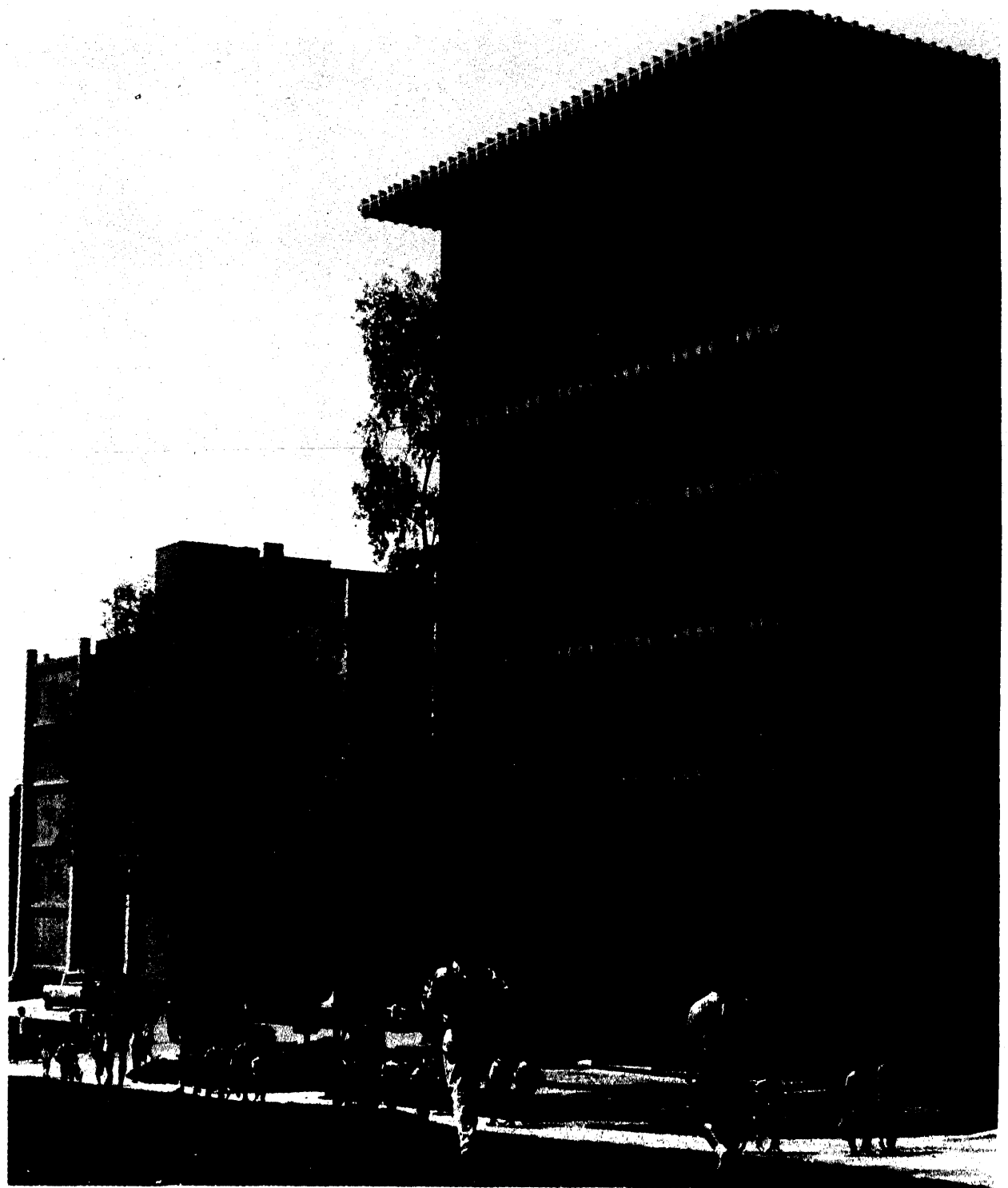
The general-education program was established by the faculty of John Muir College to guide students toward a broad and liberal education while allowing them substantial choice in the development of that education. In addition to two expository-writing courses, students must select year-long sequences (three courses in the same department) from four different academic areas. One of the sequences must be from the social sciences area, the second from the natural sciences *or* mathematics (calculus), and the remaining two sequences from the humanities, fine arts, or for-

eign languages. Students choose sequences from several alternatives. It should be understood that this freedom carries with it certain responsibilities on the part of the student for careful planning. Some of these are:

1. Students should request from the advising unit of the Office of the Provost a list of general-education requirements before making their final selection of courses.
2. Only complete sequences may be applied to the general-education requirement. Ordinarily an entire sequence from one department is taken in one academic year.

3. Courses taken to satisfy only the general-education requirements may, in general, be taken for a letter grade or Pass/Not Pass.
4. Units obtained from advanced placement may be applied toward the 180 units needed for graduation; such units may be used to fulfill partially the general-education requirements.

For students who transfer to Muir College from another institution, the general-education requirements will be interpreted in this way: two semester-courses or three quarter-courses in one subject represented on the approved list



normally will be accepted as completing one of the four required sequences. After the Office of Admissions evaluates a student's transcript, the advising unit of the Office of the Provost makes an evaluation of prior work for each student at the time of his or her first enrollment.

### **PASS/NOT PASS GRADING OPTION**

Muir students are reminded that to take a course Pass/Not Pass, they must be in good standing (2.0 GPA). No more than one-fourth of an undergraduate student's total UCSD course units counted in satisfaction of degree requirements may be in courses taken on a Pass/Not Pass basis (including P.E. courses). *A maximum of three units of physical education credit may be applied to the B.A. or B.S. degree.*

### **MAJOR PROGRAMS AND SPECIAL PROJECTS**

Almost all of the major programs at UCSD have a pattern of prerequisites, some of them quite extensive. Students must declare a major upon accumulating ninety units. Students who do not plan well could find, in their junior year, that they have access to few majors without doing additional lower-division work. With careful planning, they may have access to a wide range of majors. Muir College students are encouraged to consult regularly with the academic advisers of the Office of the Provost as well as with their major department advisers concerning the selection of appropriate courses so as to graduate by the 200 maximum unit limitation.

Each academic department has, in its section of this catalog, a paragraph entitled "The Major Program." Students are encouraged to read these sections carefully, for they indicate both the extent and the nature of the upper-division program. The following points are useful to keep in mind:

1. A substantial command of at least one foreign language is required by some departments (e.g., linguistics, literature).
2. Specific science courses are required by many departments. For example, the Department of Computer Science and Engineering and the Department of Electrical and Computer Engineering require Physics 2A-B-C-D or Physics 4A-B-C-D-E; the Department of



Chemistry requires Physics 1A-B-C, Physics 2A-B-D, or Physics 4A-B-C-D-E.

3. The physical and life sciences, applied sciences (the Departments of Computer Science and Engineering, Electrical and Computer Engineering, and Applied Mechanics and Engineering Sciences) together with certain social sciences (including economics), require at least one year of calculus.

The Muir Special Project major is intended for students who have specific talents and interests which are not accommodated by one of

the departmental majors. The MSP normally includes regular course work and independent study (representing up to fifteen four-unit courses) as well as a project or thesis. The project may be one of two kinds: creative work of some sort (e.g., a book of poetry, a collection of musical compositions), or a detailed program of study and research in a particular area. The latter results in a long paper representing a synthesis of knowledge and skill acquired. In either case, a regular member of the faculty must serve as an adviser to a student doing the project. It should be understood that



the demands of a special project major are great, and a project is not appropriate for a student who simply does not want the discipline of a normal major. For a course to be included as part of a Muir Special Project, the student must earn in it a grade of C — or better. Further information may be obtained from the Muir Academic Advising Office.

## GRADUATION REQUIREMENTS

To receive a degree of bachelor of arts or bachelor of science a John Muir College student must:

1. Declare graduation by obtaining, completing, and returning the Degree and Diploma Application form to the Academic Advising Office. This must be done by **Friday of the ninth week of the quarter preceding the quarter of anticipated graduation.** Students who plan to graduate at the end of a summer session must complete the above-mentioned process by the **Friday of the second week of spring quarter.** Fees may be assessed if students miss these deadlines.
2. Meet the general university requirement in Subject A, English Composition. (See "Undergraduate Admissions, Policies and Procedures.")
3. Satisfy the University of California requirement in American History and Institutions (See "Undergraduate Admissions, Policies and Procedures.")
4. Meet the Muir College requirement in writing proficiency. This requirement asks that the student demonstrate an ability to write English according to standards appropriate for all college work. (See Muir College course listings: "The Writing Program.")
5. Fulfill the general-education requirements.
6. Complete required units. Students with B.A. degrees must pass forty-five four-unit (180 units) academic courses or their equivalent. Eighteen of the forty-five courses (72 units) must be upper-division level. Students with B.S. degrees in arts/science such as biology, chemistry, and physics or cognitive science may graduate with 180 units of which seventy-two are upper-division. Students with B.S. degrees in engineering must have at least 192 units with a minimum of eighteen upper-division four-unit courses.
7. Show some form of concentration and focus of study. Ordinarily this is accomplished

by completing a department major. Students in the college may attempt any major upon completion of the prerequisites. (Presently, the Departments of AMES, CSE, ECE, and Mathematics-computer science require students to attain a minimum GPA in prerequisite courses and apply for admission to majors in the departments.) Students who do not choose to meet this requirement by means of a departmental or interdisciplinary major may complete a special project major. As the name implies, this is a specialized form of concentration. It normally consists of a combination of regular course work, independent study, and a project. Each project must be approved by the provost. (See the section, "Major Programs and Special Projects," above.)

8. Satisfy the residency requirement which stipulates that nine of the last eleven courses passed be taken at UCSD as a registered Muir College student. Students planning to study abroad during the senior year should be aware that they must return to complete a minimum number of twenty-four units at UCSD. Such students should see their college adviser for clarification.
9. Accumulate a grade-point average of at least 2.0 overall *and* in the major. Departments may require a C average in all upper-division courses used for the major or C — grades in each course used for the major. Students on "probation" or "subject to dismissal" in their last quarter will not be eligible for graduation.
10. *Make up all incomplete grades. Students may not graduate with "NRs", "IPs", or "Incomplete" entries on their transcript.* Therefore, they should be sure that all Incompletes have been cleared and final grades have been properly recorded by the end of the quarter in which they plan to graduate.
11. Complete all requirements for the degree during the quarter in which students file to graduate. If the degree requirements are completed after the expiration of the deadline in a quarter, but before the beginning of the next quarter, students must refile to graduate for the subsequent quarter. **Degrees are not automatically granted; students must file their intention to graduate.**
12. Refile the Degree and Diploma Application form if unable to satisfy all graduation requirements, including grade changes, by the end of the proposed graduating quarter. Stu-

dents will graduate at the end of the quarter in which deficiencies are satisfied.

13. It is the students' responsibility to contact their department adviser to verify that they have satisfied departmental requirements for graduation.

While John Muir College does not call for the completion of a minor to fulfill its requirements for the degree of bachelor of arts or bachelor of science, it does acknowledge such completion of an approved departmental minor on a student's transcript. **No courses may be used to satisfy both a major and a minor.** At least three of the six courses must be upper-division. Only one of the lower-division classes may be taken P/NP. Among upper-division classes, only a 198 or 199 may be taken P/NP.

Upon satisfaction of the graduation requirements, Muir College will recommend that the students be awarded the degree of bachelor of arts or bachelor of science (at least 180 units, of which at least 72 must be upper-division).

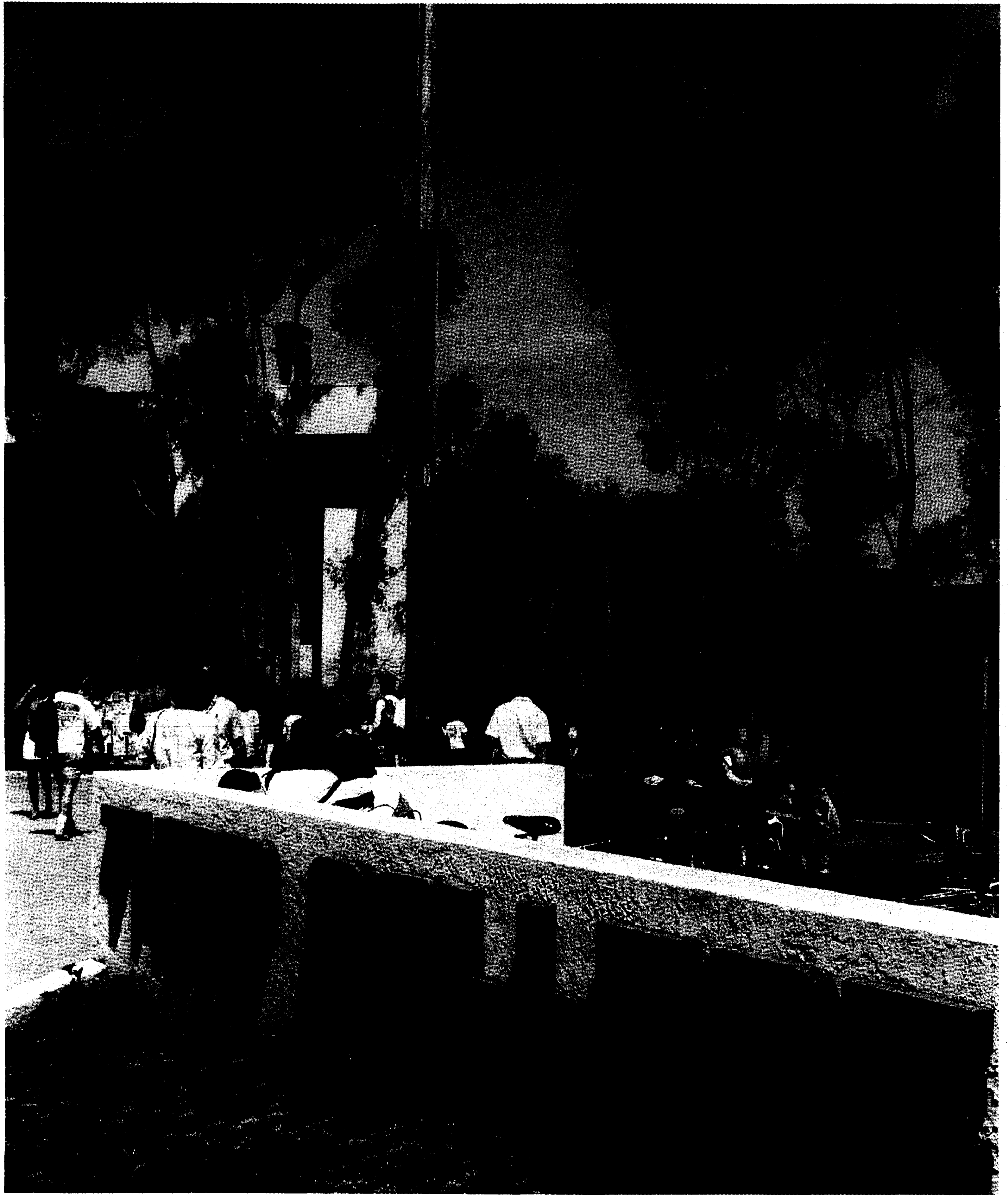
## HONORS

Quarterly provost's honors, departmental honors, college honors, membership in the Caledonian Society of John Muir College, and Phi Beta Kappa honors are awarded. **Please note that graduating seniors must have letter grades for eighty units of work completed at the University of California for college honors.** For additional information, see "Honors" in the Index.

## HONORARY FELLOWS OF MUIR COLLEGE

- Hannes Alfvén, Scientist and Nobel laureate  
 \*Georg von Bekesy, Psychologist and Nobel laureate  
 Oscar (Budd) Boetticher, Filmmaker  
 David Brower, Conservationist  
 Francis H.C. Crick, Scientist and Nobel laureate  
 \*Ernst Krenek, Composer  
 \*Ernest Mandeville, Philanthropist  
 William J. McGill, Educator  
 Jonas Salk, Scientist  
 Claude E. Shannon, Mathematician  
 John L. Stewart, Founding Provost  
 \*Earl Warren, Jurist and Statesman  
 \*Robert Penn Warren, Poet and Novelist  
 Mandell Weiss, Philanthropist

\*Deceased



# THIRD COLLEGE

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Third College, founded in 1970, is a liberal arts and sciences college dedicated to the development of the scholar and citizen. Students pursue majors in the social sciences, natural and physical sciences, mathematics, engineering, humanities, and fine arts. The primary goal and responsibility of the college is to provide its students with a rigorous academic curriculum. Third College has a rich tradition of sponsoring academic programs in comparative cultures, ethnic studies, urban studies and planning, science and technology, teacher education, communication, and Third World studies.

The college's educational philosophy is guided by the belief that regardless of a student's major, a broad liberal arts education must include an awareness and understanding of the diversity of cultures and the variety of ways culture enables people to fashion lives of dignity. Therefore, the distinctive general-education requirements have a rich tradition of emphasizing a critical examination of the human condition in a multicultural society.

The three-quarter core sequence, "Dimensions of Culture—Diversity, Justice and Imagination" is designed as an interdisciplinary, issues-oriented curricular experience that seeks to balance an exploration of uniquely American, Western, and non-Western culture. Students are also required to complete courses in mathematics, natural/physical sciences, writing, humanities, and fine arts.

In addition to the strong academic program, Third College is proud of its emphasis on the student as citizen. The Student Leadership Program is especially designed to encourage active participation in the governance of the college and community public service.

Throughout its history, Third College has been, and continues to be, educationally innovative. The first hands-on computer class at UCSD was sponsored by Third College. In the early 1970s, Third College initiated a science and technology program to invigorate the teaching of science to nonscience majors. Courses introduced by that program serve all UCSD students today. Among the UCSD colleges, Third College pioneered self-paced studies in mathematics and initiated the Academic Honors Program for first-year students

who are admitted with a GPA of 3.8 or better, and mathematics and verbal SAT scores of 650 or better in each area, and for entering transfer students with a GPA of 3.8 or higher.

Within such programs as Urban Studies and Planning and the Teacher Education Program, Third College pioneered field placement and internship programs to provide students opportunities to apply their knowledge to real world situations. In addition, Third College sponsors a number of activities which direct the intellectual resources of the university to matters of public importance and interest.

Third College provides a distinctive academic focus on social change and development in the modern world. The college poses such questions as: What should count as "progress"? How is it achieved? A full understanding of contemporary social problems typically requires a knowledge of their history, an appreciation of their cultural dimension, and analysis by means of the precise tools of the social and natural sciences. Third College is committed to the scholarly investigation of those factors which determine the quality of life in Western and non-Western countries.

College life outside the classroom and laboratory is a vital part of each student's undergraduate experience. Third College offers a variety of opportunities for students to shape the nature and character of student life at UCSD. Through active participation, Third College students develop maturity, self-confidence, and strong interpersonal, organizational, and leadership skills.

The Third College educational philosophy is founded on the belief that the best preparation for a complex, independent, and rapidly changing world is a broad liberal arts education, complemented by in-depth study in the areas of the students' choice based upon individual interests and career goals. This educational approach has several major advantages for students:

1. It guarantees a basic understanding of the principal branches of knowledge: the humanities and arts, social sciences, the natural sciences, and mathematics.
2. It enables students with well-defined major interests and career goals to begin work on their majors as first-year students.

3. It allows students who have not decided on a major to sample an array of potential majors while simultaneously satisfying the general-education requirements of the college.

This educational philosophy finds further expression in our collegiate advising and counseling systems, which enable students to derive full benefit from the rich and diversified academic programs at UCSD.

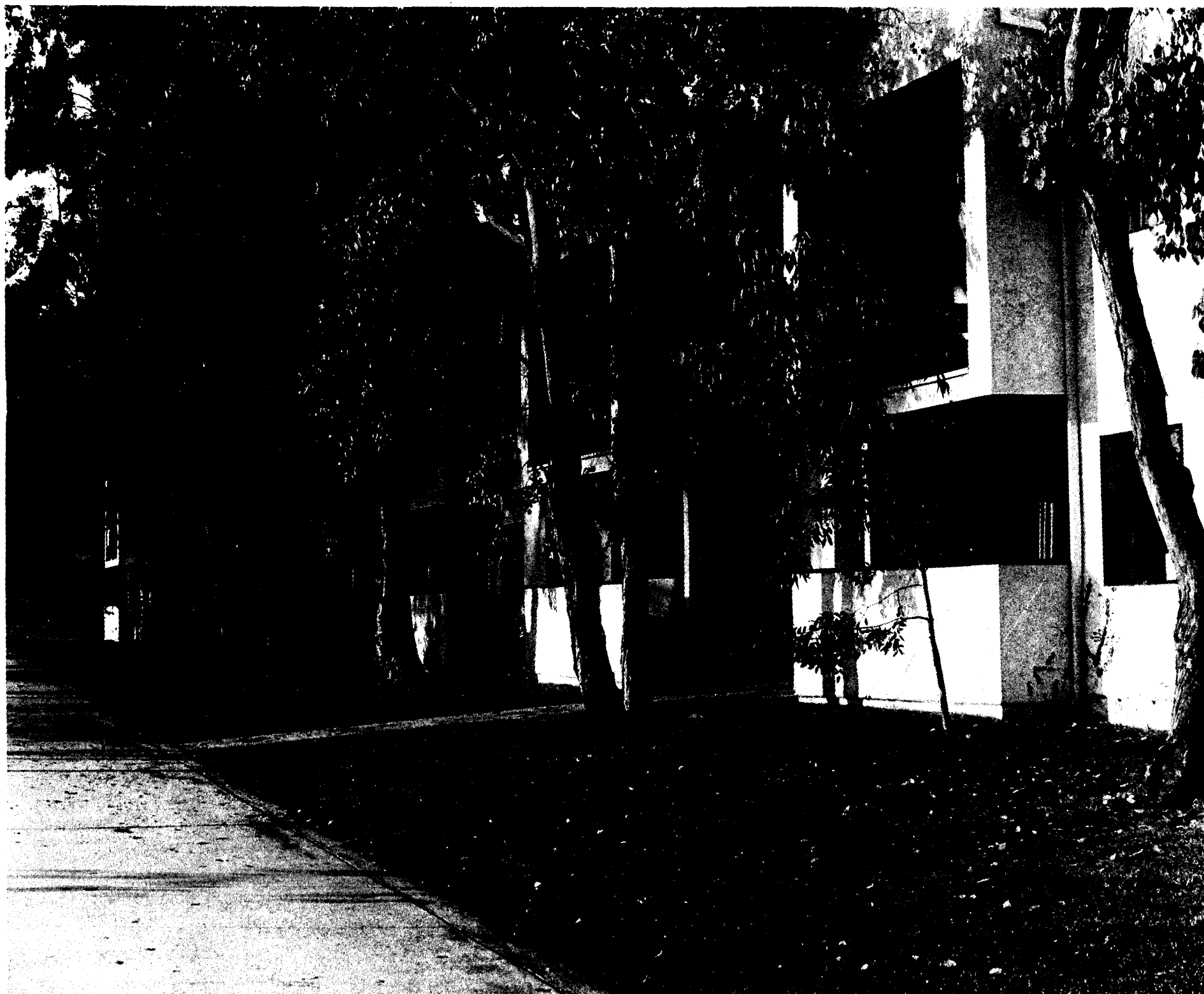
It is fundamental to the philosophy of Third College that students, faculty, and staff constitute an intellectual community joined in the task of mutual learning. This aspect of the college philosophy is reflected in the participation of students in faculty research projects, public service, student leadership, and the Convocation Series.

## **GENERAL-EDUCATION REQUIREMENTS**

General-education requirements are established by the Third College faculty. These requirements are designed to introduce students to the academic focus of Third College, provide a broad liberal arts and science background, and furnish students with the academic skills and the basic knowledge necessary to pursue any departmental or interdisciplinary major.

The general-education requirements are as follows:

1. **DIMENSIONS OF CULTURE:** This three-course interdisciplinary sequence is entitled "Diversity, Justice and Imagination." Two of the three courses are six-units, and include intensive instruction in university-level writing. This is a required sequence for all first-year students. All courses must be completed at UCSD and taken on a letter-grade basis only. Students must also attend a quarterly convocation series. (See "Dimensions of Culture" in the departmental listings.)
2. **NATURAL SCIENCES:** Three courses. One course each in biology, chemistry, and physics.
3. **MATHEMATICS AND LOGIC:** Two courses in mathematics or one course in mathematics and one in computing.



4. HUMANITIES AND CULTURE: Two courses. One course each from ethnic studies and Third World studies.

5. DISCIPLINARY BREADTH: Four courses. Students must complete **four** courses (**three** for students graduating with a B.S. degree in engineering) requiring disciplinary breadth. The disciplinary breadth areas include: humanities/foreign language; social sciences; natural sciences; math/engineering. Courses used to satisfy the disciplinary breadth requirement must come from fields noncontiguous to the major field of study. Two of these courses must be upper-division. At least one upper-division course must include significant writing.

6. FINE ARTS: One course in either music, theatre, or visual arts.

7. PUBLIC SERVICE (optional): This four-unit public service option can be used to fulfill one course in Disciplinary Breadth.

The Third College Curriculum and Academic Affairs Committee publishes an annual fact sheet which lists specific courses which may be used to meet these requirements. Contact the college's academic advising office for additional information.

### **GRADUATION REQUIREMENTS**

To receive a bachelor's degree from Third College, a student must:

1. Satisfy the university Subject A requirement. (See "Undergraduate Admissions, Policies and Procedures.")
2. Satisfy the university requirement in American History and Institutions. (See "Undergraduate Admissions, Policies and Procedures.")
3. Fulfill the general-education requirements as described.
4. Complete a departmental or interdisciplinary major.

5. Satisfy the college residency requirement (thirty-six of the last forty-five units must be completed as a registered Third College student).
6. Successfully complete a minimum of 180 units for the B.A./B.S. degree. At least 60 of these units must be completed at the upper-division level. All students must complete a minimum of fifteen four-unit upper-division courses.
7. A 2.0 or better GPA is required for graduation.

### **MAJORS AND MINORS**

**Majors:** Third College students may pursue any of the departmental or interdisciplinary majors offered at UCSD. The majority of the academic departments have established lower-division prerequisites. Generally, these prerequisites must be completed prior to entry into upper-division major courses. Students are strongly encouraged to work closely with department faculty advisers and college counselors. For details on the specific major departments, refer to the "Courses, Curricula, and Programs of Instruction" section of this catalog.

**Minors** are optional at Third College. However, students are encouraged to keep as many options open as possible. A minor provides an excellent opportunity to complement the major field of study. A minor consists of six courses or twenty-four units of interrelated course work. A minimum of three upper-division courses must be completed. Only one upper-division course may be taken on a Pass/Not Pass basis. The upper-division courses may not overlap with the major. The department or program may establish more stringent criteria than the minimum established by the college. A formal request for the minor must be approved by the end of the junior year. Petitions are available in the academic advising office.

### **PASS/NOT PASS GRADING OPTION**

1. Courses to be counted toward a departmental major or as prerequisites to the major must be taken on a letter-grade basis.
2. Only one upper-division course to be counted toward a minor may be taken on a Pass/Not Pass basis.
3. Courses taken toward completion of the Third College general-education requirements,

with the exception of Dimensions of Culture (Diversity, Justice and Imagination), may be taken on a Pass/Not Pass basis, while at the same time the restrictions for prerequisites to majors and courses counted toward a minor must be observed.

4. Courses taken as electives may be taken on a Pass/Not Pass basis, while at the same time the restrictions on the majors and minors must be observed.

5. No more than one-fourth of the total University of California, San Diego units may be completed on a Pass/Not Pass basis, including physical education courses.

### **HONORS**

Quarterly provost's honors, honors at graduation, departmental honors, and Phi Beta Kappa are awarded to Third College students. For additional information see "Honors" in the Index or consult with the Academic Honors Program adviser, in the academic advising office.

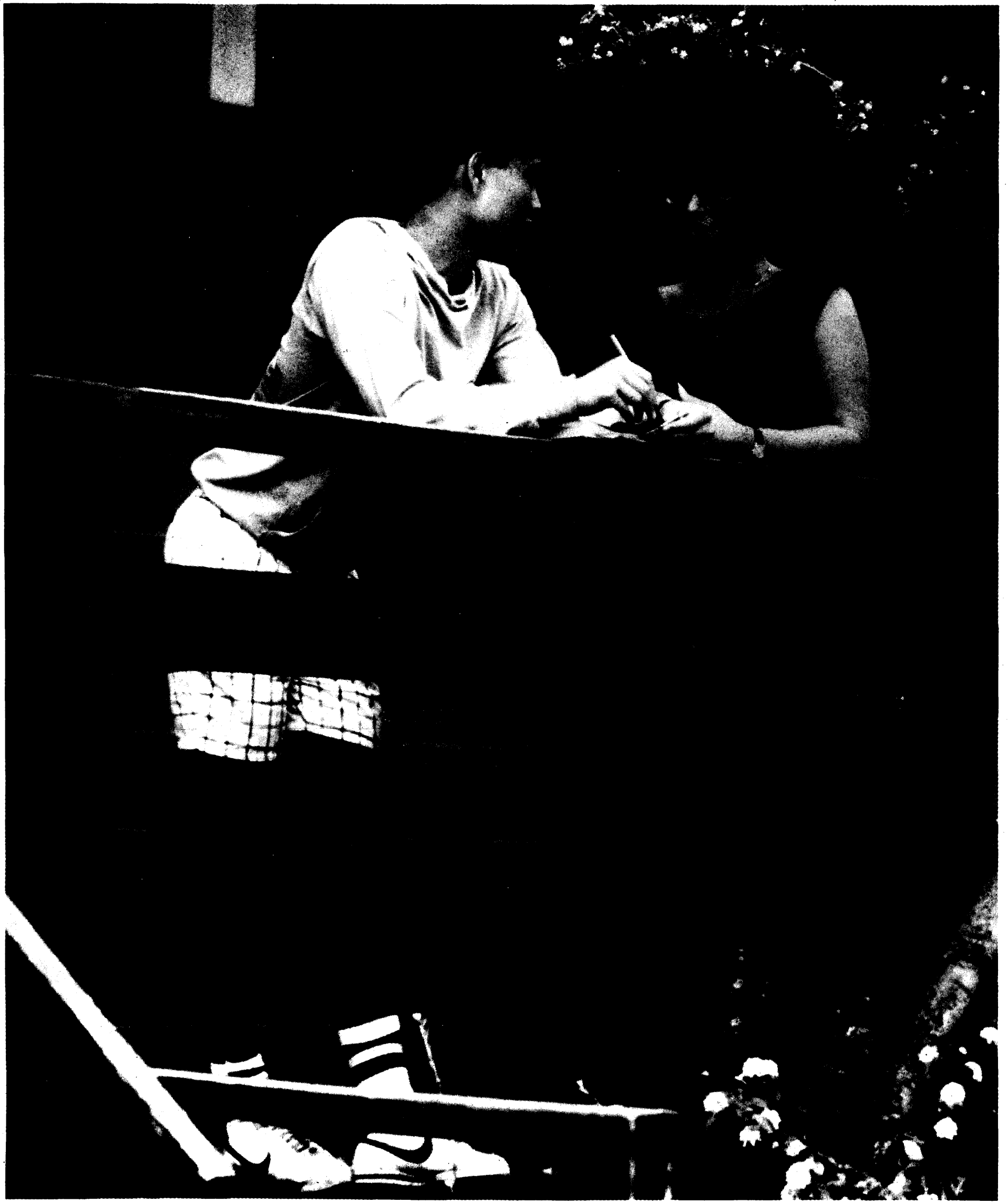
### **UCSD-MOREHOUSE/ SPELMAN STUDENT EXCHANGE PROGRAM**

The UCSD-Morehouse/Spelman Student Exchange Program was established in the fall quarter of 1989. This formal exchange program was developed by Third College, and is open to all UCSD undergraduates. Morehouse and Spelman colleges are located in Atlanta, Georgia.

The purpose of the program is to provide a unique opportunity for students to live and study at important institutions of higher learning that are significantly different from the social and educational environment typical of California state colleges and universities. Similarly, the exchange students coming to UCSD from Morehouse and Spelman will have an opportunity to experience an exciting and very different educational environment. See Third College academic advising for additional information.

### **HONORARY FELLOW OF THE COLLEGE**

Ernesto Galarza, Novelist and Educator





# EARL WARREN COLLEGE

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Earl Warren College opened in the fall of 1974, and currently enrolls 3,500 students. The college is named after Earl Warren, former chief justice of the United States Supreme Court and the only three-term governor of California. Mr. Warren, a native Californian, earned his college and law school degrees at the University of California (B.L. 1912; J.D. 1914). During his governorship, he was an ex-officio member of the UC Board of Regents for eleven years. Mr. Warren also saw public service as district attorney of Alameda County, and as attorney general of California.

As governor during an era of lightning growth for California, he developed the State Department of Mental Hygiene, and led in reforms of the prison system in California by establishing the Board of Corrections and the Prisoner Rehabilitation Act. In his final role as a public servant, Mr. Warren was chief justice of the United States Supreme Court, which under his leadership elaborated a doctrine of fairness in such areas as criminal justice, voting rights, legislative districting, employment, housing, transportation, and education.

Earl Warren College is committed to preparing its students for an active role in society in their postbaccalaureate years. Whether students wish to continue their education in graduate or professional school, to seek an immediate career or to pursue other options, the college stands ready to assist. Students are encouraged to identify their abilities and interests, examine career possibilities, and prepare for the future.

The college's students and faculty represent all disciplines offered at UCSD. Graduation requirements, which consist predominantly of one major and two secondary areas of study, enable a student to develop a program covering a wide range of material while also focusing on particular areas in depth. The diversity of its academic program has made Warren College an exciting home for students who seek maximum flexibility in designing their own education.

## **GENERAL-EDUCATION REQUIREMENTS**

Warren College faculty has a firm conviction that each student should have the oppor-



tunity to develop a program best suited to his or her individual interests, but within a framework that ensures both depth and breadth of study. All students are required to have a significant exposure to the humanities and fine arts, the social sciences, and the natural sciences. The faculty and staff of the college provide extensive advising on individual academic programs and their possible career implications. Warren College students work within the following academic plan:

1. Each student must complete a two-course sequence in writing. Warren College 10A-B, the required writing sequence, *must* be taken immediately following completion of the Subject A requirement. The courses aim primarily to help the student develop an authentic voice in writing and an increasingly conscious control of language. The sequence moves from free writing through narrative to writing of a structural and critical complexity comparable to that of the college essay. Classes are small and are taught in workshop style, devoting most of their time to the discussion of student papers.
2. The college also requires that all students complete a course titled "Ethics and Society," offered jointly by the political science and philosophy departments (Philosophy 27/Political Science 27). This course *must* be taken by the end of the second year at UCSD.
3. Warren students must also complete a two-course sequence which requires formal or algorithmic reasoning. Subjects that can be taken to satisfy the formal skills requirements are: two courses in calculus, computer science, or symbolic logic. All options must consist of two courses in one area, except computer science and symbolic logic, where a combination is acceptable.
4. To ensure a significant exposure to the three disciplinary areas: humanities/arts, social sciences, and natural sciences, all students are required to complete two focused collections of courses outside the areas of their majors. For all students other than B.S. engineering majors, two **programs of concentration** of six courses each are required. These **programs of concentration** must cover the two disciplinary areas outside the student's major. With some exception, upper-division courses are required in the **programs of concentration**. A few **programs of concentrations** require more than six courses.



For **B.S. engineering majors**, each student must complete an **area study** in the humanities/arts and an **area study** in the social sciences. Each of these **area studies** consists of three courses of which at least one must be in the upper division.

All **programs of concentration** and **area studies** must be approved by Warren College. A brochure entitled "Earl Warren College Programs of Concentration and Area Studies" will be provided to all Warren Students.

### **DOUBLE MAJORS**

Double majors are required to include all three discipline areas in their academic plan. Thus, if the two majors are from different discipline areas, one program of concentration or area study from the third discipline area will be required. If the two majors are from the same discipline area, two programs of concentration or area studies will be required from the two remaining disciplinary areas.

### **PASS/NOT PASS GRADING OPTION**

General-education requirements may be fulfilled by courses taken on the Pass/Not Pass

basis. Warren students are reminded that major requirements and prerequisites must be taken on the graded basis. The total number of Pass/Not Pass units may not exceed one-fourth of a student's total UCSD units toward graduation.

### **GRADUATION REQUIREMENTS**

To receive a **B.A. or B.S. degree** from Warren College a student must:

1. Satisfy the University of California requirements in American History and Institutions, and in Subject A. (See "Undergraduate Admissions, Policies and Procedures.")
2. Fulfill the general-education requirements described above.
3. One course in Cultural Diversity in U.S. Society to be chosen from an approved list.
4. Complete a major chosen from those regularly offered at UCSD. Each department determines the courses and grades required for its major; generally this will include a set of twelve to twenty-two upper-division courses. In addition, most majors require a certain amount of introductory course work, and the beginning student is urged to plan a program that will permit a wide choice of major fields. For example, calculus is required for a significant number of majors; a student who does not take this subject excludes all these majors from further consideration.
5. Students in good academic standing may be permitted to double major. Students must secure approval by petition from the appropriate departmental advisers and the college provost. Students must fulfill the requirements (prerequisites and upper-division courses) of both majors. Additional criteria established by the Academic Senate must also be met.
6. Attain a C average (2.0) or better in all work attempted at the University of California.
7. Satisfy the college residency requirement that thirty-six of the last forty-four units passed (nine of the last eleven courses) must be taken as a student in the college.
8. Pass a minimum of forty-five four-unit academic courses or their equivalent (180 units). At least fifteen four-unit courses (60 units) must be successfully completed at the upper-division level. No more than 3 units of physical education (activity), whether earned at UCSD or elsewhere, may be used towards degree requirements.



**TRANSFER STUDENTS**

For students who have completed their lower-division general-education requirements at an accredited four-year college and for students who have completed a systemwide or campuswide approved core curriculum in a California community college prior to entering UCSD, the only additional general-education requirements are two upper-division courses noncontiguous to the discipline area of the major and graduation requirement 3 is waived. All other transfer students must complete the same general-education requirements above.

**THE WARREN COLLEGE SCHOLARS PROGRAM**

The Warren College Scholars Program is an honors program for students with a broad range of interests and with a history of outstanding scholastic achievement. It offers the scholar an opportunity to work closely with the faculty throughout his or her academic ca-

reer at UCSD. High school seniors with a 3.8 GPA and an SAT score of 650 in verbal and 650 in mathematics or above are automatically eligible for admission to the program. Other students with strong academic credentials may also apply. (For more information, see "Warren College" in the section "Courses, Curricula, and Programs of Instruction.")

**ACADEMIC INTERNSHIP**

Warren College administers an Academic Internship Program available to students from all five colleges. The program is based on the conviction that quality education results from a combination of classroom theory and practical experience. Participants work full- or part-time for a public or private organization. Placements match students' major areas of academic study and correlate with their career goals. Students may enroll in the program for a maximum of sixteen units in increments of four, eight, or twelve units per quarter. Although most placements are in the San Diego

area, the Academic Internship Program is national in scope and varied in offerings. Students might work for a senator in Washington; a legal-aid office in Los Angeles; a business, a T.V. station, research lab or social service agency in San Diego; or any number of other possibilities. Working closely with faculty advisers, students write research papers that integrate their academic backgrounds and internship experience. For more information, see listing under "Academic Internship."

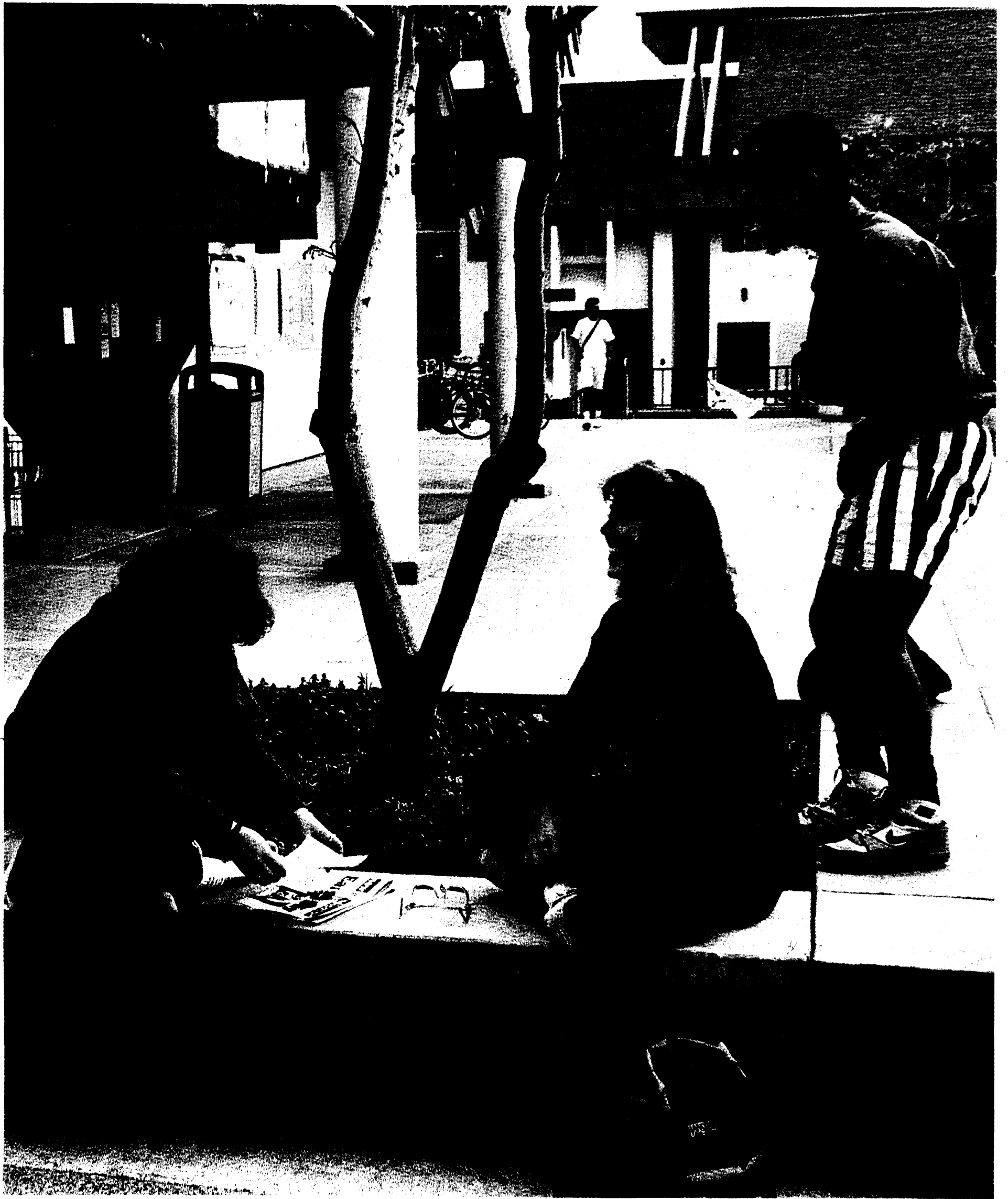
**HONORS**

Quarterly provost's honors, honors at graduation, departmental honors, and Phi Beta Kappa honors are awarded. For additional information see "Honors" in the Index.

**HONORARY FELLOW OF THE COLLEGE**

Harry N. Scheiber, Historian





The newest member of UCSD's family of undergraduate colleges, Fifth College has established itself as the campus's "international" college. In developing an academic plan for the college, Fifth College faculty were guided by the conviction that a global perspective is essential to informed participation in our contemporary world. The resulting general-education curriculum, while including basic studies in a broad range of disciplines, offers students an especially strong background in international studies, comparative culture, and foreign language. Every Fifth College student will study at least one foreign language at the university level. In the freshman and sophomore years, students will examine a number of Western and non-Western cultures historically and comparatively. In the junior and senior years, in addition to concentrating on work in the major field, students will choose a single geographic area to study in depth. Although study abroad is not required, students will be strongly encouraged to study or to complete a career-related internship in another country during the undergraduate years.

The college's international focus is designed to complement and to enhance learning in any major that a student might choose. Students seeking careers in fields as diverse as business, public policy, engineering, and the arts will find Fifth College's international perspective equally valuable.

All aspects of student life at Fifth College reflect the college's international emphasis. Residence life programs range from international meals to informal sessions on global issues. Undergraduates will live in the residence halls, and many resident advisers will be upper-division students who have studied overseas. Students living both on and off campus will have opportunities to participate in such activities as international fashion shows, foreign films, field trips, folk dancing, and celebrating "national days" of other countries. The International House located nearby also will sponsor a variety of activities that will be of great interest to students who seek to broaden their perspective on the world.



## GENERAL-EDUCATION REQUIREMENTS

General-education requirements are established by the Fifth College faculty in order to ensure that students acquire a solid background in liberal arts and sciences, as well as special exposure to international studies. The faculty and staff of the college offer both group and individual advising on academic options and their career implications. Students are particularly encouraged to consult an academic adviser in the Fifth College Provost's Office to initiate plans for an overseas study or internship experience.

The schedule grid below shows a model program leading to completion of most general-education requirements during the lower-division years. Variations will occur, of course, depending upon the student's academic preparation, choice of major, and individual interests and priorities. Students are strongly

urged, however, to adhere to this program as closely as possible in order to assure timely completion of all requirements for graduation.

The general-education requirements are:

- 1. The Making of the Modern World:** A six-course interdisciplinary sequence to be taken in the freshman and sophomore years. The sequence will examine both Western and non-Western cultures historically and comparatively. All courses in the sequence may be taken for a letter grade only. Four of the quarters carry four units of credit. Two of them, to be taken in winter and spring of the freshman year, carry six units, with intensive instruction in university-level writing. Written work is also required in the remaining four courses. For detailed course descriptions, see "The Making of the Modern World" in departmental listings.
- 2. Foreign Language:** Three courses in a single language other than the student's native language. Students who can demonstrate they are biliterate by performance on a special examination may fulfill this requirement by completing two courses in a single foreign language.
- 3. Fine Arts:** Two courses, to include study of both Western and non-Western music, theatre, and/or visual arts. Please consult the Fifth College Provost's Office for more information on this requirement.
- 4. Mathematics/Computer Science:** Two courses to be chosen from offerings in pre-calculus, calculus, statistics, symbolic logic, and computer sciences. Consult the Provost's Office for a list of acceptable courses.
- 5. Natural Sciences:** Two courses to be chosen from those offered by the Departments of Biology, Chemistry, Physics, and/or Earth Sciences.
- 6. Regional Specialization:** Three courses dealing with a single geographic region. Areas of specialization, as established by the college, are designed to be broad enough to ensure course availability but narrow enough to ensure coherence of subject matter. Courses may be chosen from a wide variety of offerings in humanities, social sciences, and fine arts. At least two of the three courses required must be taken at the upper-division level. Consult the Provost's Office for a list of regional specialization areas and courses. (See

## FIFTH COLLEGE

*Minors* below regarding application of regional specialization course work to completion of an optional minor.)

**7. Upper-Division Writing:** At least one upper-division course in each student's program must include a significant writing component (3,000 words or twelve to fifteen double-spaced pages). Courses used to meet the upper-division writing requirement may also be used to meet other general-education, major, or graduation requirements. Consult the Provost's Office for more information on this requirement.

FALL	WINTER	SPRING
<b>FRESHMAN YEAR</b>		
Making/Modern World 1	Making/Modern World 2	Making/Modern World 3
foreign language	foreign language	foreign language
math/computer science	math/computer science	elective fine arts
Subject A or elective	fine arts	
<b>SOPHOMORE YEAR</b>		
Making/Modern World 4	Making/Modern World 5	Making/Modern World 6
natural science elective	natural science elective	elective
elective	elective	elective
elective	elective	elective or regional specialization
<b>JUNIOR AND SENIOR YEARS</b>		
regional specialization (total of three courses, of which at least two must be upper-division)		
upper-division writing requirement (one course, which may also be applied to another requirement)		
major course work		
electives		

## TRANSFER STUDENTS

Transfer students must take three quarters of "The Making of the Modern World." In consultation with academic advisers from the college each student will determine which three courses shall be used to meet this requirement, although a sequence is recommended. Students who have not met their freshman writing requirement elsewhere must complete it by taking MMW 2 and/or 3 as part of their three-course requirement.

## MAJORS

A Fifth College student may choose any undergraduate major offered at UCSD. (Students may choose to complete more than one major, provided that all Academic Senate regulations concerning double majors are met.) Most majors require the completion of specified "pre-major" or prerequisite courses at the lower-division level before enrolling in upper-division major courses. For some majors, admission to upper-division course work is contingent upon



a satisfactory grade-point average in certain pre-major courses. Students are strongly encouraged to work closely with department faculty advisers as well as college academic advisers to ensure adequate and timely preparation for the major. Depending upon the student's choice of major and level of preparation, graduation within four years or within the minimum number of units required may not be feasible. Each academic department has, in its section of this catalog, a paragraph entitled "The Undergraduate Program." Students are encouraged to read these sections carefully, for they explain both the extent and the nature of the upper-division program.

The Fifth College individual studies major is designed to meet the needs of students who have a definite academic interest for which a suitable major is not offered at UCSD. It normally includes regular course work and independent study representing a minimum of

twelve four-unit courses. A regular member of the faculty must serve as an adviser to the student. For a course to count for the individual studies major, the student must earn in it a grade of C- or better. Further information may be obtained from the Fifth College Academic Advising Office.

## MINORS

Although no minor is required for Fifth College students, completion of a minor can be a significant educational or pre-professional asset. Students who wish to do so may combine foreign language course work with regional specialization course work in a related region to earn an individualized minor in, for example, Russian or Japanese studies. Such minors must conform to Academic Senate policies, including completion of at least six courses (twenty-four units), with at least three courses

(twelve units) at the upper-division level. Upper-division courses applied toward a minor may not be used to meet major requirements. Fifth College students also have the option of completing any other approved campuswide departmental or interdepartmental minor. Students interested in completing a minor should consult an academic adviser in the Provost's Office as early as possible. Minors will be noted on the student's transcript at graduation.

### **GRADUATION REQUIREMENTS**

To receive a bachelor's degree from Fifth College, a student must:

1. Satisfy the university Subject A requirement in English composition. (See "Undergraduate Admissions, Policies and Procedures.")
2. Satisfy the university requirement in American History and Institutions. (See "Undergraduate Admissions, Policies and Procedures.")
3. Fulfill the general-education requirements as described above.
4. Complete an approved departmental or interdepartmental major, meeting all major requirements as specified by the major department or program.
5. Satisfy the senior residency requirement that thirty-six of the final forty-five units passed must be completed as a registered Fifth College student. For more information, see "Academic Regulations: Senior Residence."
6. Complete and pass a minimum of 180 units for the B.A. or B.S. degree. At least 60 of these units must be completed at the upper-division level. (The bachelor of science degree is offered only in certain approved science and engineering majors. See departmental listings for information on degrees offered.) For all students, a grade-point average of at least 2.0 ("C") is required for graduation.

### **PASS/NOT PASS GRADING OPTION**

1. No more than one-fourth of the total University of California, San Diego units may be counted in satisfaction of degree requirements on a Pass/Not Pass basis, including physical education courses.
2. Any elective may be taken on a Pass/Not Pass basis.
3. All courses that meet Fifth College general-education requirements in the following areas

may be taken on a P/NP basis: fine arts, natural science, math/computer science, and the lower-division regional specialization course. All others must be taken for a letter grade.

4. Upper-division courses to be counted toward a departmental major may not be taken on a Pass/Not Pass basis. Individual departments may authorize exceptions to this regulation.

### **STUDY OR INTERNSHIP ABROAD**

All Fifth College students are strongly encouraged to study or to complete a career-related internship in another country. Opportunities for study abroad have increased dramatically in recent years, with possible placement ranging from Western Europe to Thailand. Financial assistance is available. College faculty and staff work closely with campuswide offices, including Education Abroad, Opportunities Abroad, and Academic Internship, to ensure access to a wide variety of international experiences. Students should consult an academic adviser in the Fifth Col-

lege Provost's Office during the freshman or early sophomore year to initiate planning for study or work abroad.

### **HONORS**

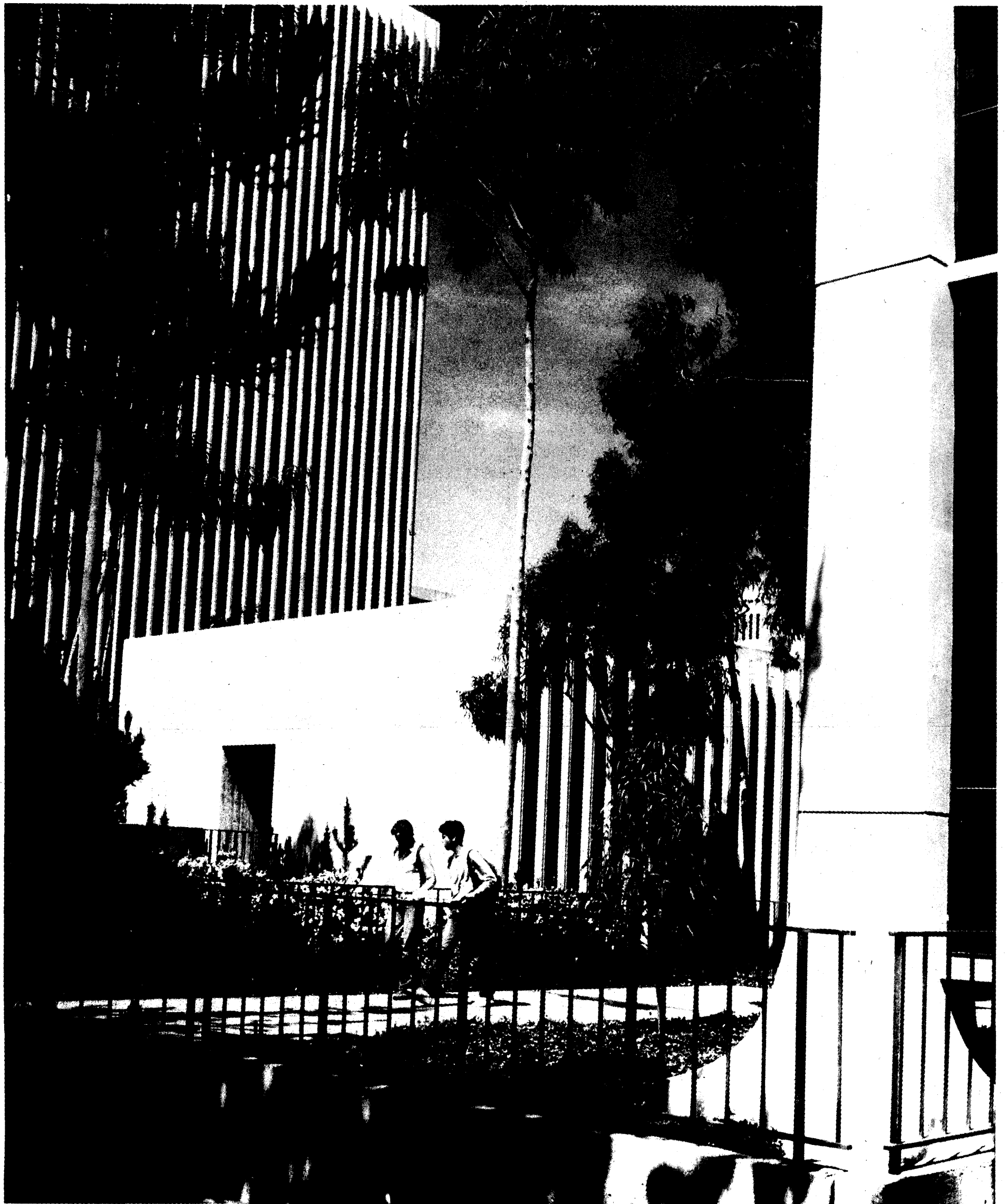
Particularly well-prepared students are invited to join a first-year honors program. In the fall-quarter seminar students meet with a different member of the faculty each week. In winter and spring quarters a single faculty or series of faculty explores with students a topic that has international dimensions.

Second-year students with GPAs of 3.5 or higher have the opportunity to pursue independent study with individual faculty. Honors students also receive additional free computer time and opportunities for cultural and social events.

Students who earn provost's honors for a full academic year by maintaining a GPA of 3.5 are awarded certificates of merit by the college. UCSD's reputation for excellence is also reflected in the numbers of students who enroll in departmental senior honors programs and who receive college or university honors or election to Phi Beta Kappa at graduation.







# UNDERGRADUATE ADMISSIONS, POLICIES AND PROCEDURES

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All communications concerning undergraduate admission should be addressed to the Office of Admissions, 0021, University of California, San Diego, La Jolla, California 92093-0021.

## DEFINITIONS

An application to the University of California, San Diego is processed and evaluated as a freshman or transfer, California resident; freshman or transfer, nonresident; or freshman or transfer, international applicant. See definitions below:

### ***AN UNDERGRADUATE APPLICANT***

A student who wishes to complete a program of studies leading to a bachelor of arts or a bachelor of science degree.

### ***A FRESHMAN APPLICANT***

A student who has graduated from high school but who has not enrolled since then in a regular session in any collegiate-level institution. This does not include attendance at a summer session immediately following high school graduation.

### ***A TRANSFER APPLICANT***

A high school graduate who has been a registered student in another college or university or in college-level extension classes other than a summer session immediately following high school graduation. A transfer applicant may not disregard his or her college record and apply for admission as a new freshman.

An undergraduate student can earn transfer credit upon successful completion of college-level work which the university considers consistent with courses it offers. Such credit may be earned either before or after high school graduation. The acceptability of courses for transfer credit is determined by the Office of Admissions.

### ***A NONRESIDENT APPLICANT***

A student who lives outside the state of California and who is required to present a higher scholarship average than is required of California residents to be eligible for admis-

sion to the university, in addition to paying the nonresident tuition fees.

### ***AN INTERNATIONAL APPLICANT***

A student who claims citizenship in another country and has a nonimmigrant visa.

### ***EARLY ADMISSION HONORS***

Through this program, a very few specially qualified students in local high schools are admitted to UCSD. Beginning in the fall, they attend one or two classes at UCSD during their senior year in high school at reduced cost. For additional information call or write:

University of California, San Diego  
Student Outreach and Recruitment, 0037  
9500 Gilman Drive  
La Jolla, California 92093-0037  
(619) 534-4831.

### **EDUCATIONAL OPPORTUNITY PROGRAM/STUDENT AFFIRMATIVE ACTION**

The Educational Opportunity Program (EOP) and the Student Affirmative Action Program (SAA) are admission recruitment and academic support programs established by the university to increase the enrollment of educationally disadvantaged and low-income students. Students are provided with pre-admission counseling, academic and personal support services. EOP eligibility is based on family income level. SAA focuses on underrepresented students who are black, Mexican American, or American Indian, with no consideration of family income or parental educational level.

Services available to EOP and SAA students cover a broad range of needs. Recruitment, admission, and application-related services include visits to high schools and community colleges, pre-admission counseling, application fee waivers, application follow-up, deferral of the Statement of Intention to Register fee (EOP only), special action admission consideration, and extended application deadlines (SAA only). Other support services include referrals to obtain campus housing and financial

aid counseling. Academic support for EOP and SAA students is offered through the Office of Academic Support and Instructional Services (OASIS). OASIS sponsors summer bridge (a summer residential program) and peer counseling. OASIS also gives priority for individual tutoring to EOP and SAA students and offers a variety of academic skills workshops and cross-cultural programming.

Prospective EOP and SAA students should obtain a UC undergraduate application packet from any high school or community college counselor or directly from UCSD. All EOP applicants must be California residents, with the exception of American Indians. SAA applicants do not have to be residents of California. To be considered for SAA, complete the ethnic identity information entry on the application. If your ethnic identity is black, Mexican American, or American Indian you will be included in the Student Affirmative Action program. To apply for EOP, fill in the ethnic identity information and the information requested in the application pertaining to family size and income, parental education level and occupation. This information is used in conjunction with other information from the admission application in determining eligibility for EOP.

#### Application Checklist:

1. File a UC Undergraduate Admission Application with the University of California Application Processing Center, P.O. Box 23460, Oakland, CA 94623-0460 (include appropriate fee amount; fee waivers are available in hardship cases).
2. Include the required autobiographical essay of personal information covering your family background (i.e., education, size, employment, etc.) and any special circumstances. The essay should give your reasons for applying to EOP or SAA and should also elaborate on your career goals and personal interests.
3. If you are a freshman applicant, you must also submit aptitude test scores from either the American College Test (ACT), or the Scholastic Aptitude Test (SAT). Additionally, scores must be reported from three College Board Achievement Tests (ACH), including one each in English composition, mathematics, and one test in either English literature, foreign language, a science, or social studies.

4. If you are a transfer applicant, request official transcripts from all colleges you have attended. Have them sent directly to the UCSD Office of Admissions.

Financial aid is available to eligible EOP and SAA students from the regular state, federal, and university sources administered through the UCSD Financial Services Office. Although EOP eligibility does not guarantee financial aid, the low income ceilings for EOP eligibility mean that most EOP applicants should qualify for substantial financial awards. Financial aid information is available from the UCSD Student Financial Services Office. Pre-application assistance should be sought from your high school or community college counselor as well as from the Office of Student Outreach and Recruitment. For additional information about EOP or SAA eligibility requirements, program services, or general information regarding UCSD, call or write:

University of California, San Diego  
Student Outreach and Recruitment, 0337  
University of California, San Diego  
9500 Gilman Drive  
La Jolla, California 92093-0337  
(619) 534-4831.

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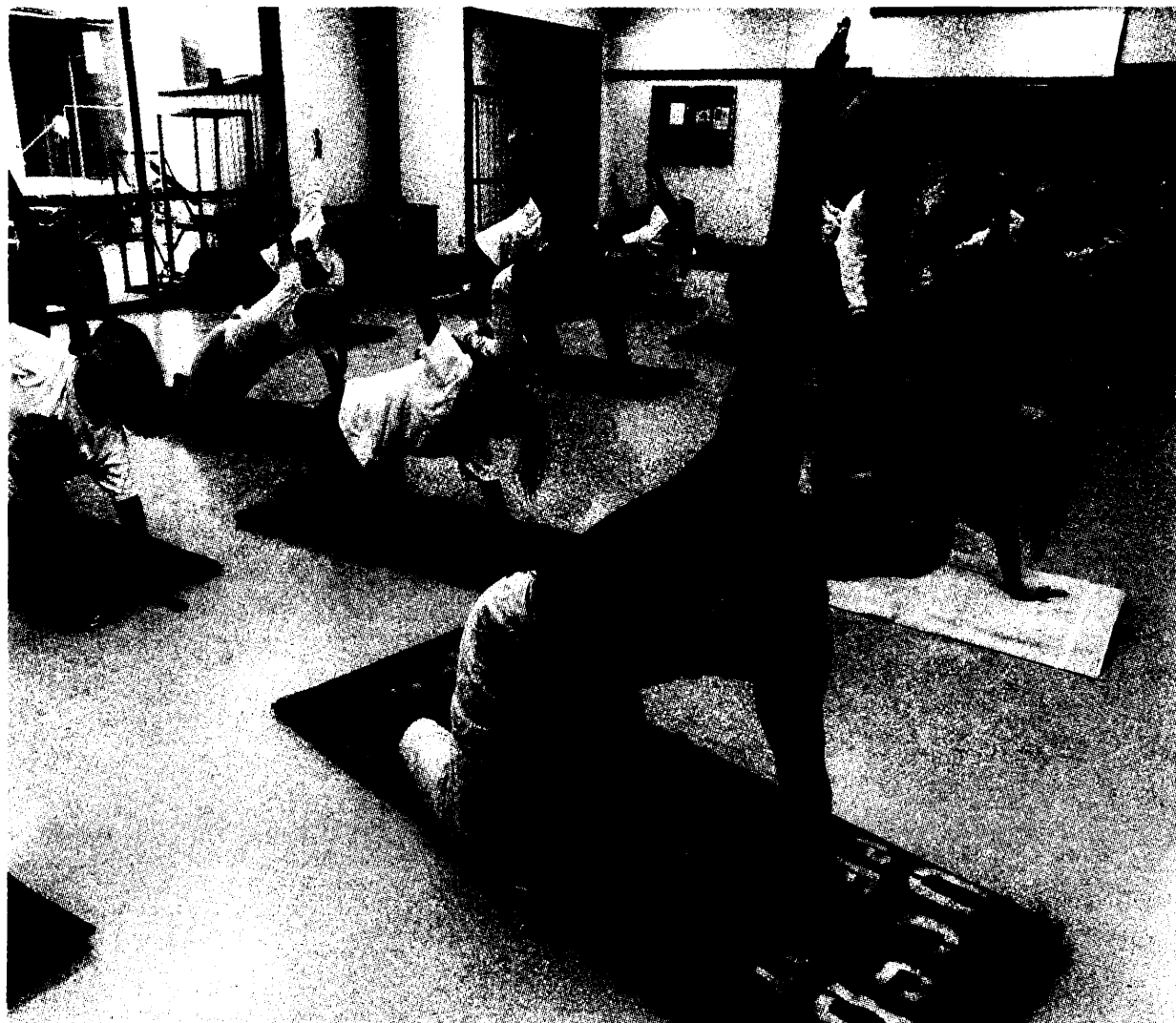


## UNDERGRADUATE COLLEGES AND MAJORS

Even though you may be uncertain about your major, your application for admission must include the name of the UCSD college with which you plan to affiliate (Revelle, Muir, Third, Warren, or Fifth). You *must* indicate a second or third choice in the event your first choice college closes early. Applicants may be reassigned to another college by the Admissions Office if enrollment quotas prohibit first choice. Applicants who do not indicate a UCSD college preference will be assigned a college.

In the "Choosing a College" section, which describes the educational philosophies of the five colleges at UCSD, you will find information concerning the requirements of each college. It is very important that you read that section of the catalog carefully, and that you decide which of the colleges is the right one for you.

Although you may be accepted to the college of your choice, if openings are available, you may have to pass specific courses with grades of a given level to become a degree candidate in your preferred major. This set of



conditions, determined on a department-by-department basis, and approved by the San Diego Committee on Educational Policy, is explained in detail under the department listing in this catalog.

As of the printing of this catalog the Departments of Applied Mechanics and Engineering Sciences, Computer Science and Engineering, and Electrical and Computer Engineering are screening admissions to the major, and students are admitted to pre-major status only. The mathematics-computer science major also admits to pre-major status only. As a pre-major you must satisfy all prerequisites before admission to the major. Other departments, however, may be approved to offer pre-majors by the Committee on Educational Policy subsequent to this publication.

Please refer to "Major Fields of Study" in the introduction to the catalog.

## UNDERGRADUATE ADMISSIONS

### MINIMUM REQUIREMENTS

The university's *minimum* undergraduate admission requirements, which are the same

on all University of California campuses, are based on three principles. Simply stated, they are: (1) the best predictor of success in the university is high scholarship in previous work; (2) the study of certain subjects in high school gives a student good preparation for university work and reasonable freedom in choosing an area for specialized study; and (3) standardized aptitude tests provide a broad base for comparison, and mitigate the effects of differing grading practices.

You should understand that the academic requirements for admission are *minimum* entrance standards. Completing the required high school courses with satisfactory grades will not automatically determine whether you will be selected for admission to UCSD, as students are chosen from a large number of highly competitive applicants. Most of these applicants will have met more than the minimum requirements; thus selection depends on additional factors.

For example, you should take as many honors and advanced placement courses as possible and should try to exceed the minimum academic subject requirements in all subjects, particularly the a-f requirements and/



or courses in mathematics, laboratory sciences, and foreign languages. High test scores are necessary in conjunction with strong performance in classes and a consistent pattern of courses. Overall performance must be well above minimum requirements in order to admit you to the campus and major of your choice.

## **UCSD ADMISSION POLICY AND SELECTION CRITERIA**

The undergraduate admissions policy at the University of California, San Diego is designed to select a highly qualified and diverse student body. As a major public institution of higher education serving the teaching, research, and public service needs of California, UCSD strives to reflect the diversity of the population of the state. This undergraduate admission policy has been developed by the San Diego campus in compliance with the University of California Policy on Undergraduate Admissions that "seeks to enroll a student body that, beyond meeting the University's eligibility requirements, demonstrates high academic achievement or exceptional personal talent, and that encompasses the broad diversity of cultural, racial, geographic, and socioeconomic backgrounds characteristic of California."

### **FRESHMEN SELECTION**

In recent years, the number of applicants has far exceeded the number of spaces available and it has become necessary to adopt standards which are much more demanding than the minimum requirements to admit students. The San Diego campus has developed the following procedures for the selection of applicants to be admitted from its pool of eligible candidates.

1. All freshmen will be ranked using an academic index based on the high school grade-point average calculated on all academic courses completed in the subject areas specified in the university's eligibility requirements (the a-f subjects); scores on the required tests—the Scholastic Aptitude Test or the American College Test, and the College Board Achievement Tests; the number and content of courses successfully completed in academic subjects beyond the minimum specified in the university's eligibility requirements; and the number of university approved

accelerated, advanced placement, and honors courses completed or in progress. The academic index will be used to select 60 percent of the admits.

2. The remaining 40 percent of the freshman admits, with the exception of those admitted through special action, are selected using the academic index as the basis for selection. The applicants not in the 60 percent above will be re-ranked and bonus points will be added to the index based on consideration of other factors, including low family income, physical disabilities, community and institutional service, special talents, interests, leadership, honors and awards received, and special or personal circumstances or difficulties.

### **ADVANCED-STANDING SELECTION**

The admission of transfer applicants will be limited to those who have satisfactorily completed fifty-six transferable semester-units (eighty-four quarter-units) and will be on a priority basis. In priority order, the following will be admitted: Transfer Admissions Guarantee (TAG) applicants satisfying the admission criteria; Eligible SAA applicants; California community college applicants with fifty-six transferable units and a GPA of 2.8 or better; Intercampus Transfers (ICTs) with UC GPAs of 2.5 or better and fifty-six transferable units (eighty-four quarter); California residents attending public or private four-year institutions (in or out of state) with fifty-six transferable units and 3.0 or better GPA; and non-California residents with fifty-six transferable units and 3.0 or better GPA.

### **ADMISSION AS A FRESHMAN APPLICANT**

#### **MINIMUM REQUIREMENTS**

To be eligible for admission to the university as a freshman you must meet the high school diploma requirement, the subject requirement, the scholarship requirement, and the examination requirement, which are described below.

#### **HIGH SCHOOL DIPLOMA REQUIREMENT**

You must earn a diploma from a high school in order to enter the university as a freshman. The Certificate of Proficiency, awarded by the California State Department of Education upon successful completion of the

High School Proficiency Examination, proficiency tests from other states, and the General Education Development (GED) certificate, will be accepted in lieu of the regular high school diploma. Subject, scholarship, and examination requirements discussed below must also be met.

### **SUBJECT REQUIREMENT**

A student applying for admission as a freshman to the University of California must have completed a minimum of sixteen units of high school work during grades nine through twelve. (A one-year course is equal to one unit; a one-semester course is equal to one-half unit.)

Fifteen of these required units must have been earned in academic or college preparatory courses, as specified and defined below. Also, at least seven of the fifteen units must have been earned in courses taken during the last two years of high school.

### **Specific "a-f" Course Requirements**

#### **a. History: 1 unit**

One year of United States history, or one-half year of United States history and one-half year of civics or American government, taken in the ninth grade or later.

#### **b. English: 4 units**

Four years of college preparatory English—composition and literature. (All English courses must require frequent and regular practice in writing expository prose compositions of some length. Also, not more than two semesters of ninth-grade English will be accepted for this requirement.)

#### **c. Mathematics: 3 units**

Three years of mathematics—elementary algebra, geometry, and intermediate algebra. (Mathematics courses taken in grades seven and eight may be used to meet part of this requirement if they are accepted by the high school as equivalent to its own courses.)

#### **d. Laboratory Science: 1 unit**

A year course in one laboratory science, taken in the tenth grade or later.

#### **e. Foreign Language: 2 units**

Two years of one foreign language in courses that provide instruction in grammar, vocabulary, reading, and composition, and that emphasize the development of aural and oral skills.

**UNDERGRADUATE ADMISSIONS, POLICIES AND PROCEDURES**

**f. College Preparatory Electives: 4 units**

Four units in addition to those required in a through e. above, to be chosen from at least two of the following subject areas: history, English, advanced mathematics, laboratory science,\* foreign language, social science, and fine arts. (In general, elective courses should involve considerable reading and should aim to develop a student's analytical and reasoning ability and skill with written and oral exposition.)

**Courses Satisfying the "f" Requirement**

*History and English* Elective courses that fit the general description in "f" above are acceptable.

\* A general science course taken in the ninth grade as preparation for a laboratory science course is an acceptable elective. However, the course cannot be used to satisfy the "d" requirement.

*Advanced Mathematics* Trigonometry, linear algebra, precalculus (mathematical analysis), calculus, statistics, computer science, and similar courses are acceptable. Courses containing significant amounts of material from arithmetic or from shop, consumer, or business mathematics are not acceptable.

*Laboratory Science* Courses in the biological and physical sciences are acceptable.

*Foreign Language* Elective courses may be in either the same language used to satisfy the "e" requirement or in a second foreign language. If a second language is chosen, however, at least two years of work in that language must be completed.

*Social Science* Elective courses that fit the general description in "f" above are acceptable. In addition, these courses should serve as preparation for lower-division work in social science at the university. Courses of an

applied, service, or vocational nature are not acceptable.

*Fine Arts* Elective courses in fine arts should enable students to understand and appreciate artistic expression, and to talk and write with discrimination about the artistic material studied. Courses devoted to developing creative artistic ability and courses devoted to artistic performance are acceptable. Courses that are primarily recreational or are offered under physical education are not acceptable.

**HONORS LEVEL COURSES**

The University of California encourages students to take demanding advanced academic courses in all fields. Accordingly, for students graduating from high school in 1984 or thereafter, the grades in up to four units taken in the student's last two years of high school will be counted on a scale A = 5, B = 4, C = 3, if these courses are certified by the high school

**ELIGIBILITY INDEX**

A-F GPA	ACT <sup>1</sup> COMPOSITE	OR	SAT <sup>2</sup> TOTAL	A-F <sup>2</sup> GPA	ACT <sup>1</sup> COMPOSITE	OR	SAT <sup>2</sup> TOTAL
2.82	36		1590	3.06	25		1030
2.83	36		1570	3.07	24		1010
2.84	35		1540	3.08	23		980
2.85	35		1520	3.09	23		960
2.86	35		1500	3.10	22		940
2.87	34		1470	3.11	22		910
2.88	34		1450	3.12	21		890
2.89	33		1430	3.13	21		870
2.90	33		1400	3.14	20		840
2.91	33		1380	3.15	20		820
2.92	32		1360	3.16	19		800
2.93	31		1330	3.17	19		770
2.94	31		1310	3.18	18		750
2.95	31		1290	3.19	18		730
2.96	30		1260	3.20	17		700
2.97	30		1240	3.21	17		680
2.98	29		1220	3.22	16		660
2.99	28		1190	3.23	16		630
3.00	28		1170	3.24	15		610
3.01	27		1150	3.25	15		590
3.02	27		1120	3.26	14		560
3.03	26		1100	3.27	14		540
3.04	26		1080	3.28	13		520
3.05	25		1050	3.29	12		490

<sup>1</sup>ACT is scored in intervals of 1 point, from a minimum of 1 to a maximum of 36.

<sup>2</sup>SAT is scored in intervals of 10 points, from a minimum of 400 to a maximum of 1600.



and the University of California as offered at an honors level. These courses must be in the areas of history, English, advanced mathematics, laboratory science, and foreign language.

**EXAMINATION REQUIREMENT**

All freshman applicants *must* take and submit scores from tests specified below. If you are applying for admission to the fall term, you should take the tests no later than December of your senior year.

1. One aptitude test, either a *or* b:
  - a. Scholastic Aptitude Test (SAT)  
Your verbal and mathematics scores on this test must be from the same sitting.
  - b. American College Test (ACT)  
The composite score will be reported.

2. Three College Board Achievement Tests (ACH)

These must include (a) English Composition,\* (b) Mathematics, Level 1 or 2; and (c) *one* from English literature, foreign languages, sciences, *or* social studies.

If tests are repeated, the university will accept the highest score received. The best SAT test is a total score of the math and verbal taken at the same sitting. See your counselor for information and registration forms or write to the College Entrance Examination Board (SAT), P.O. Box 1025, Berkeley, California 94701. For ACT information, write to the ACT Program, P.O. Box 168, Iowa City, Iowa 52243. You should arrange to take these tests no later than December of your senior year.

**SUBJECT A EXAMINATION**

If the Subject A requirement is not satisfied prior to April 1, admitted students are required to take the university-wide Subject A Examination in mid-May. Notice of this examination will be sent to all admitted students. There will be a \$40 fee attached.

**FRESHMAN ELIGIBILITY**

**CALIFORNIA RESIDENTS MINIMUM REQUIREMENTS**

(Refer also to "Admission as a Freshman Applicant.")

Please be advised that these are minimum eligibility requirements. The San Diego campus has been unable to accommodate all

eligible applicants. See "UCSD Admission Policy and Selection Criteria."

**Eligibility Index:** An "Eligibility Index" is used to determine minimum eligibility for California applicants. If you make a perfect score on the SAT (1600) or the ACT (36) you need a GPA of only 2.82 to be eligible for admission. On the other hand, if you have a GPA of 3.30 or better, you are eligible even with the lowest test scores. Between these extremes, the following table is used. If you know your GPA (using the best grades earned in grades ten, eleven, and twelve to meet minimum requirements in the "a through f" pattern) the table will show the required test score; conversely, if you know your SAT total or your ACT composite, the table will show the required GPA.

**Eligibility by Examination Alone:** If you do not meet the scholarship and subject requirements for admission, you can qualify for eligibility as a freshman by examination alone. To do so, you must earn 1300 on the SAT or 31 on the ACT. Your total score on the three Achievement Tests must be 1650 or higher with no area score less than 500.

Applicants who have completed fewer than twelve transferable college units since graduation may qualify for admission by examination alone. (Note: if you have completed transferable college courses, CEEB Achievement tests cannot be taken in academic subjects covered in those courses.) Note: This option can be considered only when the number of applications received can be accommodated.

**NON-CALIFORNIA RESIDENTS MINIMUM REQUIREMENTS**

(Refer also to "Admission as a Freshman Applicant" and "Freshman Eligibility: California Residents.")

Please be advised that these are minimum eligibility requirements. The San Diego campus has been unable to accommodate all eligible applicants. See "UCSD Admission Policy and Selection Criteria."

**Scholarship:** An applicant who is not a resident of California is eligible to be considered for admission to the university with a grade-point average of 3.40 or better, calculated on the required high school subjects. These subjects, referred to as "a through f," are the same for the nonresident as for the resident. (The "Eligibility Index" applies to the California applicant only.)

**Eligibility by Examination Alone:**

If you do not meet the scholarship and subject requirements for admission, you can be considered for admission as a freshman by examination alone. To do so you must earn 1300 on the SAT or 31 on the ACT. Your total score on the three Achievement Tests must be 1730 or higher with no area score less than 500.

Applicants who have completed fewer than twelve transferable college units since graduation may qualify for admission by examination alone. (Note: if you have completed transferable college courses, CEEB Achievement tests cannot be taken in academic subjects covered by those courses.)

**ADDITIONAL PREPARATION FOR UNIVERSITY WORK: FRESHMAN APPLICANTS**

High school courses required for admission to the university are listed at the beginning of this section. This list is in no way intended to constitute an outline for a valid high school program. The courses listed were chosen largely for their value as predictors of success in the university. These required courses add up to fifteen "Carnegie" units, while graduation from high school requires from fifteen to nineteen. Courses beyond our requirements should be chosen to broaden your experience in such fields as social sciences and the fine arts, and should fit in with your personal plans for the future.

A science major, for example, besides taking courses in chemistry, physics and biology, will find more than three years of mathematics essential. A science major without a working knowledge of trigonometry and at least intermediate algebra is likely to be delayed in getting a degree. If you have an interest in languages or plan a college program with a foreign language requirement, you should have completed more than the two years of foreign language needed for admission.

You should understand that the "a through f" requirements for admission are *minimum* entrance standards. Completing the required high school courses with satisfactory grades will not automatically prepare you for freshman work in every subject, much less in your major or program of study. Many entering students discover to their dismay that they are not adequately prepared for basic courses, such as English composition and calculus, which they are expected to take in their fresh-

\*The Achievement Test in literature may not be substituted.

man year. Also, many undergraduate majors, particularly those in sciences and mathematics, require more high school preparation than that necessary for admission. This lack of preparation can cause problems for students who do not choose a major until after they enter the university, or for those who prepare for one major but later decide to change to another.

For these reasons, you should take courses that will prepare you beyond minimum levels of competence in reading, writing, and mathematics. A student who is well prepared for university work will have taken four years of English in high school, four years of mathematics, two to three years of foreign language, two to three years of laboratory science, one year of history, and one or more years of art or humanities.

*Reading:* Many students are not prepared for either the kinds or amounts of reading demanded of freshmen at the university. You should become proficient in reading and understanding technical materials and scholarly works. You should learn to read analytically and critically, actively questioning yourself about the author's intentions, viewpoint, arguments, and conclusions. You should also become familiar and comfortable with the conventions of standard written English and with various writing strategies and techniques. Your reading experience should include original works in their entirety, not just textbooks and anthologies, and should encompass a wide variety of forms and topics.

*Writing:* Effective critical thinking and proficiency with the written language are closely related, and both are skills which every university student must master. By university standards, a student who is proficient in English composition is able to (a) understand the assigned topic; (b) select and develop a theme by argument and example; (c) choose words which aptly and precisely convey the intended meaning; (d) construct effective sentences, i.e., sentences that economically and successfully convey the writer's ideas and display a variety of structures; (e) demonstrate an awareness of the conventions of standard written English, avoiding such errors as sentence fragments, run-together sentences, faulty agreements, and improper pronoun references; and (f) punctuate, capitalize, and spell correctly.

If you plan to attend the university, you must take English courses in high school that

require the development and practice of these skills. You must take at least four years of English composition and literature that stress expository writing; the development of persuasive critical thinking on the written page.

*Mathematics:* Many undergraduate majors require preparation in mathematics beyond that necessary for admission to the university. All majors in the natural and life sciences, engineering, and mathematics require calculus. Many majors in the social sciences require statistics or calculus, sometimes both. If you have selected a major that requires either calculus or statistics you should expect to take that course during your freshman year at the university.

Calculus is also required for undergraduates preparing for careers in environmental sciences, dentistry, medicine, optometry, pharmacy, and biostatistics. Many students are not aware of the large number of fields outside the natural and mathematical sciences which require calculus or statistics as prerequisites.

You should prepare yourself for university courses in calculus while you are still in high school. In addition to the three years of mathematics required for admission, you should take a year of precalculus mathematics. These courses should include: (a) basic operations with numerical and algebraic functions; (b) operations with exponents and radicals; (c) linear equations and inequalities; (d) polynomials and polynomial equations; (e) functions and their graphs; (f) trigonometry, logarithms, and exponential functions; and (g) applications and word problems. Students who plan to enter a field which requires statistics should take at least the second year of algebra.

If you are not proficient in basic and intermediate algebra, you will be at an enormous disadvantage in the university. You will have to take one or more precalculus courses before beginning calculus and may also have to take preparatory courses before beginning statistics. The necessity to take these preparatory courses could seriously delay your undergraduate studies.

For more detailed information on recommended high school courses, ask your counselor to show you a copy of the university-wide publication *Prerequisites and Recommended Subjects*.

## **COLLEGE CREDIT: FRESHMAN APPLICANTS**

There are many steps you can take to earn credit which will be applicable to your graduation from college. Some of these steps may be taken even before you graduate from high school. Among them are the following:

### **COLLEGE COURSES**

Many high schools have arrangements with nearby postsecondary institutions, allowing you to take regular courses while you are still in high school. These courses are accepted by the university exactly as they would be if you were a full-time college student if courses are posted for credit on the college transcript.

No matter how many college units you earn before graduating from high school, you still apply as a freshman.

### **COLLEGE BOARD ADVANCED PLACEMENT**

The university grants credit for *all* College Board Advanced Placement Tests on which a student scores 3 or higher. The credit may be subject credit, graduation credit, or credit toward general education or breadth requirements, as determined by the college. Students who enter the university with AP credit do not have to declare a major earlier than other students, nor are they required to graduate earlier.

Counselors should be aware that the College Board reports all AP test results to the university. Students may not choose which test scores they wish reported. Students should be encouraged to take AP tests, when appropriate. Counselors should not overlook the opportunity for a student who is fluent in a language other than English to gain AP credit. AP test scores will not adversely affect a student's chances for admission.

The university grants credit for advanced placement tests as described below. Credit is expressed in quarter-units.

The Computer Science test was revised recently and there are now two tests: Computer Science A and Computer Science AB. The revised tests are under review by the university. Until the review is completed, four quarter-units of credit will continue to be awarded for the test. The university is also reviewing the new AP test in Economics.

Art (Studio)	
Drawing Portfolio	8
General Portfolio	8
(8 unit maximum for both tests)	
Art History	8
Biology	8
Chemistry	8
Classics	
Latin: Virgil	4
Latin: Catullus/Horace	4
Computer Science	
Computer Science A	2
Computer Science AB	4
(4 unit maximum for both tests)	
Economics	
Microeconomics	4
Macroeconomics	4
English	
Composition and Literature	8
Language and Composition	8
(8 unit maximum for both tests)	
Foreign Language	
French Language	8
French Literature	8
German Language	8
German Literature	8
Spanish Language	8
Spanish Literature	8
Government and Politics	
American	4
Comparative	4
History	
American	8
European	8
Mathematics	
Calculus AB	4
Calculus BC	8
(8 unit maximum for both tests)	
Music	
Listening and Literature	8
Theory	8
(8 unit maximum for both tests)	
Physics	
Physics B	8
Physics C1 (Mechanics)	4
Physics C2 (Electricity and Magnetism)	4
(8 unit maximum for three tests)	

Requirements met by advanced placement test are described below by college. Even if subject credit or credit toward specific requirements is not mentioned in the college lists, students receive university credit as described

above for all AP tests on which they score 3 or higher. If a student is exempt from a particular course at UCSD, duplication of this course does not earn credit. Space does not permit a full discussion of how AP credit is granted for each major, so students should be advised to check with the major department. The campus Office of Admissions can advise counselors and students about these issues.

### ADVANCED PLACEMENT EXAMINATIONS

The Advanced Placement Examinations of the College Entrance Examination Board are taken, usually during the senior year, in conjunction with courses taken in high school. You will receive eight quarter-units of university credit for most examinations in which you earn a score 5, 4, or 3. These credits will apply toward the total required for graduation from the university. See the Advanced Placement chart which appears later in this section.

### ADMISSION AS A TRANSFER APPLICANT

The university defines a transfer applicant as a high school graduate who has been a registered student in another college or university or in college-level extension classes other than a summer session immediately following high school graduation. A transfer applicant may not disregard his or her college record and apply for admission as a new freshman.

### TRANSFER REQUIREMENTS EFFECTIVE FALL 1989

Transfer students applying for admission for fall 1989 and thereafter will have to satisfy the freshman admission requirement in mathematics that became effective fall 1986: that is *three* years of mathematics.

### SCHOLARSHIP REQUIREMENT

The requirements for admission as a transfer student vary according to your high school record.

### DETERMINING YOUR GRADE-POINT AVERAGE

Your grade-point average for admission purposes is determined by dividing the total number of acceptable units you have attempted

into the number of grade points you earned on those units. You may repeat courses that you completed with a grade lower than C. Only the grade earned in the repeated course will be included in the grade-point average.

The scholarship standard is expressed by a system of grade points and grade-point averages earned in courses accepted by the university for advanced-standing credit. Grade points are assigned as follows: for each unit of A, 4 points; B, 3 points; C, 2 points; D, 1 point; and F, no points.

### CREDIT FROM ANOTHER COLLEGE

The university gives unit credit to transfer students for courses they have taken at other accredited colleges and universities, including some extension courses. To be accepted for credit, the courses must be consistent with those offered at the university, as determined by the Office of Admissions. Applications from students who appear to have more than 135 quarter-units (90 semester-units) of transfer credit will be reviewed for approval by the UCSD college to which they applied.

Many students who plan to earn a degree at the university find it to their advantage to complete their freshman and sophomore years at a California community college. Each community college offers a full program of courses approved for transfer credit. A student may earn 105 quarter-units (70-semester units) toward a university degree at a community college. Subject credit for courses taken in excess of those units will be granted. *UCSD will give admission preference to community college transfers in this category.*

The transferability of units from California community colleges and all other postsecondary institutions proceeds as follows: (1) transferability of units is decided by the system-wide administration of the University of California, and these decisions are binding upon all UC campuses; (2) applicability of transferred units to breadth (general-education) requirements is decided for each UCSD college by its provost (see also "Transfer Agreements" below); (3) applicability of units toward the major is decided by the appropriate UCSD department. Before applying to UCSD you may obtain more information on many of these matters from the Student Outreach and Recruitment Office.

# ADVANCED PLACEMENT CREDIT: APPLICATION TO COLLEGE AND MAJOR REQUIREMENTS

EXAM AND UNITS	UCSD COURSE EXEMPTIONS (OR USE ON MAJOR)	REVELLE COLLEGE
Art (Studio) • Drawing Portfolio ..... 8 • General Portfolio ..... 8 (8-unit maximum for both tests)	None.	Fulfills fine arts requirement or 2 courses of the noncontiguous minor or may be used as 8 units of elective credit.
Art—History ..... 8	None.	Fulfills fine arts requirement or 2 courses of the noncontiguous minor or may be used as 8 units of elective credit.
Biology ..... 8	Score of 4 or 5 = 8 units credit and exempt from any 2 courses of Biology 1,2,3 sequence. Student allowed to take 1 course from this sequence for credit. Score of 3 = Biol. 10.	Score of 3, 4, or 5 meets Revelle biology requirement even though Biol. 10 does not.
Chemistry ..... 8	Score of 3 = 8 units credit and exempt Chem. 4 or 11. Score of 4 = 8 units credit and exempt Chem. 11, 12 or Chem. 6A and may take Chem. 7A for credit. Score of 5 = 8 units credit and exempt Chem. 6A, 6B, 6C or Chem. 7A, 7B.	Partial completion of natural science requirement.
Classics • Latin: Virgil ..... 4 • Latin: Catullus/Horace ..... 4	Score of 3, 4, or 5 = 4–8 units of elective credit or 1–2 quarters of college Latin. (See Lit/La 2 professor.)	Usually prepares student to pass proficiency exam: 2 courses of the noncontiguous minor or may be used as 8 units of elective credit.
Computer Science • Computer Science A ..... 2 • Computer Science AB ..... 4 (4-unit maximum for both tests)	Score of 5 only on AB exam equivalent to CSE 65. Score of 3 or 4 on A or AB exam = elective units.	1 course on noncontiguous minor.
Economics • Microeconomics ..... 4 • Macroeconomics ..... 4	Score of 5 AP micro (AP macro) = exempt Econ. 1A/2A (1B/2B). Score of 3 or 4 = elective units. Majors/minors exempt 1A/2A or 1B/2B only with score of 5.	Each score of 3, 4, or 5 exempts student 1 course on social science requirement.
English • Composition and Literature ..... 8 • Language and Composition ..... 8 (8-unit maximum for both tests)	Score of 3, 4, or 5 meets Subject A requirement.	2 courses of the noncontiguous minor or 8 units of elective credit.
Foreign Language • French Language ..... 8 • French Literature ..... 8 • German Language ..... 8 • German Literature ..... 8 • Spanish Language ..... 8 • Spanish Literature ..... 8	Score of 3, 4, or 5 = exempt language 1B/1BX and 1C/1CX.	Prepares student to pass proficiency exam.
Government and Politics • American ..... 4	Score of 3, 4, or 5 satisfies American history and institutions requirement. Score of 3, 4, or 5 = exempt Poli. Sci. 10.	1 course toward social science requirement or 1 course of noncontiguous minor.
Government and Politics • Comparative ..... 4	Score of 3, 4, or 5 = exempt Poli. Sci. 11.	1 course toward social science requirement or 1 course of noncontiguous minor.
History • American ..... 8	Score of 3, 4, or 5 = exempt History: HILD 2A-2B. Satisfies American history and institutions requirement.	2 courses toward social science requirement or 2 courses of noncontiguous minor.
History • European ..... 8	Score of 3, 4, or 5 = exempt History HILD 3A-3B	2 courses of the noncontiguous minor.
Mathematics • Calculus AB ..... 4 • Calculus BC ..... 8 (8-unit maximum for both tests)	Score of 3, 4, or 5 AB exam, 4 units = exempt Math. 2A. BC exam, 8 units = exempt Math. 2A, 2B.	AB exam = 1 course toward math requirement; BC exam = 2 courses toward math requirement.
Music • Listening and Literature ..... 8 • Theory ..... 8 (8-unit maximum for both tests)	None	Fulfills fine arts requirement and 1 course of noncontiguous minor.
Physics • Physics B ..... 8 • Physics C Mechanics ..... 4 • Physics C Electricity and Magnetism ..... 4 (8-unit maximum for all three tests)	B exam = 8 units of elective credit and exempt Physics 10. C exam (Mech.) score of 3 or 4 = 4 units credit and exempt Physics 1A and may take Physics 2A or 4A for credit; score of 5 = 4 units credit and exempt Physics 2A and may take Physics 4A for credit. C exam (E&M) score of 3 or 4 = 4 units credit and exempt Physics 1B and may take Physics 2B or 4B for credit; score of 5 = 4 units credit and exempt Physics 2B and may take Physics 4B for credit.	Each 4 units on C exam (Mech. or E&M) can meet 1 course of the natural science requirement.

The University of California grants credit for all College Board Advanced Placement Tests on which a student scores 3 or higher. The credit may be subject credit for use on a minor or prerequisites to a major, or credit toward general-education requirements or elective units toward graduation.

The number of units granted for AP tests are not counted toward the maximum number of credits required for formal declaration of an undergraduate major or the maximum number of units a student may accumulate prior to graduation. Students who enter the university with AP credit do not have to declare a major earlier than other student, nor are they required to graduate earlier.

MUIR COLLEGE	THIRD COLLEGE	WARREN COLLEGE	FIFTH COLLEGE
8 units of elective credit.	8 units of elective credit.	8 units of elective credit.	8 units of elective credit.
8 units of elective credit.	8 units of elective credit.	8 units of elective credit.	8 units of elective credit.
Score of 3 meets one course of natural science option; score of 4 or 5 meets two courses of natural science option.	Score of 3, 4, or 5 meets 1 course of natural science requirement. May also apply 1 course toward disciplinary breadth if noncontiguous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	Score of 3, 4, or 5 meets one course of natural science requirement.
Score of 4 or 5 meets two courses of natural science option.	Meets 1 course of natural science requirement and may apply 1 course toward disciplinary breadth if noncontiguous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	Meets 1-2 courses of natural science requirement.
Meets 1 to 2 courses of foreign language option.	May apply 1 to 2 courses toward disciplinary breadth if noncontiguous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	4-8 units elective credit.
2-4 units elective credit.	AB exam = 1 course toward computing component of mathematics and logic requirement or 1 course toward disciplinary breadth if noncontiguous to major.	May apply toward formal skills or program of concentration. See Warren adviser for details.	Score of 5 = 1 course toward math/computer science requirement.
Each score of 5 exempts 1 course on social science requirement.	Each score of 3, 4, or 5 may apply as 1 course toward disciplinary breadth if noncontiguous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	Elective credit.
8 units of elective credit	8 units of elective credit	8 units of elective credit	8 units of elective credit
Determines placement in language sequence if student chooses that option; exempt 2 courses of the language option 1B/1BX, 1C/1CX.	May apply 2 courses toward disciplinary breadth if noncontiguous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	8-16 units of elective credit.
1 course toward social science requirement.	May apply as 1 course toward disciplinary breadth if noncontiguous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	4 units of elective credit.
1 course toward social science requirement.	May apply as 1 course toward disciplinary breadth if noncontiguous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	4 units of elective credit.
Meets 2 courses of humanities option.	May apply 2 courses toward disciplinary breadth if noncontiguous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	Elective credit.
Meets 2 courses of humanities option.	May apply 2 courses toward disciplinary breadth if noncontiguous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	1 course may apply toward regional specialization. See Fifth adviser for details.
AB exam meets 1 course of math option; BC exam completes 2 courses of math option.	If AB exam may apply 1 course toward math. and logic requirement. If BC exam may apply 2 courses toward math. and logic requirement.	AB exam meets 1 course of formal skill requirement; BC exam completes 2 courses formal skills requirement.	AB exam = 1 course toward math./computer science requirement. BC exam completes math/computer science requirement.
2 courses of fine arts option	1 course toward fine arts requirement and 1 course toward the disciplinary breadth requirement if noncontiguous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	1 course toward fine arts requirement.
Each 4 units of C exam (Mech. or E&M) can meet 1 course of the natural science option.	B exam = 1 course of natural science requirement and 1 course toward disciplinary breadth if noncontiguous to major. 4 units of C exam = 1 course of natural science requirement. 8 units of C exam = 1 course of natural science requirement and 1 course toward disciplinary breadth if noncontiguous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	B exam = 1 course for natural science; C exam (E&M) = 1 course for natural science; C exam (Mech.) = 1 course for natural science for a total of 2 courses maximum.

A student cannot give credit for a UCSD course which duplicates AP credit. Where the chart says "exempt" or "equal to a UCSD course number," that course may not be taken for credit. Students who are fluent in a language other than English should not overlook the opportunity to get AP credit by taking the foreign/literature exams.

NOTE: Please see college academic adviser for clarification of any questions you may have.



Applicants who have completed courses at a postsecondary institution outside the U.S.A. should contact an admission evaluator in the Office of Admissions. Advanced standing credit for appropriate courses will be decided on an individual basis.

NOTE: The University of California does not give credit for CLEP examinations.

### NEW UNIVERSITY OF CALIFORNIA TRANSFER AGREEMENTS

The University of California established two new transfer policies in 1988. These two new policies, UC Transfer Reciprocity and Intersegmental General Education Transfer Curriculum Agreement (described below) allow transfer students to fulfill lower-division breadth and general-education (B/GE) requirements prior to transfer.

Transfer students may elect to fulfill their lower-division B/GE requirements by either of these two new policies or may elect to fulfill the B/GE requirements at UCSD. Students electing to satisfy the requirements by either of the new agreements are admitted to Warren, Third, or Muir College only.

### UC TRANSFER RECIPROCIDY

Transfers who have attended any campus of the University of California and satisfied lower-division breadth and general-education (B/GE) requirements at that campus prior to transfer may consider this requirement satisfied on the San Diego campus.

Transfers applying in this category should obtain a "certificate of completion of GE requirements" from the campus at which these requirements were satisfied. This can be in the form of a letter or memo addressed to your UCSD college advising office.

#### English Communication

One course, English composition, three semester/four to five quarter-units; this course is a prerequisite to critical thinking.

One course, critical thinking—English composition, three semester/four to five quarter-units; strong emphasis on writing; prerequisite: English composition.

#### Mathematics

One course, mathematics/quantitative reasoning, three semester/four to five quarter-units.

### Arts and Humanities

Three courses, at least one course in arts and at least one course in humanities, nine semester/twelve to fifteen quarter-units.

### Social and Behavioral Sciences

Three courses in at least two disciplines within this subject area, nine semester/twelve to fifteen quarter-units.

### Physical and Biological Sciences

Two courses, one course in each area, and at least one must include a laboratory, seven to nine/nine to twelve quarter-units.

### Language other than English

Proficiency equivalent to two years' high school study.

### INTERSEGMENTAL GENERAL EDUCATION TRANSFER CURRICULUM AGREEMENTS

Transfers from California community colleges can fulfill the UC lower-division breadth and general-education requirements by completing the Intersegmental General Education Transfer Curriculum (IGETC). The transfer core curriculum consists of the following subjects:

### TRANSFER ELIGIBILITY

#### CALIFORNIA RESIDENT (MINIMUM REQUIREMENTS)

As a transfer applicant you must meet one of the requirements described below to be considered for admission to the university.

1. If you completed all the "a-f" courses in high school and achieved the required score on the Eligibility Index, you are minimally eligible for admission to the university any time after you have established a grade-point average of 2.0 or better in transferable college courses.

If you have completed fewer than twelve quarter- or semester-units of transferable college credit since high school graduation, you must also satisfy the Examination Requirement for freshman applicants. See "Examination Requirement."

2. If you achieved the required score on the Eligibility Index but did not complete all the "a-f" subjects in high school, you may be minimally eligible for admission to the university after you have:

### INTERSEGMENTAL GENERAL EDUCATION TRANSFER CURRICULUM (IGETC)

#### Summary Outline

Completion of the Intersegmental General Education Transfer Curriculum (IGETC) will permit a student to transfer from a community college to a campus in either the California State University or University of California systems without the need, after transfer, to take additional lower-division, general-education courses.

It should be noted that completion of the IGETC is not a requirement for transfer to CSU or UC, nor is it the only way to fulfill the lower-division, general-education requirements of the CSU or UC prior to transfer. Depending on a student's major and field of interest, the student may find it advantageous to take courses fulfilling the CSU's general-education requirements or those of the UC campus or college to which the student plans to transfer.

<b>English Communication:</b>	One course, English Composition, 3 sem./4-5 qtr.-units; this course is a prerequisite to Critical Thinking One course, Critical Thinking—English Composition, 3 sem./4-5 qtr.-units; strong emphasis on writing; prerequisite: English Composition One course, Oral Communication <sup>a</sup> , 3 sem./4-5 qtr.-units
<b>Mathematics:</b>	One course, Mathematics/Quantitative Reasoning, 3 sem./4-5 qtr.-units
<b>Arts and Humanities:</b>	Three courses, at least one course in arts, and at least one course in humanities, 9 sem./12-15 qtr.-units
<b>Social and Behavioral Sciences:</b>	Three courses in at least two disciplines, social and behavioral sciences, 9 sem./9-11 qtr.-units
<b>Physical and Biological Sciences:</b>	One course in each area, at least one must include a laboratory, two courses, 7-9 sem./9-11 qtr.-units
<b>Language Other than English:</b>	Proficiency equivalent to two years' high school study <sup>b</sup>

<sup>a</sup>For transfer to UC, a course in oral communication is not required.

<sup>b</sup>Students transferring to CSU do not have to meet this requirement.

- a. Established a college grade-point average of 2.0 or better; *and*
  - b. Completed, with grades of C or better, appropriate college courses in the "a-f" subjects you lacked; *and*
  - c. Completed twelve or more quarter- or semester-units of transferable college credit, or have met the Examination Requirement for freshman applicants.
3. If you did not achieve the required score on the Eligibility Index, or did not achieve the required score and lacked required "a-f" subjects, you may be minimally eligible for admission to the university after you have:
- a. Established a college grade-point average of 2.4 or better in transferable courses; *and*
  - b. Completed eighty-four quarter- or fifty-six semester-units of transferable college credit; *and*
  - c. Completed *one* of the following:
    - I. Appropriate college courses, with grades of C or better, in the "a-f" subjects you lacked. Up to two units of high school work in "a-f" subjects will be waived, but transfer applicants must have satisfied the freshman admission requirements in English and mathematics. A unit is equivalent to a one-year course; *or*
    - II. One college course in mathematics, one in English, and one in either U.S. history, a laboratory science, or a foreign language, all with grades of C or better. The course in mathematics must assume a proficiency level equivalent to three years of high school mathematics (i.e., elementary algebra, advanced algebra, and geometry). The course may be trigonometry or a more advanced course in mathematics or statistics for which advanced algebra is a prerequisite. All of the other courses described above must be transferable to the university.

PLEASE NOTE: Each year UCSD receives more applications from eligible transfer students than the campus can accommodate. In addition to satisfaction of UC minimum requirements, only transfer students who have completed *eighty-four or more* transferable quarter-units are considered for admission unless additional standards are met. Priority is given to students transferring from California

community colleges. See "Advanced-Standing Selection."

## TRANSFER ELIGIBILITY

### NON-CALIFORNIA RESIDENTS (MINIMUM REQUIREMENTS)

(Also, see "Transfer Eligibility: California Residents.")

If you met the admission requirements for freshman admission as a nonresident, you will be eligible if you have a GPA of 2.8 or higher in college courses that are accepted by the university for transfer credit.

If you were ineligible from high school only because you did not study one or more of the required subjects, you may be minimally eligible for admission to the university after you have:

1. Established an overall grade-point average of 2.8 or better in another college or university;
2. Completed, with a grade of C or better, appropriate college courses in the high school subjects you lacked; *and*
3. Completed twelve or more quarter- or semester-units of transferable credit, or have met the examination requirement.

If you are a nonresident applicant who graduated from high school with less than a 3.4 grade-point average in the "a through f" subjects required for freshman admission, you must have completed at least eighty-four quarter-units (fifty-six semester-units) of transferable work with a grade-point average of 2.8 or better. In addition, if you lacked any of the required subjects in high school, you must have completed the following:

1. Appropriate college courses, with a grade of C or better, in high school subjects you lacked. Up to two units of high school work in "a-f" subjects will be waived, but transfer applicants must have satisfied the freshman admission requirements in English and mathematics. A unit is equivalent to a one-year course; *or*
2. One college course in mathematics; one in English; and one in either U.S. history, a laboratory science, or a foreign language, all with grades of C or better. The course in mathematics must assume a proficiency level equivalent to three years of high school mathematics. See II above.

## INTERNATIONAL APPLICANTS

Applicants who present evidence of above-average scholarship achievement will be considered for admission.

Courses at UCSD are conducted in English, and every student must have sufficient command of that language to benefit from instruction. To demonstrate such command, students whose native language is not English will be expected to take the Test of English as a Foreign Language (TOEFL). Arrangements for taking this test may be made by writing to the Educational Testing Service, P.O. Box 899, Princeton, New Jersey 08540. The minimum TOEFL score which will be acceptable is 550.

The results of this test will be used to determine whether the applicant's command of English is sufficient to enable him or her to pursue studies effectively at UCSD. Foreign students whose command of English is slightly deficient will be required to take an English course and, therefore, a reduced program.

In addition to an adequate English-language background, foreign students must have sufficient funds available to cover all fees, living, and other expenses, and transportation connected with their stay in the United States (see "Fees and Expenses").

Foreign students are required to obtain health insurance for themselves and dependents who accompany them. Suitable insurance policies and additional information are available at the Student Health Service and at the International Center.

## SECOND BACCALAUREATE/ AND LIMITED STATUS APPLICANTS

Applications received by the Office of Admissions from students who have earned a four-year degree will be reviewed by the college provost's office. Limited status (non-degree-seeking) applicants and those seeking a second B.A. or B.S. will be held to the same restrictions as are other new admits; fields that have been closed for admission (such as engineering) will be closed to these students as well. Students will be screened according to the amount of space available in the college; students will also be screened by any departments that have such screening mechanisms for entrance into the major. Students are accepted on an individual basis, and there is no

guarantee of admission to the college or to a particular major. Applicants seeking a second B.A. or B.S. degree will be given consideration on a space-available basis with a lower priority than all other admits. Applicants for a second B.A. or B.S. will have **limited status** until such time as they have met the prerequisites to the major and have filed a program approved by the major department and have had their proposed program reviewed and approved or disapproved by the college. Limited status students are not awarded on-campus housing.

Limited status students are eligible to apply for a Guaranteed Student Loan if they have not exceeded the duration limit of eighteen quarters of postsecondary attendance. Academic transcripts will be required from all institutions attended *prior* to student financial services certifying of the application.

## HOW TO APPLY FOR ADMISSION

Undergraduate admissions application packets are available from California high school and community college counselors or from any UC campus admissions office. A special application is available for international students. Complete the Undergraduate Application form in this packet. Follow the accompanying directions carefully and mail to:

University of California,  
Application Processing Center  
P.O. Box 23460  
Oakland, CA 94623-0460

A preaddressed envelope is provided with the application.

You may apply to as many as eight campuses of the University of California on one application form.

## APPLICATION FEES

The basic application fee of \$40 entitles you to be considered at one campus of the university. For each additional campus you select, you must pay an extra \$40 fee. These fees are not refundable.

## WHEN TO APPLY FOR ADMISSION

To make sure that you will be considered for admission to the university campus(es) you want to attend, and to the major or program of study you want to pursue, you must file your completed application during the applicable Priority Filing Period (see below).

Each campus of the university accepts for consideration all applications it receives during this period. If you plan to apply for financial aid, university housing, or other special programs where early application is important, you must also file during this time.

### Priority Filing Periods

#### All UC Campuses, except Berkeley

**Fall Quarter 1992:**

**File November 1-30, 1991**

**Winter Quarter 1993:**

**File July 1-31, 1992**

**Spring Quarter 1993:**

**File October 1-31, 1992**

#### UC Berkeley Only

**Fall Semester 1992:**

**File November 1-30, 1991**

**Spring Semester 1993:**

**File July 1-31, 1992**

NOTE: Some campuses do not accept applications for winter and spring. Inquire at the campus Admission Office.

After the priority period has ended, campuses will accept applications *only* if they still have openings for new students. This means that some campuses may be able to accept additional applications, but others may not. If a campus is closed to new students, applicants will be informed that their applications will not be forwarded to that campus. In this case, a portion of the application fee may be refunded if appropriate.

## ADDING A CAMPUS

If, after submitting your application, you wish to add a campus or campuses to the one(s) you first listed on your application, you may do so if the campus or campuses you are considering are still accepting applications. Please contact the Admissions Office on each of these campuses for information on which programs are still open and the procedures for adding campuses.

## SELECTING CAMPUSES AND PROGRAMS OF STUDY

You are encouraged to approach the selection of a university campus or campuses and a program of study very carefully. You may be familiar with only one or two of the university's eight general campuses, probably those nearest to your home or mentioned more frequently in the news. You should seriously consider the

many different educational alternatives and programs offered by other campuses of the university before completing your application. Your counselor and the university staff in Student Outreach and Recruitment offices can provide you with helpful insights that will help you in the selection process.

## COLLEGE CHOICE

The application to San Diego must include a choice of college (Muir, Revelle, Third, Warren, or Fifth) before it can be processed. Selecting alternative college choices is also advisable since each college has enrollment quotas that limit the number of new freshmen and new transfer students. The Admissions Office will select an alternate college if choice is not indicated or available.

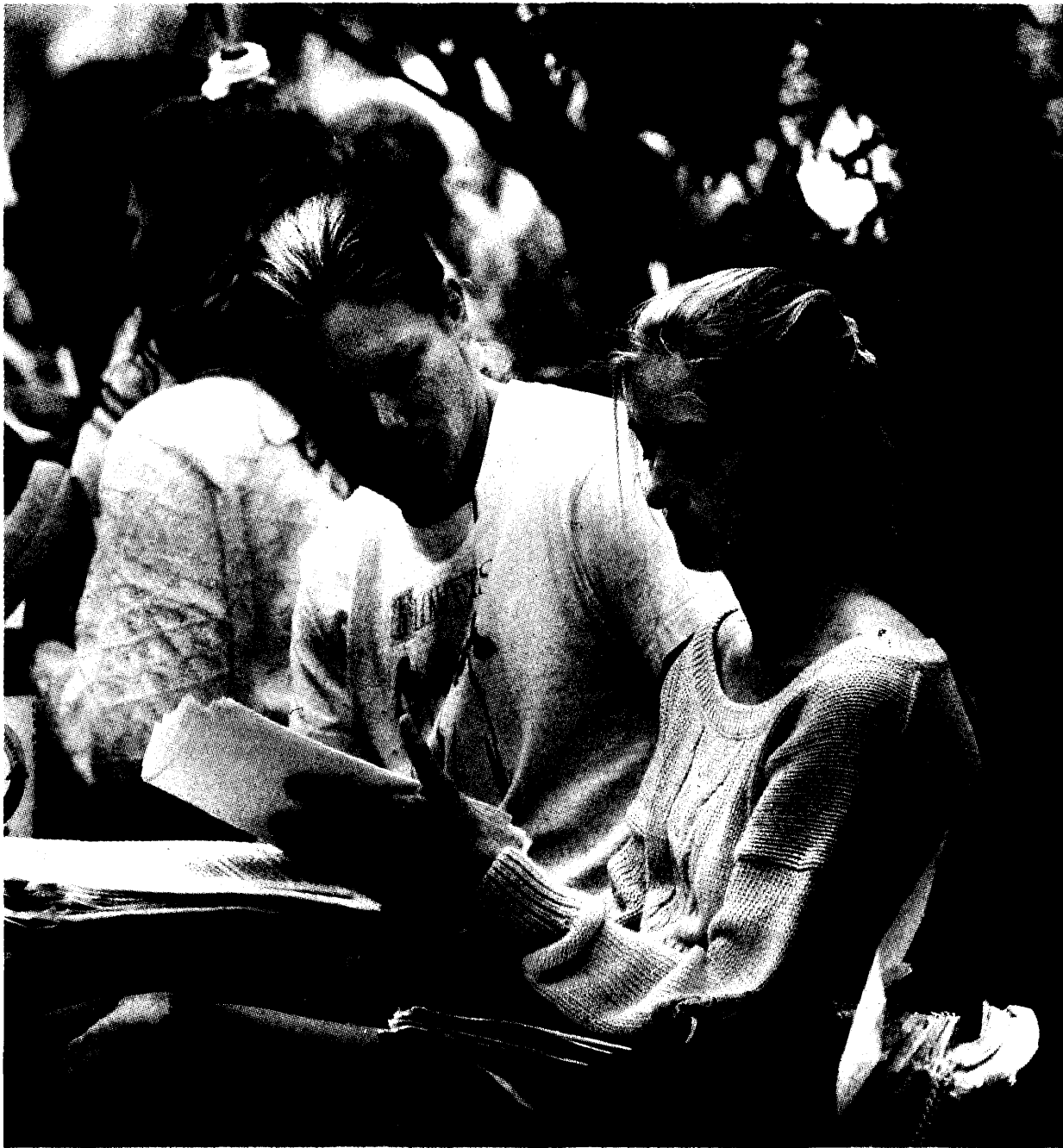
## TRANSCRIPTS

Every applicant is responsible for requesting that the high school of graduation and each college he or she has attended send official transcripts promptly to the Office of Admissions.

If you are still attending high school, please DO NOT send a sixth semester transcript; we will make a decision based on the self-reported academic data you have provided in the application. If admitted, you must arrange to send a final official transcript immediately upon completion that includes final grades and date of graduation, or, if you have passed the High School Proficiency Examination, a verification of your Certificate of Proficiency. If you have completed any college courses while in high school, transfer credit may be granted upon receipt of the college transcript.

If you are applying for admission as a transfer student, the Office of Admissions requires official transcripts from your high school of graduation, from each college you have attended, and a preliminary transcript from your present college, with not more than one term still to be completed, listing your work in progress.

The transcripts and other documents that you submit as part of your application become the property of the university; they cannot be returned to you or forwarded in any form to another college or university.



## CHECKLIST FOR APPLICANTS

1. Fill out the application form completely. You must select a UCSD college in order of preference. Be sure to sign the form.
2. Complete your personal essay and include with the application.
3. Freshmen: Fill in the self-reported academic data and test information carefully and accurately.  
Transfers: You must fill in the self-reported academic record as instructed in the Undergraduate Application packet.
4. Mail application during the filing periods with fee (check or money order payable to The Regents of the University of California) to:  
University of California  
P.O. Box 23460  
Oakland, CA 94623-0460
5. Arrange to take the ACT or SAT test and CEEB Achievement tests if you are a freshman applicant **no later than December of your senior year.**
6. Request that your school(s) send transcripts and other required documents directly to the UCSD Office of Admissions. Final high school transcripts must be on file in the UCSD Office of Admissions by July 15.

### ESTIMATED EXPENSES FOR ON-CAMPUS UNDERGRADUATE RESIDENTS OF CALIFORNIA

Non-California residents should estimate approximately \$2,567 additional tuition fees each quarter.

	FALL QUARTER	WINTER QUARTER	SPRING QUARTER	TOTAL
University Registration Fee*	\$ 231	\$ 231	\$ 231	\$ 693
Educational Fee	527	527	527	1581
Campus Activity Fee	13.50	13.50	13.50	40.50
University Center Fee	37.50	37.50	37.50	112.50
Recreation Facility Fee	12	12	12	36
Board and Room in Residence Halls (Avg.)	2,050	2,051	2,051	6,152
Transportation (Approx.)	192	192	192	576
Books, Supplies (Approx.)	186	186	186	558
Personal Expenses (Approx.)	517	517	517	1,551
<b>Total</b>	<b>\$3,766.00</b>	<b>\$3,767.00</b>	<b>\$3,767.00</b>	<b>\$11,300.00</b>

NOTE: Fees are subject to change by the Board of Regents.

\*Estimated



## NOTIFICATION OF ADMISSION

### *ADMISSION—FRESHMEN*

If you are a fall-term freshman applicant and you filed during the priority filing period, UCSD will notify you whether you have been admitted beginning March 1 and no later than March 15. All offers of admission are provisional until the receipt and verification of your official final high school transcript. If you are offered admission based on your self-reported academic record, your official high school transcript will be used to verify the self-reported academic data you submit. Offers of admissions may be rescinded if there are discrepancies between your official high school transcript and your self-reported academic record; you do not complete the courses listed as "in progress" or "planned" in your twelfth grade; you do not complete your twelfth grade courses at the same academic level you achieved in previous course work.

### *ADMISSION—TRANSFER*

If you are applying to transfer, the campuses may notify you any time between April 1 and May 1. All offers of admission are provisional until the receipt and verification of all official high school transcripts. If you are offered admission based on your self-reported academic record, your official high school transcript and transcripts from all colleges attended will be used to verify the self-reported academic data you submit. Offers of admission may be rescinded if there are discrepancies between your official transcript and your self-reported academic record; any college or school attended is omitted from your academic record; you do not complete the courses listed as "in progress" or "planned;" the specified GPA is not maintained in courses "in progress" or "planned."

**These notification dates apply only to applicants who file within the priority periods.** Applicants for winter and spring quarters are notified as soon as possible following receipt of all appropriate transcripts.

After receipt of notification of admission:

1. Read your admit letter carefully, noting any special provision governing your admission.
2. Request that any outstanding transcripts be forwarded to the Office of Admissions to ensure full matriculation.

3. Complete and return to the Office of Admissions the Statement of Intention to Register (SIR) and the Statement of Legal Residence (SLR). Please note the deadline to return your Statement of Intention to Register. Your admission status may be in jeopardy if the stated deadline is not met. The deadline for return of your SIR and SLR is May 1 for freshmen and June 1 for transfers.

### *STATEMENT OF INTENTION TO REGISTER (SIR)*

Upon receipt of your Statement of Intention to Register (SIR), the Office of Admissions provides information to various campus offices including financial aids, housing, and your college provost. You will then receive additional information from each of these offices. The \$100 nonrefundable fee accompanying your SIR is applied toward payment of the university registration fee the quarter for which you have been admitted. International applicants outside the territorial United States are not required to submit the \$100 deposit with the Statement of Intention to Register.

Even though you may be admitted to more than one campus of the University of California, you can return an Intention to Register to only one campus.

### *COLLEGE ORIENTATION AND REGISTRATION OF NEW STUDENTS*

Prior to the quarter for which they have been admitted, new students will receive information from their colleges regarding orientation and enrollment in classes. Students admitted in the fall quarter will be invited to attend a new-student orientation on the campus during the preceding summer. Academic advising and enrollment in courses will take place during orientation sessions.

### *STUDENT HEALTH REQUIREMENT*

Entering students are required to complete a Medical History form and to send it to the Student Health Center. Forms and complete instructions are usually sent to entering students well in advance of registration, or they may be obtained at the Student Health Center. Information submitted to the Student Health Service is kept confidential and is carefully reviewed to help provide individualized health

care. Students are urged also to submit a physical examination form completed by their family physician, particularly if they plan to take part in intercollegiate athletic competition. Routine physical examinations are not provided by the Student Health Service. An optional student health plan that provides additional benefits off campus may be purchased at the time registration fees are paid. Student health insurance is mandatory for all foreign and graduate level students and is a condition of enrollment.

### *REAPPLICATION*

An application for admission is effective only for the quarter for which it is submitted. If you are ineligible for admission, or if you are admitted and do not register, you must file a new application to be considered for a later quarter. The selection criteria in effect for the new term must be met. If you have been admitted to the university and paid registration fees, but did not attend, contact the Office of the Registrar for readmission information. Review of the new application will be based on requirements in effect at time of readmission or reapplication.

### *FEES AND EXPENSES*

The exact cost of attending the University of California, San Diego will vary according to personal tastes and financial resources of the individual. Generally, the total expense for three quarters, or a college year, is estimated at \$12,000 for California residents living away from home.

It is possible to live simply and to participate moderately in the life of the student community on a limited budget. The best that the university can do to assist the student in planning a budget is to indicate certain and probable expenses. For information regarding student employment, loans, scholarships, and other forms of financial aid at UCSD, see "Campus Services and Facilities" in this catalog.



# UNDERGRADUATE REGISTRATION

## ENROLLMENT IN COURSES

Prior to the quarter for which they have been admitted, new students will receive information from their college regarding orientation dates, course enrollment, and fee-payment deadlines. Enrollment materials will be provided at the college provosts' offices on the days assigned for new students' registration. New freshman students admitted for the fall quarter will be invited to attend a new student orientation during the summer preceding fall quarter. Enrollment in courses will take place at that time.

## NEW STUDENT ORIENTATION

Orientation programs are designed to acquaint students with the nature, functions and purposes of UCSD's college system, and to show students how to deal with a variety of requirements set by the university, college, and academic departments. Although all five colleges have the same goals for students, each has developed its own distinctive program. The professional staffs of Revelle, Muir, Third, Warren, and Fifth have designed their programs for their respective students and the students' parents. During the school year, these same staff members are occupied in counseling continuing students, so they have planned these orientation sessions for the summer, when they can devote 100 percent of their time to becoming acquainted with new students and introducing them to a whole new way of doing things.

Not only will new students be made aware of the opportunities offered by their college and the UCSD community as a whole, they will also receive a great deal of guidance in selecting courses and will register in advance for their first fall quarter classes.

To prepare for the orientation session, students should spend a little time thinking about what they want from their education. If the decision of which major to pursue has not been made, students can benefit by narrowing their choices, eliminating subjects they know they don't want, and selecting areas of possible interest. Students will have a lot of help in making such choices, but anything they can do in advance will make the process easier.

All new students are required to attend an orientation/registration session. Parents' attendance is, of course, optional, but we hope they will want to come. Parents' concerns about life at UCSD are not exactly the same as students', so they will be invited to separate meetings.

In addition to the Summer Orientation, students should attend Welcome Week—the week before the official opening of the fall quarter and the beginning of classes.

## CONTINUING STUDENT ENROLLMENT

Continuing students (those currently registered or eligible to register) should refer to the quarterly *Schedule of Classes* for enrollment information, dates, and fee-payment instructions. The *Schedule of Classes* is published prior to each quarter and may be purchased at the University Bookstore.

## DEFINITIONS

Students are considered enrolled when they have requested space in at least one course and space in classes has been reserved. Students are not considered registered until they have both enrolled in courses and paid registration fees.

Priority enrollment is done by telephone. Continuing students are assigned a start-time to enroll in courses. Priority times are assigned according to number of units completed. Undergraduate student levels are determined by completion of course units:

Freshmen	0–44.9 units
Sophomores	45–89.9 units
Juniors	90–134.9 units
Seniors	135–184 units

Students will receive a *Class Confirmation* based upon the space available at the time of priority enrollment. Students will be held responsible for all courses appearing on the class confirmation and must make any necessary changes by the add/drop process or by appropriate withdrawal.

## DROPPING AND ADDING COURSES

After telephone priority and an open enrollment period by telephone, students may make

any necessary corrections to their class schedules by telephone or by submitting a Drop/Add Card. Students may add courses through the second week of instruction. Please refer to the quarterly *Schedule of Classes* for appropriate approvals required.

After the second week, students may not add courses. However, they may continue to drop courses to the end of the ninth week of instruction. Students who wish to drop *all* their courses are required to file an Undergraduate Withdrawal or Leave form with their college academic advising or dean's office. Please see the W (Withdrawal) grade regulation that applies after the fourth week of instruction.

### Weeks

- 1–2: ADD/DROP—Change Grade Option
- 2–4: DROP—Change Grade Option
- 5–9: DROP ONLY—"W" recorded on transcript
- 10 and later: No changes; final grade assigned

## THE UNDERGRADUATE PROGRAM

The undergraduate program consists of four four-unit courses each quarter, or sixteen units per quarter, for four years. Students must complete a minimum of thirty-six units in three consecutive quarters in order to satisfy the minimum progress requirements (see "Minimum Progress" in the "Academic Regulations" section). Undergraduate students wishing to take more than twenty and one-half units of credit in a quarter will need their college provost's approval.

## APPROVAL FOR ENROLLMENT FOR MORE THAN 200 UNITS

The minimum unit requirement for the bachelor's degree is 184 quarter-units in Revelle College and 180 quarter-units in Muir, Third, Warren, and Fifth Colleges. A student is expected to complete the requirements for graduation within this minimum unit requirement. The bachelor of science degree may require satisfaction of additional units, depend-

ing upon the student's major. Candidates for B.S. degrees in engineering are permitted 230 units (240 for engineering majors in Revelle and Fifth colleges).

Under special circumstances, students may extend their undergraduate training beyond the minimum. Non-engineering students who are attempting to achieve more than 200 quarter-units will not be permitted to register without their college provost's approval. Other exceptions will be granted only for compelling academic reasons and only with the approval of the college provost and the concurrence of the Committee on Educational Policy. Transfer units applicable toward general-education requirements or major requirements are to be included in the maximum unit calculation; all other transfer units are to be excluded. Advanced placement and international baccalaureate units are to be excluded. (See information regarding "Minimum Unit Limitation" in the "Academic Regulations" section of this catalog.)

### **CONCURRENT ENROLLMENT**

Concurrent enrollment in regular sessions at another institution or in UCSD Extension while enrolled on the San Diego campus is permitted only when approved in advance by the provost of the student's college.

### **ENROLLMENT AND REGISTRATION HOLDS**

A student may have a "hold" placed on his or her enrollment or registration (payment of fees) and/or academic transcripts for the following reasons:

1. Failure to respond to official notices.
2. Failure to settle financial obligations when due or to make satisfactory arrangements with the Bursar's Office.
3. Failure to present certification of degrees and/or status on leaving previous institution(s).
4. Failure to comply with admission conditions.

Each student who becomes subject to a hold action is given advance notice and ample time to deal with the situation. However, if the student fails to respond, action will be taken without further notice, and he or she is entitled to no further services of the university, except assistance toward reinstatement.

Undergraduate students wishing to have their status restored must secure a release from the office initiating the hold action. Reinstatement is not final until the registration process is completed.

### **CHANGE OF ADDRESS**

Students who change their local or permanent addresses after enrollment are expected to notify the registrar in writing at once. Change-of-address cards are available at the Office of the Registrar, 301 MAAC (Matthews Administrative and Academic Complex). Students will be held responsible for communications from any university office sent to the last address given and should not claim indulgence on the plea of not receiving the communication.

### **CALIFORNIA RESIDENCE FOR TUITION PURPOSES**

#### **TUITION FEE FOR NONRESIDENT STUDENTS**

If you have not been living in California with intent to make it your permanent home for more than one year immediately before the residence determination date for each term in which you propose to attend the university, you must pay a nonresident tuition fee 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.

#### **LAW GOVERNING RESIDENCE**

The rules regarding residence for tuition purposes at the University of California are governed by the California Education Code and implemented by Standing Orders of the Regents of the University of California. Under these rules, adult citizens and certain classes of aliens can establish residence for tuition purposes. There are particular rules that apply to the residence classification of minors. (See below.)

#### **WHO IS A RESIDENT?**

If you are an adult who is not an alien present in the U.S. in a nonimmigrant status that precludes you from establishing domicile in the U.S. (e.g., a B, C, D, F, H2, H3, J, M, O2, O3, P, or Q visa) and you want to be classified

as a resident for tuition purposes, you must have established residence in California more than one year immediately preceding the residence determination date for the term during which you propose to attend the university, and you must have given up any previous residence. You must also present objective evidence that you intend to make California your permanent home. If these steps are delayed, the one-year durational period will be extended until you have demonstrated both presence and intent for one full year. Physical presence within the state solely for educational purposes does not constitute the establishment of California residence, regardless of the length of your stay. Your residence cannot be derived from your spouse or your parents.

#### **ESTABLISHING INTENT TO BECOME A CALIFORNIA RESIDENT**

Indications of your intent to make California your permanent residence can include the following: registering to vote and voting in California elections; designating California as your permanent address on all school and employment records, including military records if you are in the military service; obtaining a California driver's license or, if you do not drive, a California Identification Card; obtaining California vehicle registration; paying California income taxes as a resident, including taxes on income earned outside California from the date you establish residence; establishing a California residence in which you keep your personal belongings; and licensing for professional practice in California. The absence of these indicia in other states during any period for which you claim residence can also serve as an indication of your intent. Your intent will be questioned if you return to your former state of residence when the university is not in session. Documentary evidence is required, and all relevant indications will be considered in determining your classification.

#### **GENERAL RULES APPLYING TO MINORS**

If you are an unmarried minor (under age 18), the residence of the parent with whom you live is considered to be your residence. If you have a parent living, you cannot change your residence by your own act, by the appointment of a legal guardian, or by the relinquishment of your parent's right of control. If you lived with neither parent, your residence is that of the parent with whom you last lived. Unless you are a minor alien present in the U.S. under

the terms of a nonimmigrant visa that precludes you from establishing domicile in the U.S., you may establish your own residence when both your parents are deceased and a legal guardian has not been appointed. If you derive California residence from a parent, that parent must satisfy the one-year durational residence requirement.

**SPECIFIC RULES APPLYING TO MINORS**

**Divorced/Separated Parents**

You may be able to derive California resident status from a California resident parent if you move to California to live with that parent on or before your eighteenth birthday. If you begin residing with your California parent after your eighteenth birthday, you will be treated like any other adult student coming to California to establish residence.

**Parent of Minor Moves From California**

You may be entitled to resident status if you are a minor U.S. citizen or eligible alien whose parent(s) was a resident of California who left the state within one year of the residence determination date if:

1. you remained in California after your parent(s) departed;
2. you enroll in a California public post-secondary institution within one year of your parent(s)' departure; and
3. once enrolled, you maintain continuous attendance in that institution.

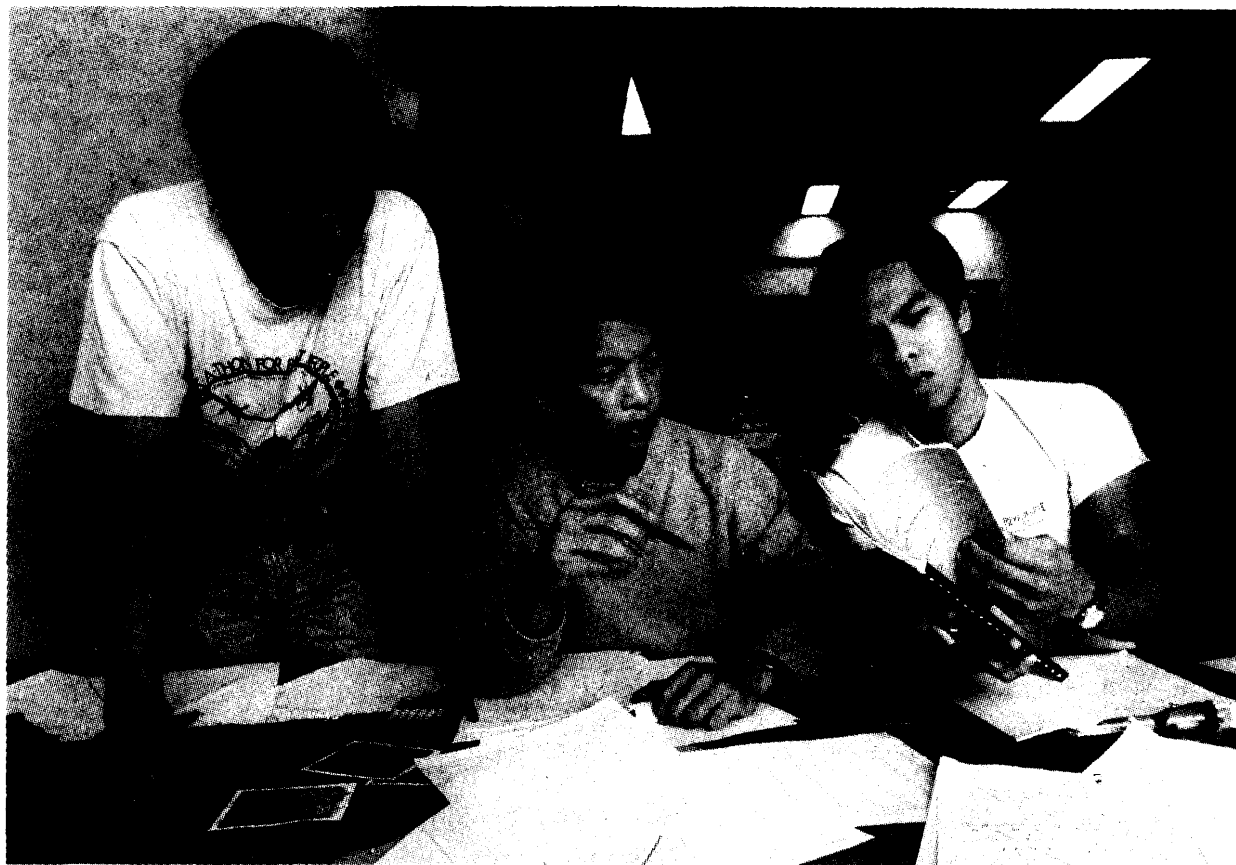
**Self-Support**

You may be entitled to resident status if you are a U.S. citizen or eligible alien and either a minor or age eighteen and can prove the following:

1. you lived in California for the entire year immediately preceding the residence determination date;
2. you have been self-supporting for that year; and
3. you intend to make California your permanent home.

**Two-Year Care and Control**

You may be entitled to resident status if you are a U.S. citizen or eligible alien and you have lived continuously with an adult who is not your parent for at least two years prior to



the residence determination date. The adult with whom you are living must have been responsible for your care and control for the entire two-year period and must have been residing in California during the one year immediately preceding the residence determination date.

**EXEMPTIONS FROM NONRESIDENT TUITION**

**Member of the Military**

If you are a member of the U.S. military stationed in California on active duty, unless you are assigned for educational purposes to a state-supported institution of higher education, you may be exempt from the nonresident tuition fee until you have lived in California long enough to become a resident. You must provide the residence deputy on campus with a statement from your commanding officer or personnel officer stating that your assignment to active duty in California is not for educational purposes. The letter must include the dates of your assignment to the state.

**Spouse or Other Dependents of Military Personnel**

You are exempt from payment of the nonresident tuition fee if you are a spouse or a natural or adopted child or stepchild who is a dependent of a member of the U.S. military stationed in California on active duty. The ex-

emption is available until you have lived in California long enough to become a resident. You must petition for a waiver of the nonresident tuition fee each term you are eligible. If you are enrolled in an educational institution and the member of the military is transferred on military orders to a place outside California where he or she continues to serve in the armed forces, or the member of the military retires from active duty immediately after having served in California on active duty, you may retain this exemption under the conditions listed above.

**Child or Spouse of Faculty Member**

To the extent funds are available, if you are an unmarried dependent child under age twenty-one or the spouse of a member of the university faculty who is member of the Academic Senate, you may be eligible for a waiver of the nonresident tuition fee. Confirmation of the faculty member's membership on the Academic Senate must be secured each term this waiver is granted.

**Child or Spouse of University Employee**

You may be entitled to resident classification if you are an unmarried dependent child or the spouse of a full-time university employee whose assignment is outside of California (e.g., Los Alamos Scientific Laboratory). Your parent's or spouse's employment status

with the university must be ascertained each term.

**Child of Deceased Public Law Enforcement or Fire Suppression Employee**

You may be entitled to a waiver of the nonresident tuition fee if you are the child of a deceased public law enforcement or fire suppression employee who was a California resident at the time of his or her death and who was killed in the course of fire suppression or law enforcement duties.

**Dependent Child of a California Resident**

A student who has not been an adult resident of California for more than one year, and who is the dependent child of a California resident who has been a resident for more than one year immediately prior to the residence determination date, may be entitled to a waiver of the nonresident tuition until the student has resided in California for the minimum time necessary to become a resident. Continuous attendance must be maintained at an institution while the student is establishing residence.

**MAINTAINING RESIDENCE DURING A TEMPORARY ABSENCE**

If you are a nonresident student who is in the process of establishing a residence for tuition purposes and you return to your former home during noninstructional periods, your presence in the state will be presumed to be solely for educational purposes and only convincing evidence to the contrary will rebut this presumption. A student **who is in the state solely for educational purposes will NOT be classified as a resident for tuition purposes regardless of the length of his or her stay.**

If you are a student who has been classified as a resident for tuition purposes and you leave the state temporarily, your absence could result in the loss of your California residence. The burden will be on you (or your parents if you are a minor) to verify that you did nothing inconsistent with your claim of continuing California residence during your absence. Steps that you (or your parents) should take to retain a California residence include:

1. Continue to use a California permanent address on all records—educational, employment, military, etc.

2. Satisfy California resident income tax obligations. (Note: If you are claiming California residence, you are liable for payment of income taxes on your total income from the date you establish California residence. This includes income earned in another state or country.)
3. Retain your California voter's registration and vote by absentee ballot.
4. Maintain a California's driver's license and vehicle registration. If it is necessary to change your driver's license and/or vehicle registration while you are temporarily residing in another state, you must change them back to California within the time prescribed by law.

**RECLASSIFICATION**

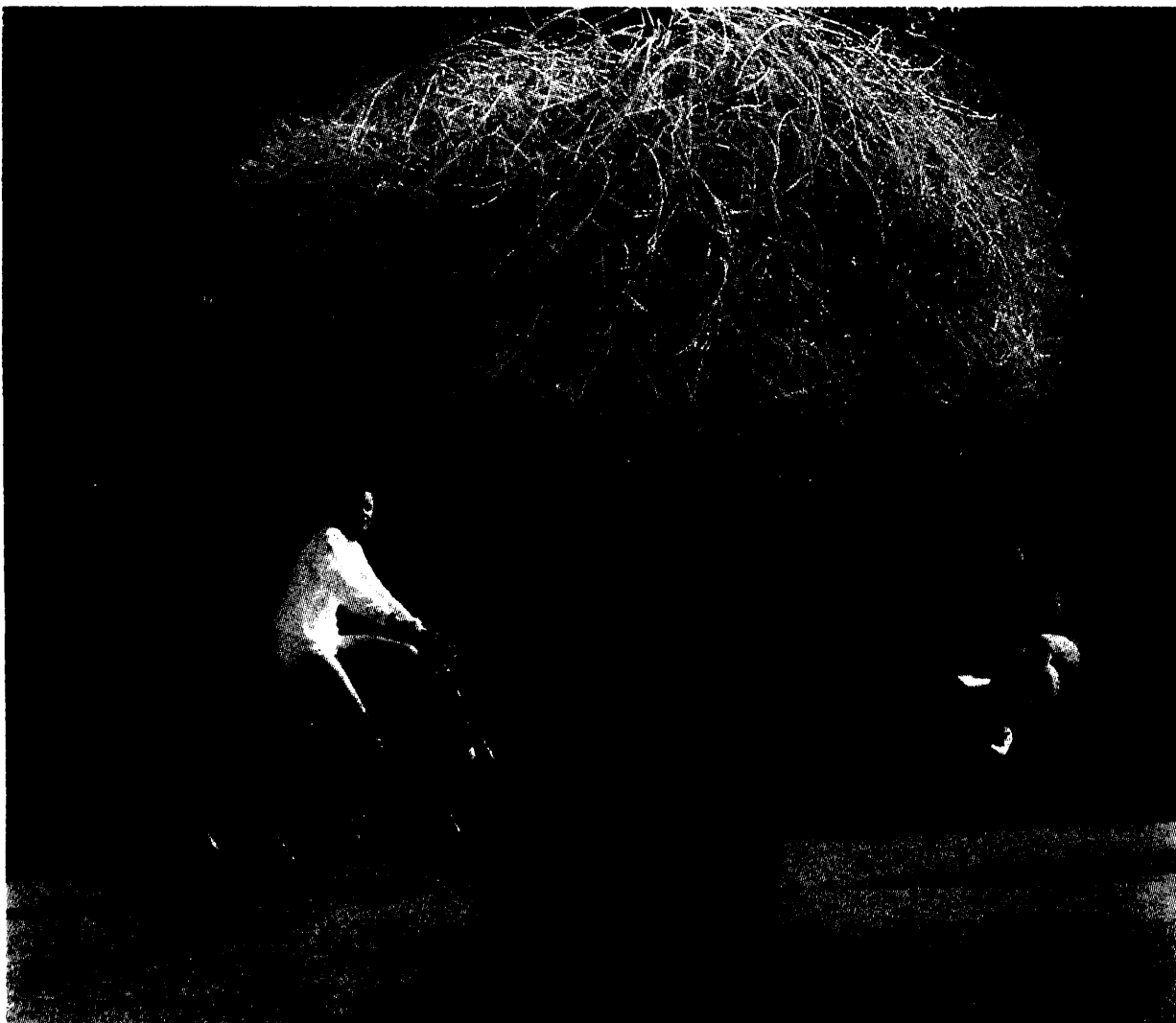
You must petition in person at the Registrar's Office for a change of classification from nonresident to resident status. All changes of status must be initiated prior to the first day of class for the term for which you intend to be reclassified. In addition to the indications listed above, California law requires that financial independence be included among the factors considered if you are seeking reclassification. If you are financially dependent in the current and preceding calendar years, you will be considered a California resident for reclassification purposes only if no factors exist which give evidence of your continuing residence in another state. Financial independence will not be considered for graduate students who are graduate student instructors, teaching assistants, research assistants, or teaching associates employed at 49 percent time or more.

**TIME LIMITATION ON PROVIDING DOCUMENTATION**

If additional documentation is required for either an initial residence classification or reclassification but is not readily accessible, you will be allowed until the end of the applicable term to provide it.

**INCORRECT CLASSIFICATION**

If you were incorrectly classified as a resident, you are subject to reclassification and to payment of all nonresident tuition fees 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 should immediately notify the campus residence deputy.





**INQUIRIES AND APPEALS**

Inquiries regarding residence requirements, determinations, and/or recognized exceptions should be directed to the Residence Deputy, Office of the Registrar, 9500 Gilman Drive, La Jolla, CA 92093-0021, or the Legal Analyst-Residence Matters, Office of the General Counsel, University of California, 300 Lakeside Drive, 7th floor, Oakland, CA 94612-3565. **No other university personnel are authorized to supply information relative to residence requirements for tuition purposes.**

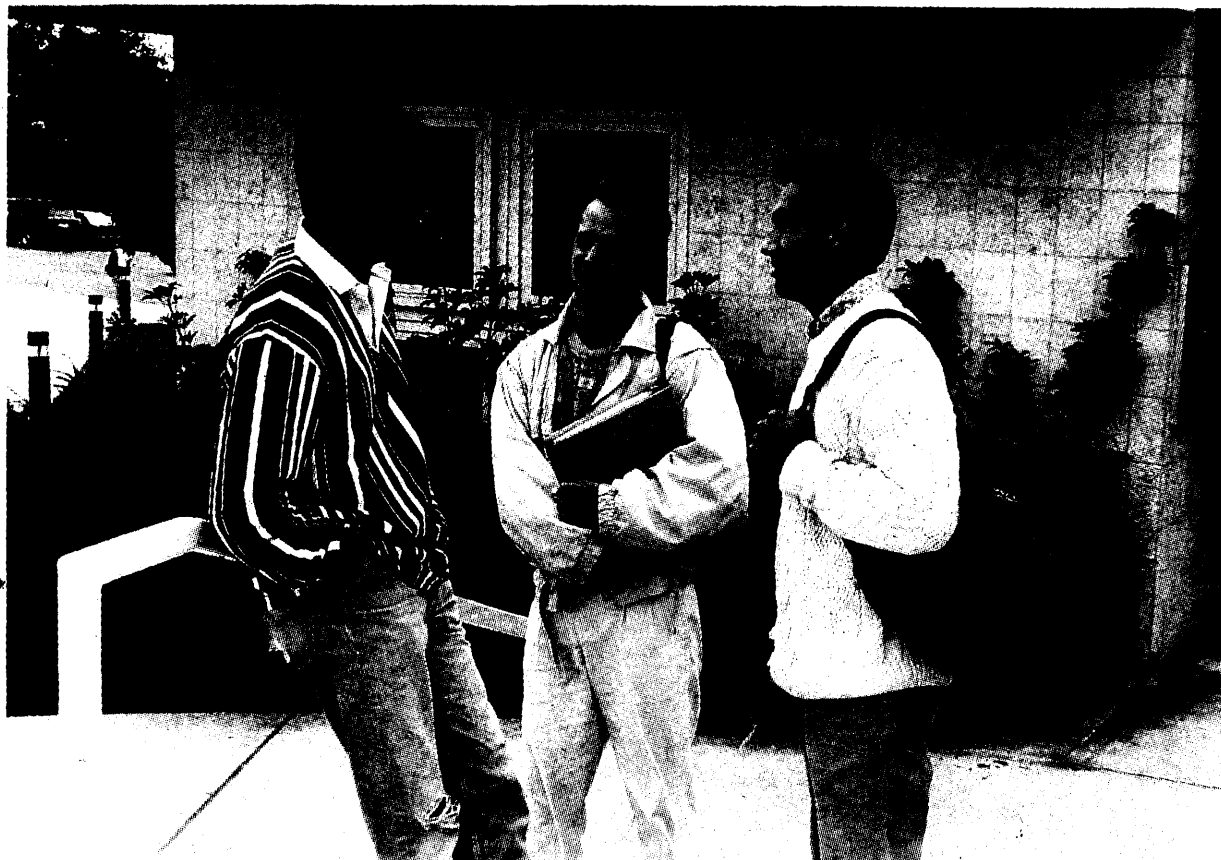
You are cautioned that this summary is **not** a complete explanation of the law regarding residence. Please note that changes may be made in the residence requirements between the publication of this statement and the relevant residence determination date. Any student, following a final decision on residence classification by the residence deputy, may appeal in writing to the legal analyst within ninety days of notification of the residence deputy's final decision.

**PAYMENT OF REGISTRATION FEES**

**BILLING STATEMENT AND PAYMENT INFORMATION**

Registration at UCSD is a two-step process: (1) enrollment in classes and (2) payment of fees. You must enroll first so that your fees can be assessed. You can pay fees anytime after you enroll in classes. A billing statement will be sent to you after enrollment; however, if you wait to enroll just prior to the enrollment deadline, you don't need a billing statement to pay your fees. Write your Social Security number on your check and mail it or drop it in the Central Cashier's drop box.

Your monthly billing statement from the university will list your credits, including your payments, and your charges. This includes registration fees, housing, parking, and other indebtedness. If you are a financial aid recipient, the funds which are disbursed through UCSD, e.g., Pell Grants and Perkins Loans, will be offset against the statement's charges, and you will either pay the remaining amount on the statement or receive a remainder check if there is a credit. If you have any questions about the entries, use the phone numbers listed on the back of the statement to contact the appropriate office.



Billing statements for the 1992-93 academic year will be mailed to your current address.

To make a payment, all that is necessary is to mail the top of your statement to the Central Cashier's Office at the address provided on the statement stub (9500 Gilman Drive, La Jolla, CA 92093-0009).

**It is very important, if you are receiving financial aid, graduate support or university fee waivers, and decide not to attend UCSD, to return the top part of your statement with the back filled out indicating that you will not be attending.** Failure to do this will result in your being automatically registered for classes you will not attend, and F grades may result.

**Financial Aid/Remainder Check Disbursement**

Student financial aid, graduate support, or fee waivers awarded to pay registration fees will be directly credited to your account and appear on your statement as a credit. Financial aid will not be credited to your account until you have completed the enrollment process. Financial aid recipients are expected to be enrolled full-time. The Bursar's Office disburses all financial aid checks to students. These include remainder checks and other forms of financial aid such as outside scholarships, Stafford, and Supplemental Student Loans (SLS). **All Perkins and university loan borrowers must sign their promissory notes**

**each quarter in the Bursar's Office.** Loan funds will not be released (credited) to student accounts until the promissory notes are signed. The number of class units you are taking will be verified by the Bursar's Office staff at the time of disbursement. Additionally, prior to your check being issued it is necessary for you to sign the required legal paperwork and allow at least five working days for the check to be prepared.

**Loan Counseling**

It is required by law and/or university policy that all students receiving loans, including Perkins, Stafford, university, and SLS have a pre-loan counseling session wherein they are informed of the rights, obligations, and consequences attached to the loans. These counseling sessions are called entrance interviews. At these sessions, the students sign documents acknowledging their attendance and understanding of the issues involved. It is also required that all graduating students who have received a loan have final counseling before they leave school. These sessions are called exit interviews. At this time, students are individually told how much they owe on student loans, what their repayment amounts will be, and when their repayments will begin. In both sessions, students are provided with copies of all counseling content and documentation. **You may call for an entrance interview appointment at 619/534-2950.**



## UNDERGRADUATE REGISTRATION

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### Registration and Other Payments through the Central Cashier's Office

Registration payments must be made by mail or in drop box as early as possible. The Central Cashier's Office receives payments for all university debts. It also cashes checks. The mailing address of the Cashier's Office is: **Central Cashier's Office, UCSD, 9500 Gilman Drive, La Jolla, CA 92093-0009. (Make checks or money orders payable to UC Regents.)**

### Registration Stickers

After fees have been paid, students are eligible to pick up their student registration stickers at the Central Cashier's Office or the Bursar's Office. This sticker affixes to the back of your I.D. and certifies you are a UCSD student. The quarterly validation sticker is affixed by the Cashier's Office upon payment of fees, if fees are paid in person. Additionally, a special booth for distribution of the sticker is operated each quarter by the Bursar's Office. After you pay by mail or drop box, wait about five working days in order for your payment to be processed.

### INDEBTEDNESS COUNSELING AND BURSAR HOLD RELEASES

Entering college for the first time can be an overwhelming experience. And part of that experience is learning to handle your own finances. Most students have no real problem, but sometimes things can get out of control. Student Financial Services stands ready to help you with financial assistance. The Billing Services Unit of the Bursar's Office will counsel you on campus indebtedness which you have already incurred and how to prevent such conditions in the future. It is a University of California regental policy that no student can continue in the next academic quarter if that individual owes the university money. Consequently, when a student owes the university money, an automatic **hold** prevents him or her from future registration until the bill is paid. It is recognized that there are occasional problems and situations which may be taken into account. Therefore, on occasion, after counseling, the Bursar's Office may authorize a Time Payment Agreement (TPA) with a student.

### Location

The Bursar's Office is located in two buildings in the Matthews Administrative and Aca-



ademic Complex. The administrative units including check disbursement are adjacent to the Student Financial Services buildings next to the tennis courts. The building number is 211/212. The Central Cashier's Office is immediately southeast of the tennis courts at the intersection of Myers Drive and Rupertus Drive in Building No. 401.

### OFFICE HOURS

Central Cashier's Office is open from 8:30 a.m. until 3:00 p.m.

All other bursar units are open from 9:00 a.m. until 4:00 p.m.

### DEADLINES AND PENALTY FINES

Students should refer to the cover of the quarterly *Schedule of Classes* for actual deadline dates. The deadline to pay fees is the day before instruction begins.

All prior delinquent debts must also be paid. An optional student health insurance plan is available to undergraduate students and can be purchased at the time registration fees are due. (Health insurance is mandatory for all graduate students and all foreign students.) An additional charge will be made for failure to pay required fees or deposits by the

dates announced in this catalog and in the quarterly *Schedule of Classes*. Please note that students who enroll in courses but fail to pay fees prior to the first day of instruction will be assessed a late payment penalty fine. Students who fail to enroll in courses prior to the enrollment deadline will be assessed a late enrollment penalty fine and must receive permission to enroll. Students who fail to enroll and pay fees on time will be assessed both fines. Currently these fines are \$50 each. (See "Miscellaneous Expenses" below.)

With the exception of appeals to the legal analyst-residence matters regarding a student's residence classification, no claim for remission of fees will be considered unless such claim is presented during the fiscal year to which the claim is applicable. Students who wish to appeal a final decision on residence classification by their campus must do so in writing within ninety calendar days of notification of the campus's final decision. Such appeals should be addressed to the Legal Analyst-Residence Matters, Office of the General Counsel, University of California, 300 Lakeside Drive, 7th Floor, Oakland, CA 94612-3565.

Receipts of proof of payment are issued for all payments, and these should be carefully

preserved. No student will be entitled to a refund except after surrender to the Cashier's Office of the student's original receipt, if issued, or cancelled check or money order receipt.

**EXEMPTION FROM FEES**

Except for miscellaneous fees and service charges, no fees of any kind are assessed any surviving child of a California resident who was an active law enforcement or active fire suppression official and who was killed in the performance of active duties or died as a result of an accident or injury caused by external violence or physical force incurred in the performance of such duties.

Students who believe themselves entitled to one of these exemptions must apply for a fee exemption at the Office of the Registrar before registering. Without this authorization, students will not be permitted to register without payment of the entire fee. Graduate students should apply to the dean of Graduate Studies.

**NONRESIDENT TUITION**

Students who have not established and maintained California residence for at least one year immediately prior to the residence determination date for the term during which they propose to attend the university, and who do not otherwise qualify for resident classification under California law, are charged, along with other fees, a nonresident tuition fee each quarter. The residence determination date is the day instruction begins at the last of the University of California campuses to open for the quarter. Final classifications are made by the residence deputy, who is located in the registrar's office, on the basis of a Statement of Legal Residence completed by the student and signed under oath. Prospective students who have questions regarding their residence status should consult the *General Catalog* or contact the residence deputy.

**UNIVERSITY REGISTRATION FEE**

The university registration fee is approximately \$700 per year for undergraduates and must be paid at the time of registration. It covers services that benefit the student and are complementary to, but not a part of, the instructional program, and it includes recreational activities, student organizations, and the Student Health Service. No part of this fee is refunded to students who do not make use of these privileges. Exemption from this fee may be granted for surviving children of cer-

tain deceased California fire fighters or law enforcement officers. Students should check with the Student Financial Services Office for full ruling.

In addition, there is a campus activity fee of \$40.50 per year for undergraduates, a university center fee of \$112.50 per year for all students to be used for the construction and operation of the student centers, and a \$36 per year recreational facility fee. Graduate students are not assessed the campus activity fee, but are assessed a \$15 per year graduate student association fee.

**EDUCATIONAL FEE**

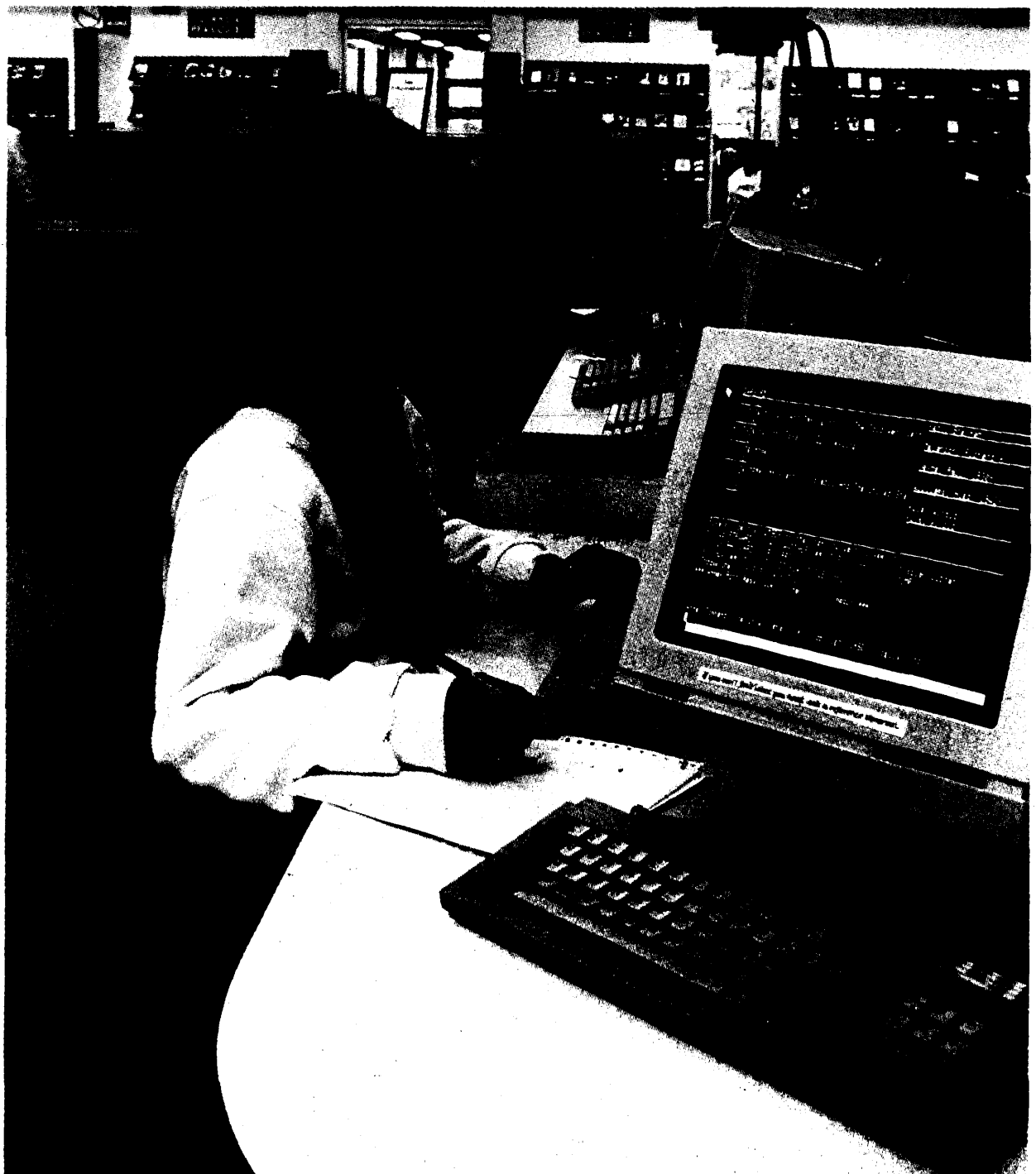
The educational fee was established by the regents for all students beginning fall quarter 1970. The educational fee is a charge assessed against each registered student to

cover part of the cost of the student's education at the University of California. The educational fee is approximately \$1,600 per year. The educational fee may be reduced by one-half for students approved on part-time status.

**MISCELLANEOUS EXPENSES, FEES, FINES, AND PENALTIES**

Books and supplies average about \$200 per quarter. However, students should be aware of the following possible expenses:

Statement of Intent to Register fee (new undergraduate)	\$100
Application fee (one campus)	40
Each additional campus	40
Duplicate Photo I.D. Card	10
Request to Receive/Remove Grade "I"	5
Transcript of record	3



## UNDERGRADUATE REGISTRATION

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Late filing of announcement of candidacy for B.A.	3
Late enrollment	50
Return check collection	10
Late payment of fees (late registration)	50
Duplicate diploma	22

(See also "Withdrawal from the University.")

### RETURNED CHECK POLICY

Several facilities at UCSD accept personal checks for payments and/or cash. Any individual who writes checks with insufficient funds will be subject to all legal action deemed appropriate by the university. In addition, anyone who writes to the university three or more checks that are subsequently returned will have their check writing privileges permanently revoked.

### Parking

Students who park motor vehicles on the campus are subject to parking fees. Parking permits are sold at the Cashier's Office. A copy of the campus parking regulations may be obtained from the cashier at the time of permit purchase.

## PART-TIME STUDY AT THE UNIVERSITY OF CALIFORNIA

### General Policy

1. Degree programs in the university may be open to part-time students wherever good educational reasons exist for so doing.
2. No majors or other degree programs will be offered only for part-time students, except as specifically authorized by the Academic Senate.
3. For the purposes of this statement of policy and procedures, the following definition applies:

A part-time undergraduate student is one who is approved to enroll for ten units or fewer, or an equivalent number of courses, per quarter.

### Admissions and Enrollment

1. The same admissions standards that apply to full-time students will apply to part-time students.
2. Approval for individual students to enroll on a part-time basis will be given for reasons of occupation, family responsibilities, or health.

3. Approval to enroll as a part-time student shall be given by the appropriate dean or provost.
4. Students must apply for part-time study prior to the end of the second week of the quarter *and* must be enrolled in ten or fewer units at that time (*including* any units taken through UCSD Extension) to qualify for reduced fees.

### PROCEDURES

Students must apply for part-time status on the Part-Time Study application form available in the Office of the Registrar or colleges *prior to the end of the second week of the quarter*. Approval for part-time study is granted for one academic year only—fall through spring quarters, winter through spring quarters, or spring quarter only. Students must reapply for approval each fall quarter and substantiate reasons for request. Approval for part-time study will automatically exempt students from the thirty-six unit-per-year minimum progress requirement. Students who are receiving financial assistance should contact their college financial aid office regarding eligibility requirements.

### REDUCED FEES

Undergraduate students who have been approved for part-time study and who are enrolled in ten units or fewer at the end of the second week of classes are eligible for a reduction of one-half of the educational fee and one-half of nonresident tuition, if applicable. Students who drop to ten or fewer units after this date will receive no reduction, and any student who receives a reduction in fees will be billed for the difference if the number of units increases to ten and one-half or more anytime in the quarter.

Undergraduates enrolled in Education Abroad and other special programs are excluded from this reduced fee policy. Employees of the university enrolled as students in the Employee Program have fees reduced by waiver from the Personnel Office and are not eligible to receive this further reduction. Extension courses taken by students in the Complimentary Enrollment Program *will* be included in the unit count whether or not the credit is accepted as part of a university degree program. Questions concerning this policy may be addressed to the Office of the Registrar.



# ACADEMIC REGULATIONS

## UNDERGRADUATE DEGREE REQUIREMENTS

Each of the undergraduate colleges on the San Diego campus has specific requirements for a degree. (See "Choosing a College at UCSD.")

## CHANGES IN REQUIREMENTS

It is campus policy to introduce changes in graduation requirements so that students who began higher education (at UCSD or elsewhere) before the change will not be hindered substantially in the orderly pursuit of their degrees. This principle will have different implications for different kinds of requirement changes. To find out about the implications of particular changes, students should check with colleges, departments, or other sources of information.

Students transferring to UCSD from another UC campus who have completed their lower-division general-education requirements at a UC campus are considered to have met UCSD's lower-division general-education requirements. UCSD upper-division general-education requirements must be satisfied. (See "Graduation Requirements" for each undergraduate UCSD college.)

Students transferring to UCSD from California State or Community College campuses may elect to satisfy their lower-division general-education and breadth requirements prior to transfer by completing the Intersegmental General Education Transfer Agreement. See "New University of California Transfer Agreements" in the "Undergraduate Admissions, Policies and Procedures" section of this catalog.

## REQUIREMENTS FOR THE BACHELOR'S DEGREE

All work required for a degree must be completed by the end of the quarter filed for graduation.

Every candidate for a bachelor's degree must have completed a major.

1. A major shall require the equivalent of twelve or more upper-division courses (forty-eight or more units).
2. Requirements for majors shall be determined by departments and programs, subject to the approval of the Committee on Educational Policy.
3. **Double Majors:** With the approval of both departments or programs and of the college provost, a student in good standing may declare a double major. Except in unusual cases and with the approval of the Committee on Educational Policy, the two majors may not be within a single department, nor may a departmental major be combined with a major in an interdepartmental or interdisciplinary program associated with that department.

a. A student with a double major must fulfill the separate requirements of each major, and the equivalent of at least eight upper-division courses (thirty-two units) must be unique to each major. Courses taken in fulfillment of lower-division requirements may overlap to any degree.

b. Both majors and degrees will be noted on the student's transcript and one diploma.

c. A student who has declared a double major may not graduate in one major prior to the completion of all requirements for both majors.

4. An undergraduate student must have declared a major or pre-major upon completion of ninety units.

Other requirements for graduation shall be determined by the colleges in conformity with universitywide regulations and subject to approval by the San Diego Division of the Academic Senate.

## AMERICAN HISTORY AND INSTITUTIONS

A knowledge of American history and of the principles of American institutions under the federal and state constitutions is required of all candidates for the bachelor's degree. This requirement may be met in any one of the following ways:

1. By having passed with a grade of C or better one high-school unit in American history,

or one-half high-school unit in American history and one-half high-school unit in civics or American government.

2. By completing with a grade of P or C — or better any one-quarter course of instruction accepted as satisfactory by the Committee on Educational Policy and Courses. Any of the following courses are suitable for fulfilling the requirement: HILD 2A-B-C, HILD 7A-B-C, HIUS 100, HIUS 101, HIUS 112, HIUS 120, HIUS 121, HIUS 122, HIUS 123, HIUS 130, HIUS 131, HIUS 140, HIUS 141, HIUS 150, HIUS 151, or HIUS 152; and Political Science 10, 100A, 100B, 100C, 102C, 102H, 104A, 110E A&B, 110J, 142A.

3. By presenting proof of having received a score of 500 or more on the CEEB Achievement Test in American History.

4. By presenting proof of having received a grade of 3 or higher on the Advanced Placement Test in American History administered by the Educational Testing Service, Princeton, New Jersey.

5. By presenting proof of having satisfied the present requirement as administered at another collegiate institution within the state.

6. By presenting proof of successful completion of a one-quarter or one-semester course, with a grade of C or better, in either American history or American government at a community college within state.

7. By presenting proof of successful completion of a one-quarter or one-semester course, with a grade of C or better, in either American history or American government at a recognized institution of higher education, junior college included, in another state.

8. An alien attending the university on an F-1 or J-1 student visa may, by showing proof of temporary residence in the United States, petition for exemption from this requirement through the office of his or her college provost.

## SUBJECT A: ENGLISH COMPOSITION

The University of California requires all undergraduate students (including international students) to demonstrate a minimum proficiency in English composition (the Subject A



requirement). This proficiency can be demonstrated by:

1. Submitting a score of 600 or better on the English Composition Test, an achievement test of the College Entrance Examination Board (CEEB) (Note: not to be confused with the verbal portion of the Scholastic Aptitude Test [SAT]); or
2. Submitting a score of 3, 4, or 5 on the CEEB Advanced Placement Test in English; or
3. Submitting proof of completion, prior to enrollment at UCSD, of a transfer-level college course of four quarter-units or three semester-units in English composition with a grade of C or better; or
4. Submitting proof of scoring a "Pass for Credit" on the California State University English Equivalency Examination (Note: the CSU English Placement test may *not* be used to satisfy the Subject A requirement); or
5. Writing a passing essay on the Subject A Proficiency Test (which is *required* of all students who have not otherwise met the requirement). This exam is administered statewide during May and on campus at the start of fall quarter. *This examination may be taken only once.*

All students who have not previously satisfied the Subject A requirement must take the Subject A Proficiency Test prior to enrollment at UCSD. Students who fail this examination must enroll each quarter in an approved Subject A course until they satisfy the Subject A requirement. Students satisfy the requirement by achieving a grade of C or better in SDCC 1 (English Composition—Subject A) and by passing the Subject A Exit Examination at the end of SDCC 1. The Exit Examination is administered by the Subject A Program office. Students whose performance on the Subject A Proficiency Test indicates they need work in English as a Second Language *must* enroll in ESL courses for three quarters (or until released by the ESL director) *before* enrolling in SDCC 1. Students must enroll in SDCC 1 (or ESL) during their first quarter of residence at UCSD. For further information on SDCC 1, refer to "Subject A" in the catalog section "Courses, Curricula, and Programs of Instruction." For further information on ESL, see "English as a Second Language" in the catalog section "Courses, Curricula, and Programs of Instruction."

The Subject A requirement must be satisfied during a student's first year of residence. Stu-

dents will be barred from enrollment at the university if they fail to satisfy the Subject A requirement by the end of their third quarter of enrollment at UCSD. (Exception: Students in need of ESL course work may have up to three extra quarters of residence in which to satisfy the Subject A requirement.)

Students will not be allowed to enroll in university-level writing courses at UCSD until the Subject A requirement has been satisfied.

Students who have been barred from enrollment because of failure to satisfy Subject A will be allowed to represent evidence of further work in composition. If the Subject A director approves, these students may take a Subject A examination a final time. Students performing successfully on this final examination will be eligible to apply for reenrollment at the university.

For further information about the Subject A requirement or the Proficiency Test, please visit the Subject A Program office, 3232 Literature Building, or call (619) 534-6177.

### SENIOR RESIDENCE

Each candidate for the bachelor's degree must complete thirty-six of the final forty-five units in residence in the college or school of the University of California in which the degree is to be earned.

Under certain circumstances, such as when a student attends classes on another UC campus as an approved visitor or participates in the UC Education Abroad Program or the San Diego Opportunities Abroad Program, exceptions may be granted by the provost.

Note: Courses taken through the UCSD Extension Concurrent Enrollment Program will not apply toward a UCSD student's senior residency requirement. For further details see "Graduation Requirements" in the Index.

### MAXIMUM UNIT LIMITATION

1. An undergraduate student may register for no more than 200 course units. An exception is permitted for candidates for B.S. degrees in engineering, for whom the limits are 240 units in Revelle and Fifth Colleges and 230 units in all other colleges. Other exceptions will be granted only for compelling academic reasons and only with the approval of the college provost and the concurrence of the Committee on Educational Policy.

2. Transfer units applicable toward general-education requirements or major requirements

are to be included in the maximum unit calculation; all other transfer units are to be excluded. Advanced Placement and international baccalaureate units are to be excluded.

Special kinds of study—e.g., laboratories, reading programs, studio work—may be required in addition to the basic course work in given curricula.

### GRADUATION CREDIT FOR PHYSICAL EDUCATION COURSES

No more than three units of physical education, whether earned at UCSD or transferred from another institution, may be counted toward graduation.

### UNDERGRADUATE MINORS AND PROGRAMS OF CONCENTRATION

A minor curriculum—or "minor" for short—is a set of six courses on a well-defined subject, at least three of which must be upper-division courses. In the case of a subject that is the responsibility of a particular department, such as literature, physics or sociology, that department specifies which courses are acceptable for a minor curriculum in its section of this *General Catalog*. All other minor curricula must be approved by the Committee on Educational Policy and be published in this *General Catalog*. A student may not apply toward the minor any course that has been used to satisfy the requirements of his or her major curriculum. A student's successful completion of a minor curriculum will be recorded on his or her transcript at graduation.

Certain colleges require their students to complete one or more "programs of concentration" before graduation, and the courses or types of courses acceptable for programs of concentration are determined by the faculty of the college or a subcommittee thereof. A program of concentration is not necessarily a minor. Indeed, a program of concentration is a minor only if it meets the criteria in the above paragraph, and only then may it be listed on a student's transcript as a minor. Otherwise it will be recorded as a concentration at graduation.





## HONORS

### COLLEGE HONORS AT GRADUATION

The Academic Senate has established the following standards for award of college honors at graduation:

There shall be a campus-wide requirement for the award of college honors at graduation. No more than 14 percent of the graduating seniors on campus shall be eligible for college honors. Normally, no more than the top 2 percent shall be eligible for *summa cum laude* and no more than the next 4 percent for *magna cum laude*, although minor variations from year to year shall be permitted. The remaining 8 percent are eligible for *cum laude*. The ranking of students for eligibility for college honors shall be based upon the grade-point average. In addition, to be eligible for honors, a student must receive letter grades for at least eighty quarter-units of course work at the University of California. Each college may award honors at graduation only to those who are eligible to receive college honors.

### DEPARTMENT HONORS

Each department or program may award honors to a student at graduation if the following two criteria are met:

1. The student has completed a *special* course of study within the department or program. The requirements for this special course of study shall be approved by CEP and published in the *General Catalog*.

2. No more than 20 percent of the seniors graduating from a department or program may be awarded departmental honors.

Honors awarded by departments may be designated on the diploma by the words "with distinction," "with high distinction," and "with highest distinction" after the departmental or program name. Currently the departments and majors listed below are approved to award honors to no more than 20 percent of graduating seniors: Anthropology, Biology, Chinese Studies, Economics, Quantitative Economics and Decision Sciences, History, Judaic Studies, Linguistics, Literature, Muir Special Project, Music, Philosophy, Political Science, Psychology, and Sociology.

### PROVOST HONORS

Provost honors are awarded quarterly based upon the completion of twelve *graded* units with a GPA of 3.5 or higher with no grade of D, F, or NP recorded for the quarter.

### PHI BETA KAPPA

Phi Beta Kappa is the oldest, most prestigious honor society for the liberal arts and sciences in America. UCSD is one of only 240 four-year institutions granted chapters since the society was founded in 1776. In addition, there are fifty active PBK alumni associations in major cities around the country.

More than 200 current UCSD faculty and staff were initiated at their own undergraduate colleges. Each spring the campus chapter elects student members on the basis of high

scholastic achievement and breadth of academic background. Minimal criteria for consideration include:

1. Enrollment at UCSD for five continuous quarters.
2. Successful completion of at least 160 quarter-units.
3. GPA of 3.65 or higher.
4. A strong grounding in the humanities (the equivalent of six courses in history, literature, or philosophy).
5. Completion of college-level courses in mathematics or quantitative science.
6. Proficiency in a foreign language.

In considering a student for membership, the reviewers consider the excellence of the academic record, the breadth and quality of the courses taken, and evidence that the student has pursued a serious line of work and is of good character. Invitations to membership are by letter, usually in late May, and initiation takes place in early June.

### PHI BETA DELTA HONOR SOCIETY FOR INTERNATIONAL SCHOLARS

Phi Beta Delta is an honor society for international scholars. Its membership includes distinguished faculty who have achieved recognition in international endeavors such as teaching, administration, research, or services to international students and scholars; foreign students who have demonstrated high scholastic achievement at their institutions (graduate and upper-division students); and U.S. students who have demonstrated high scholastic achievement in pursuit of academic studies abroad or through participation in comparable international programs or experiences. Nominations for membership received from deans and department chairs are evaluated by a subcommittee. The chair of the Academic Senate Committee on Education Abroad Program and International Education was named acting president. Governance, nominations, and program committees were appointed, and the society now joins the ranks of other honor societies on the UCSD campus.

### APPLICATION FOR DEGREE

Undergraduate seniors are required to file an Application for a Degree form with their college academic advising office. Students should check with their college academic advising office for exact deadlines. Advising and

## ACADEMIC REGULATIONS

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counseling sessions should take place well before the quarter of graduation to ensure all degree requirements will be satisfied. Applications not on file by the deadline are subject to special approval, a \$3 late filing fee, and a \$22 special-order diploma fee. Students who have not completed all degree requirements by the end of the quarter filed for graduation must file a new application. Failure to file this petition may delay the graduation date and receipt of diploma.

### SPECIFIC REGULATIONS

#### PROGRESS TOWARD DEGREES

In order to apply the units of a course toward unit requirements for a degree, a student must receive an A, B, C, D, P, or S grade in the course. (Plus or minus suffixes (+/-) may be affixed to A, B, and C.) Further, an undergraduate student must have a 2.0 or higher grade-point average (GPA) to receive a bachelor's degree, and a graduate student must have a 3.0 or higher GPA to receive a higher degree.

#### PROBATION

An undergraduate student is subject to academic probation if at the end of any term his or her GPA for that term or his or her cumulative GPA is less than 2.0.

#### SUBJECT TO DISQUALIFICATION

An undergraduate student is subject to academic disqualification from further registration if at the end of any term his or her GPA for that term is less than 1.5 or if he or she has completed two successive terms on academic probation without achieving a cumulative GPA of 2.0. Continued registration of an undergraduate who is subject to disqualification is at the discretion of the faculty of the student's college or its authorized agent (generally the provost/Office of the Provost).

If a student is not currently in scholastic good standing or has been denied registration for the next ensuing quarter on the date on which he or she left the university, a statement of his or her status shall accompany his or her transcript. A student who has been disqualified from further registration at the University of California may not register for UCSD courses through Summer Session, through UCSD Extension by way of the concurrent en-

rollment mechanism, or in UCSD Extension courses offered at the 100 level. Students receiving financial assistance should refer to information in the Student Financial Services section of this catalog. Unique scholarship eligibility requirements must be met.

NOTE: Veteran students receiving financial assistance from the Veterans Administration should refer to unique requirements set by state approving agencies. See veterans' information under Student Financial Services.

#### MINIMUM PROGRESS

A full-time undergraduate student is subject to disqualification from further registration if he or she does not complete thirty-six units in any three consecutive quarters of enrollment. Continued registration of an undergraduate who is subject to disqualification due to lack of minimum progress is at the discretion of the faculty of the student's college or its authorized agent (generally the provost/Office of the Provost).

Eligible students may file for an exemption from the minimum progress requirement by completing the Part-time Study application and receiving college approval *prior* to the end of the second week of the quarter. (See "Part-time Study at the University of California.")

#### DOUBLE MAJORS

See "Requirements for the Bachelor's Degree" in this section.

#### REPETITION OF COURSES

Repetition for credit of courses not so authorized by the appropriate Committee on Courses is allowed subject to the following limitations:

1. A student may *not* repeat a course for which a grade of A, B, C, I, P, or S is recorded on his or her transcript. (Plus or minus suffixes (+/-) may be affixed to A, B, and C.)
2. Courses in which a grade of D or F has been awarded may not be repeated on a P/NP or S/U basis.
3. Undergraduate students may repeat a course in which a grade of NP has been awarded for a P/NP or letter grade, if applicable. Graduate students may repeat a course in which a grade of U has been awarded on an S/U basis only.
4. Repetition of a course for which a student's transcript bears two or more entries with

grades among D, F, NP, or U requires approval of the appropriate provost or dean.

5. All grades received by a student shall be recorded on the student's transcript.

6. The first sixteen units of courses that have been repeated by an undergraduate student and for which the student received a grade of D, F, NP, or U shall not be used in grade-point calculations on a student's transcript.

NOTE: Although the University of California grade-point average will not include these repeated courses, other institutions/graduate programs, and agencies may recalculate the grade-point average to reflect all assigned grades.

#### SPECIAL STUDIES COURSES

Subject to the limitations below, a student may earn credit for supervised special studies courses on topics of his or her own selection. An undergraduate taking one or more special studies courses must complete an application for each such course before the start of the course.

#### COURSE NUMBER

Ordinarily, special studies courses are numbered 197, 198, or 199. The 197 course is for individually arranged field studies. The 198 course is for directed group study. The 199 course is for individual independent study.

#### LIMITATIONS

1. Enrollment requires the prior consent of the instructor who is to supervise the study and the approval of the department chair. The applicant shall show that his or her background is adequate for the proposed study.
2. A student must have completed at least ninety units of undergraduate study and must be in good academic standing (2.5 grade-point average or better).
3. A student may enroll for no more than a total of four units of 198 and 199 Special Studies courses in one term.
4. On the advice of the instructor(s) and the department chair(s) concerned, the provost of a student's college may authorize exceptions to the limitations listed in 2. and 3. above.
5. Only a grade of P or NP is to be assigned for a 197, 198, or 199 course.
6. Subject to the approval of the CEP Subcommittee on Undergraduate Courses, a de-

partment may impose additional limitations on its supervised special studies courses.

### PROCEDURES

1. Students must complete an "Application for UCSD Special Studies Course Enrollment," available in department offices, and secure instructor and department chair approval.
2. Students must secure the department stamp on a Preferred Enrollment Request or Add/Drop Card to enroll or add a class.
3. A final grade will not be assigned to a student unless a copy of the approved application is on file in the Office of the Registrar.

### UNDERGRADUATE ASSISTANCE IN COURSES

An undergraduate instructional apprentice is an undergraduate student who serves as an assistant in an undergraduate course under the supervision of a faculty member. The purpose of the apprenticeship is to learn the methodology of teaching through actual practice in a regularly scheduled course.

### GUIDELINES

1. An undergraduate instructional apprentice shall be an upper-division student. He or she shall be involved only with lower-division courses.
2. Students are not permitted to assist in courses in which they are enrolled.
3. An undergraduate instructional apprentice must have a minimum grade-point average of 3.0. Departments may establish higher grade-point average requirements.
4. The faculty instructor is responsible for course content and for maintaining the overall quality of instruction, including supervision of undergraduate instructional apprentices. The faculty instructor is responsible for all grades given in the class.
5. The instructor is expected to meet regularly with the undergraduate apprentice to evaluate the student's performance and to provide the direction needed for a worthwhile educational experience.
6. An undergraduate instructional apprentice may receive credit on a Pass/Not Pass basis only (through registration in a 195 course), subject to approval by the Committee on Educational Policy.

7. A student may not be an instructional apprentice more than once for the same course for credit.

8. A student may not be an instructional apprentice in more than one course in a quarter.

9. The total credit accumulated as an apprentice shall not exceed eight units.

### PROCEDURE

All departments/programs using undergraduate instructional apprentices shall submit to the CEP Subcommittee on Undergraduate Courses a description of the role of the undergraduate instructional apprentice, as part of the petition for approval. Any deviation from the guidelines above must be explained and justified in a memo accompanying the petition. Any major change in the function or duty of the apprentice in a course should also be approved by the CEP Subcommittee on Undergraduate Courses.

### WRITING REQUIREMENTS

A student may register in an upper-division course only if the student has satisfactorily completed the writing requirement of his or her college or has obtained the consent of the instructor of the upper-division course. The requirement is waived for a student who has been admitted as a transfer student and has not completed three quarters of residence at UCSD.

### FINAL EXAMINATIONS

Final examinations are obligatory in all undergraduate courses except laboratory courses, or their equivalent, as individually determined by the Committee on Courses.

Each such examination shall be conducted in writing whenever practical and must be completed by all participants within the announced time shown in the *Schedule of Classes* for the quarter in question. These examinations may not exceed three hours in duration.

In laboratory courses, the department concerned may, at its option, require a final examination subject to prior announcement in the *Schedule of Classes* for the term.

It is the policy of the university to make reasonable efforts to accommodate students having bona fide religious conflicts with scheduled examinations by providing alternative times or methods to take such examinations. If a student anticipates that a scheduled

class meeting or examination will occur at a time at which his or her religious beliefs prohibit participation in the class or examination, the student must submit to the instructor, *no later than the end of the second week of instruction of the quarter*, a statement describing the nature of the religious conflict and specifying the days and times of conflict together with documentation of the religious proscription and of the student's adherence to this religious belief. Upon determination that a conflict with the student's religious beliefs does exist, the instructor will attempt to provide an alternative, equitable examination procedure which does not create an undue hardship for the instructor.

### RETENTION OF EXAMINATION PAPERS

Instructors are required to retain examination papers for at least one full quarter following the final examination period, unless the papers have been returned to the students.

### CREDIT BY EXAMINATION

With the instructor's approval and concurrence by the student's provost, a currently enrolled and registered undergraduate student in good standing may petition to obtain credit for some courses by examination. Credit by examination is intended for students who study the course material on their own and then petition for credit by examination when they feel they are prepared. The examination will cover work for the entire course. Except as authorized by the instructor and appropriate provost, credit by examination may not be used to repeat a grade of D, F, or W. A part-time student who, by registering to take a course credit by examination, surpasses the number of units allowed for part-time status must pay fees as a full-time student. Credit by examination is not available to students during summer sessions. There will be a \$5 fee for each Credit by Examination petition.

### USE OF STUDENT PETITION

For exceptional circumstances, students may request approval for variances to regulations and policies. This should be done by filling out an Undergraduate Student Petition (available in the provosts' offices or the Office of the Registrar), securing the necessary approvals, and filing the petition with the provost of the student's college.

**GRADING POLICY**

Grades in undergraduate courses are defined as follows: A, excellent; B, good; C, fair; D, poor; F, fail; I, incomplete (work of passing quality but incomplete for good cause); and IP (In Progress courses approved for more than a one-quarter sequence). The designations P (Pass) and NP (Not Pass) are used in reporting grades for some undergraduate courses. P denotes a letter grade of C- or better. NR indicates no record or no report of grade was received from the instructor. W is recorded on the transcript indicating the student withdrew or dropped the course sometime between the beginning of the fifth week of a quarter to the end of the ninth week of a quarter. (See "The W Grade").

Instructors have the option of assigning plus (+) and minus (-) suffixes to the grades A, B, and C. This option became available as of fall 1983.

**GRADE POINTS**

For each student, the registrar will calculate a grade-point average (GPA) over courses taken at any campus of the University of California, not including Extension courses. Grade points per unit will be assigned as follows: A=4, B=3, C=2, D=1, F=0. When attached to the grades of B and C, plus (+) grades carry three-tenths of a grade point more per unit. The grade of A+, when awarded, represents extraordinary achievement but does not receive grade-point credit beyond that received for the grade of A. When attached to the grades of A, B and C, minus (-) grades carry three-tenths of a grade point less per unit than the unsuffixed grades. Courses in which an I, IP, P, NP, S, U, or W grade has been awarded will be disregarded in grade-point calculations. A graduate student's GPA will be calculated over courses taken while in graduate standing.

Grade	Grade Points	Grade	Grade Points
A+	4.0	C+	2.3
A	4.0	C	2.0
A-	3.7	C-	1.7
B+	3.3	D	1.0
B	3.0	F	0
B-	2.7		

The grade-point average is computed by dividing the total number of grade points earned by the total unit value of courses attempted.

At the end of each quarter, the instructor of each course will assign a letter grade to each student who was enrolled in that course at the end of the ninth week of instruction on the basis of the work required for the entire course. An I grade may be assigned, if appropriate.

For each student the registrar will calculate a grade-point average (GPA) over courses taken at any campus of the University of California, not including UCSD Extension courses. A graduate student's GPA will be calculated over courses taken while in graduate standing.

**CHANGES IN GRADES**

All grades except I and IP are final when filed by instructors on end-of-term grade reports. However, a final grade may be corrected when a clerical or procedural error is discovered. *No change of a final grade may be made on the basis of revision or augmentation of a student's work in the course. No term grade except Incomplete may be revised by further examination. No grade may be changed after one calendar year from the time it was recorded. Petitions for exceptions are referred to the Committee on Educational Policy.*

**NO REPORT/NO RECORD**

An NR appearing on student transcripts in lieu of a grade indicates that the student's name appeared on a grade report but no grade was assigned by the instructor. An NR entry will lapse automatically into an F, NP or U if not removed or replaced by a final grade by the last day of instruction of the subsequent quarter, and will be computed in the student's GPA.

**PASS/NOT PASS**

The Pass/Not Pass option is designed to encourage undergraduate students to venture into courses which they might otherwise hesitate to take because they are uncertain about their aptitude or preparation. Consistent with college policy, an undergraduate student in good standing may elect to be graded on a P/NP basis in a course. No more than one-fourth of an undergraduate student's total course units taken at UCSD and counted in satisfaction of degree requirements may be graded on a P/NP basis. Departments may require that courses applied toward the major be taken on a letter-grade basis. Enrollment under this option must take place within the first two weeks of the course. A grade of Pass shall be

awarded only for work which otherwise would receive a grade of C- or better. Units passed shall be counted in satisfaction of degree requirements, but such courses shall be disregarded in determining a student's grade-point average. (See "Physical Education Credit toward Graduation.")

If students wish to change their selected grading option after enrolling, they may use the Telephone Registration system (T-Reg) or may complete an Add/Drop/Change card and file it at the Registrar's Office. The last day to change grading options is the end of the fourth week of instruction.

Only a grade of P or NP is to be assigned for courses numbered 195, 197, 198, and 199. Subject to the approval of the CEP Subcommittee on Undergraduate Courses, departments may impose additional limitations or restrictions.

Only a grade of P or NP is to be assigned an undergraduate student's work in a noncredit (0-unit) course.

NOTE: See "Choosing a College at UCSD" section for further information regarding the P/NP grading option.

**THE W GRADE**

When a student withdraws from the university or drops a course, other than a laboratory course, between the beginning of the fifth week of instruction and the end of the ninth week of instruction of a quarter, the registrar will assign a W to the student for each course affected. When a student drops a laboratory course after the second laboratory session, the registrar will assign a W to the student for the course. Only the registrar may assign a W.

Courses in which a W has been entered on the student's transcript will be disregarded in determining a student's grade-point average.

**ADDING AND DROPPING COURSES AND THE W GRADE**

A student may, with the approval of the instructor (and adviser, if required), add a course to the study list before the end of the second week of instruction of a quarter.

A student may drop a course before the end of the ninth week of instruction by filing the appropriate form with the registrar, after first notifying the instructor and/or department.

A student who wishes to drop all courses is required to file an Undergraduate Request for Withdrawal form with the college academic advising or dean's office.



1. A course dropped before the end of the fourth week of instruction will not be entered on the student's transcript.
2. If a student drops a course after the end of the fourth week of instruction and before the end of the ninth week of instruction, the registrar will assign a final grade of W to the student for that course.
3. A student may not drop a course after the end of the ninth week of instruction.

When an instructor has assigned a grade in a course in accordance with the Academic Senate policy on Integrity of Scholarship prior to the end of the ninth week of instruction, that grade may not subsequently be changed by dropping the course or withdrawing from the university.

### WITHDRAWING FROM SCHOOL AND THE W GRADE

A student may withdraw from the university before the end of the ninth week of instruction of a quarter.

1. If a student withdraws before the end of the fourth week of instruction, no course entries will appear on the student's transcript for that quarter.
2. If a student withdraws after the end of the fourth week of instruction and before the end of the ninth week of instruction, the registrar will assign a final grade of W to the student for each course in which the student was enrolled at the beginning of the fifth week of instruction.
3. Each student will receive a final grade for each course in which the student was enrolled at the end of the ninth week of instruction of the quarter.

When an instructor has assigned a grade in a course in accordance with the Academic Senate policy on Integrity of Scholarship prior to the end of the ninth week of instruction, that grade may not subsequently be changed by dropping the course or withdrawing from the university.

### THE IN PROGRESS (IP) GRADE

For exceptional and compelling reasons, a course extending over more than one quarter may be authorized with the prior approval of the Committee on Educational Policy and Courses (for undergraduate courses) or the Graduate Council (for graduate courses). In

such courses an evaluation of a student's performance may not be possible until the end of the final term. In such cases the instructor may assign the provisional grade IP (in progress).

IP grades shall be replaced by final grades if the student completes the full sequence. The instructor may assign final grades, grade points, and unit credit for completed terms when the student has not completed the entire sequence provided that the instructor has a basis for assigning the grades and certifies that the course was not completed for good cause. An IP not replaced by a final grade will remain on the student's record.

In calculating a student's grade-point average, grade points and units for courses graded IP shall not be counted. However, at graduation, courses still on the record as graded IP must be treated as courses attempted in computation of the student's grade-point average in assessing a student's satisfaction of Senate Regulation 634.

### THE INCOMPLETE (I) GRADE

Academic Senate regulations state that the incomplete grade I for undergraduates shall be disregarded in determining a student's grade-point average, except at point of graduation, when students must have an overall 2.0 (C) on all work attempted at the University of California. All work required for a degree must be completed by the end of the quarter the student filed for graduation. Students requesting an "I" grade the last quarter before graduation may have their graduation date delayed.

Undergraduate students whose work is of non-failing quality but incomplete for good cause, such as illness, must file a Request to Receive/Remove Grade Incomplete form.

Graduate students enrolled in graduate courses may request instructors to assign the grade of "Incomplete" in order to be permitted to complete required work within the following quarter. If the required work is not submitted by the end of the quarter following so that the grade can be reported by the instructor, the grade will automatically be changed to one of "Failure" by the registrar. Graduate students must file a Request to Receive/Remove Grade Incomplete form.

1. Students should complete their portion of the request form, including the reason they are requesting the Incomplete.

2. The instructor has the option to approve or disapprove the request and should state on the form *how* and *when* the I is to be completed.
3. There is a \$5 processing fee, payable to the Cashier's Office, which should be paid by the student *prior* to filing the form with the instructor.
4. Students must complete the work to remove the Incomplete on or before the date agreed upon with the instructor and in time for the instructor to assign a grade **before the end of finals week the following quarter.**
5. Failure to complete this work within the regulation time limit will result in the Incomplete lapsing to a *permanent* F, NP, or U grade.

### INTENDED USE OF THE INCOMPLETE

The Incomplete is intended for use when circumstances *beyond a student's control* prohibit taking the final exam or completing course work due in the last week of classes.

The Incomplete is *not* intended as a mechanism for allowing a student to retake a course. A student who has fallen substantially behind and needs to repeat a course can drop the course prior to the end of the ninth week of classes. Otherwise, the instructor should assign the appropriate final grade (D, F, NP, or U, for example).

An Incomplete may not be used simply to allow a bit more time for an undergraduate student who has fallen behind for no good reason. An I may be granted *only* to students who have a legitimate excuse for missing a final exam or work due in the last week of classes.

### EXTENSION OF INCOMPLETE

For justifiable reasons, such as illness, students can petition their provost or graduate office to extend the Incomplete past one quarter. These petitions must have the prior approval of the *instructor and the department chair*. The petition must include the reasons for requesting the extension and *how* and *when* the I is to be completed. These petitions must be filed **before** the Incomplete grade lapses to an F, NP, or U grade. *The extension cannot be made retroactively.*

An I grade may be replaced upon completion of the work required by a date agreed upon with the instructor, but no later than the last day of finals week in the following quarter. If not replaced by this date, the I grade will



lapse into an F, NP, or U grade, depending upon the student's initial grading option.

A student who has received an I grade should *not* re-enroll in the course to make up the missing work. If the student were to re-enroll, the course would be considered a repeat and would not remove the prior quarter's Incomplete, which would lapse to a *permanent* F, NP, or U grade.

### STUDENT COPY OF FINAL GRADES

The Office of the Registrar will mail copies of final grades to students as soon as possible at the end of each quarter. Fall and winter quarter grades will be mailed to the local mailing address on file for undergraduates and to the major department for graduate students. Spring quarter grades will be mailed to all students' permanent addresses. Students should examine this copy of their transcript record for accuracy and should report any omissions or errors to the Office of the Registrar immediately.

### TRANSCRIPT REQUESTS

Application for an official transcript of record to be sent to another party or institution should be submitted to the registrar several days in advance of the time needed. An application for a transcript must bear the student's signature. A \$3 fee is charged per copy. Checks should be made payable to the Regents of the University of California.

### GRADE APPEALS

- A. 1. If a student believes that nonacademic criteria have been used in determining his or her grade in a course, he or she may follow the procedures described in this regulation.
- 2. *Nonacademic criteria* means criteria not directly reflective of academic performance in this course. It includes discrimination on political grounds or for reasons of race, religion, sex, or ethnic origin.
- 3. Appeals to this committee [see (B)(4)] shall be considered confidential unless both the complainant and the instructor agree otherwise. They may agree to allow the student representatives to the committee to participate in the deliberations of the committee, or they may agree to open the deliberations to members of the university community.

- B. 1. The student may attempt to resolve the grievance with the instructor within the first month of the following regular academic quarter.
- 2. If the grievance is not resolved to the student's satisfaction, he or she may then attempt to resolve the grievance through written appeal to the department chair or equivalent, who shall attempt to adjudicate the case with the instructor and the student within two weeks.
- 3. If the grievance still is not resolved to the student's satisfaction, he or she may then attempt to resolve the grievance through written appeal to the provost of the college, the dean of Graduate Studies, or the dean of the School of Medicine, who shall attempt to adjudicate the case with the instructor, the chair, and the student within two weeks.
- 4. If the grievance is not resolved to the student's satisfaction by the provost or dean, the student may request consideration of the appeal by the CEP Subcommittee on Grade Appeals (hereinafter called the Committee) according to the procedures outlined below. This request must be submitted before the last day of instruction of the quarter following the quarter in which the course was taken.
- C. 1. The student's request for Committee consideration should include a written brief stating the nature of the grievance, including copies of any and all documents in his or her possession supporting the grievance. The submission of the brief to the Committee places the case before it and restricts any change of the challenged grade to a change initiated by the Committee, unless the Committee determines that all other avenues of adjudication have not been exhausted.
- 2. Upon receipt of the student's request, the Committee immediately forwards a copy of it to the instructor involved and asks the instructor, the department chair or equivalent, and the provost or dean for written reports of their attempts to resolve the complaint.
- 3. The Committee, after having determined that all other avenues of adjudication have been exhausted, shall review the brief and the reports to determine if there is substantial evidence that nonacademic criteria were used.

- a. If the Committee finds substantial evidence that nonacademic criteria were used, it shall follow the procedure in paragraph (D) below.
- b. If the Committee decides the allegations are without substance, it shall serve written notification of its findings to the complainant and to the instructor within two weeks. Within ten days the complainant or the instructor may respond to the findings and any member of the Committee may appeal the Committee's findings to the full Committee on Educational Policy and Courses. If there are no responses, or if after consideration of such responses the Committee sustains its decision, the grade shall not be changed.
- D. 1. If the Committee determines that there is evidence that nonacademic criteria were used, it shall interview any individual whose testimony might facilitate resolution of the case. The complainant shall make available to the Committee all of his or her work in the course which has been graded and is in his or her possession. The instructor shall make available to the Committee all records of student performance in the course and graded student work in the course which is still in his or her possession. The complainant and the instructor shall be interviewed. At the conclusion of the case each document shall be returned to the source from which it was obtained.
- 2. The Committee shall complete its deliberations and arrive at a decision within two weeks of its determination that evidence of the use of nonacademic criteria had been submitted. A record of the Committee's actions in the case shall be kept in the Senate Office for three years.
- 3. If the allegations of the complainant are not upheld by a preponderance of the evidence, the Committee shall so notify the complainant and the instructor in writing. Within one week of such notification, the complainant and the instructor shall have the opportunity to respond to the findings and the decision of the Committee. If there are no responses, or if after considering such responses the Committee sustains its decision, it shall so notify the complainant and the instructor in writing and the grade shall not be changed.

4. If the Committee determines that non-academic criteria were significant factors in establishing the grade, it shall give the student the option of either receiving a grade of P or S in the course or retroactively dropping the course without penalty. A grade of P or S awarded in this way shall be acceptable towards satisfaction of any degree requirement, even if a minimum letter grade in the course had been required, and shall not be counted in the number of courses a student may take on a P/NP basis. If the student elects to receive a grade of P or S, the student may also elect to have a notation entered on his or her transcript indicating that the grade was awarded by the divisional grade appeals committee.

- a. The Committee shall serve written notification of its finding and its decision to the complainant and the instructor. The complainant and the instructor may respond in writing to the findings and the decision of the Committee within one week of such notification.
- b. If there are no responses, or if after considering such responses the Committee sustains its decision, the grade shall be changed; the Committee shall then instruct the registrar to change the grade to P or S or, if the student elected the drop option, to retroactively drop the course from the student's record. Copies of the Committee's instruction shall be sent to the complainant and the instructor.

E. These procedures are designed solely to determine whether nonacademic criteria have been used in assigning a grade, and if so to effect a change of that grade.

1. No punitive actions may be taken against the instructor solely on the basis of these procedures. Neither the filing of charges nor the final disposition of the case shall, under any circumstances, become a part of the personnel file of the instructor. The use of nonacademic criteria in assigning a grade is a violation of the Faculty Code of Conduct. Sanctions against an instructor for violation of the Faculty Code may be sought by filing a complaint in accordance with San Diego Division By-Law † 230(D). A complaint may be filed by the student or by others.

2. No punitive actions may be taken against the complainant solely on the basis of these procedures. Neither the filing of charges nor the final disposition of the case shall, under any circumstances, become a part of the complainant's file. The instructor may, if he or she feels that his or her record has been impugned by false or unfounded charges, file charges against the complainant through the office of the vice chancellor for Student Affairs, the dean of Graduate Studies, or the associate dean for Student Affairs of the School of Medicine.

### UCSD POLICY ON INTEGRITY OF SCHOLARSHIP

The principle of honesty must be upheld if the integrity of scholarship is to be maintained by an academic community. The university expects that both faculty and students will honor this principle and in so doing protect the validity of university grading. This means that all academic work will be done by the student to whom it is assigned, without unauthorized aid of any kind. Officers of instruction, hereinafter called instructors, for their part, will exercise care in planning and supervising academic work so the honest effort will be encouraged.

### ACADEMIC DISHONESTY

No student shall engage in any activity that involves attempting to receive a grade by means other than honest effort; for example:

- 1. No student shall knowingly procure, provide, or accept any materials that contain questions or answers to any examination or assignment to be given at a subsequent time.
- 2. No student shall complete, in part or in total, any examination or assignment for another person.
- 3. No student shall knowingly allow any examination or assignment to be completed, in part or in total, for himself or herself by another person.
- 4. No student shall plagiarize or copy the work of another person and submit it as his or her own work.
- 5. No student shall employ aids excluded by the instructor in undertaking course work.
- 6. No student shall, without proper permission, alter graded class assignments or examinations and then resubmit them for regrading.

### RESPONSIBILITY

Instructors should state the objectives and requirements of each course at the beginning of the term, clearly informing students what kinds of aid and collaboration, if any, on assignments are permitted. Students are ex-



pected to complete the course requirements in compliance with the standards described above.

The primary responsibility for maintaining the standards of academic honesty rests with two university authorities: the faculty and the administration. When a student has admitted to or has been found guilty of a violation of the standards of academic honesty, two separate actions shall follow. The instructor shall determine the student's grade on the assignment and in the course as a whole. The recommended academic consequence of a serious breach of academic honesty is failure in the course, although less serious consequences may be incurred in less serious circumstances. The dean of the student's college (or the assistant dean of Graduate Studies or the dean of students in the School of Medicine) shall impose an administrative penalty. Under normal circumstances, the recommended minimum administrative penalties are probation for the first offense and suspension or dismissal for a subsequent offense. The transcript of a student who is dismissed for academic dishonesty shall bear a notation that readmission is contingent upon approval from the chancellor.

**PROCEDURES**

The procedure for disposition of cases of academic dishonesty is divided into three phases:

A. *The Initial Phase:* When an instructor suspects a student of having committed a dishonest act in completing an assignment, he or she shall call the student to a meeting to discuss the charges, the evidence, and the proposed academic consequence. The instructor shall also inform the appropriate college dean (or the assistant dean of Graduate Studies or the dean of students at the School of Medicine). The dean shall then call the student to a meeting to discuss the case and the proposed administrative penalty. (Alternatively the instructor may choose to meet initially with the student and the dean together to discuss the case and the proposed academic and administrative penalties.) At the meeting with the dean, the student shall be advised in writing by the appropriate dean of the charges and of his or her rights under the UCSD Policy on Integrity of Scholarship.

The student shall have ten calendar days following the meeting with the dean to decide whether (1) to accept the charge of academic dishonesty and the proposed academic conse-

quences and administrative penalties, (2) to deny the charge of dishonesty and to proceed to a formal hearing as provided in Paragraph B, or (3) to accept the charge of dishonesty but to appeal the proposed actions as provided in paragraphs D and E. Unless the student informs the dean and the instructor otherwise within this ten-day period, he or she shall be presumed to have taken decision (1). If decision (1) is taken, a record of the academic consequences and administrative penalties shall be maintained in the offices of the appropriate dean, and a copy of the record shall be sent to the chair of the department in which the violation occurred.

B. *The Hearing Phase:* If within ten calendar days of his or her meeting with the dean the student denies having committed the alleged act of academic dishonesty and requests in writing a formal hearing, the case shall be referred by the dean to the chair of the department in which the alleged violation occurred. Within ten calendar days the chair shall appoint an ad hoc committee composed of three faculty members from within the department or a related field and two students—either graduate students or seniors—from within or without the department to hear the case. The ad hoc committee shall hold a formal hearing within ten calendar days of its appointment and decide on the basis of the preponderance of evidence whether the student did engage in academic dishonesty. A hearing officer, selected from a board consisting of the student conduct coordinator and college deans, shall conduct the hearing and shall advise the ad hoc committee on procedure, but shall not vote. The ad hoc committee shall be governed by the general university rules of procedural due process. Within five calendar days from the date the hearing is completed, the hearing offices shall forward the ad hoc committee's findings with explanations to the appropriate dean, or designee, with copies to the department chair, the instructor, and the accused student. Within five calendar days after receipt of the notice of the ad hoc committee's final judgment in the case, the appropriate dean shall inform the student in writing of the findings of the committee and the administrative actions taken.

If the ad hoc committee finds the evidence insufficient to sustain the charge of academic dishonesty, the dean and the instructor shall dismiss the matter without further action

against the student, who shall be permitted to complete the course without prejudice or withdraw from it. If the student withdraws from the course, it shall not be listed on his or her transcript.

C. *The Appeals Phase:*

1. If the ad hoc committee sustains the charge of academic dishonesty, an undergraduate student may appeal that judgment in writing to the appropriate college provost within fifteen calendar days from the date of the notice from the dean. A graduate student shall submit an appeal to the dean of Graduate Studies. A medical student shall submit an appeal to the dean of the School of Medicine. The basis for appeal of the ad hoc committee's judgment shall be:

- a. that the standards of procedural fairness were violated, e.g., that the student did not have sufficient opportunity to present his or her side of the case; or
- b. that there exists newly discovered important evidence that has substantial bearing on the findings of the ad hoc committee.

If the appeal is sustained, the case shall be referred back to the ad hoc committee, reconstituted if necessary, for new hearing. Except for such appeals, the finding of the ad hoc committee shall be final.

2. Within three calendar days of receipt of the dean's letter, the student may appeal the instructor's determination of the academic consequence, as provided in paragraph D, the dean's administrative penalty as provided in paragraph E, or both.

D. *Request for Reduction of Academic Action:*

A request for review of the academic action taken under paragraph A may be directed to the CEP Subcommittee on Grade Appeals. If the case has been heard by an ad hoc committee, the CEP Subcommittee on Grade Appeals shall receive the report of the ad hoc committee and accept its findings as to the facts of the case.

E. *Request for Reduction of Administrative Penalty:*

An appeal of the dean's administrative penalty under the provisions of paragraphs A or C shall be directed by an undergraduate student to the provost of his or her college, by a graduate student to the dean of Graduate Studies, or by a medical student to the dean of the School of Medicine.

**F. Other Governing Policy:**

1. If the case has not been adjudicated before the end of the quarter, the instructor shall give the student no grade in the course, but shall put a faculty hold in the memoranda column of the grade report. While the case is pending, the student may not drop the course in which he or she is accused of dishonesty.
2. If a case has not been adjudicated before the end of the quarter, the case may be continued the next regular academic quarter.
3. If the student withdraws from the university before the final disposition of the case, the following policy shall govern. If the student is found to have committed an act of academic dishonesty and the instructor assigns him or her a final grade in the course, this grade shall be permanently entered on the transcript. If the administrative penalty is dismissal, this fact shall be noted on the transcript. Any administrative penalty less severe than dismissal shall be imposed when the student returns to the university.
4. If the final decision in the case results in dismissal of the student, a record of the case and its outcome shall be established in the office of the vice chancellor for Student Affairs, the dean of Graduate Studies, or the vice chancellor for Health Sciences. The student's transcript shall bear the entry "Dismissed for Academic Dishonesty."

**SPECIAL PROGRAMS****EDUCATION ABROAD PROGRAM AND THE OPPORTUNITIES ABROAD PROGRAM**

Please refer to the "Courses, Curricula, and Programs of Instruction" section of this catalog, where the Education Abroad Program and the Opportunities Abroad Program are described in full.

**INTERCAMPUS TRANSFER (ICT)**

An undergraduate in good academic standing who is now, or was previously, registered in a regular session at any campus of the University of California and has not since regis-

tered at any other institution may apply for admission as a transfer in the same status to another campus of the university.

**HOW TO APPLY**

Intercampus transfers must complete the University of California Undergraduate Application form. These forms are available in the Office of the Registrar. You may apply to one or to as many as eight UC campuses of the university using one application form. Send your completed application to:

University of California  
Admissions Application Processing Service  
P.O. Box 23460  
Oakland, CA 94623-0460

Mail only your application form, fees, and essay to the processing service address above. Send your transcripts, test scores, and all other correspondence relating to your application directly to the Admissions Office at the university campus(es) to which you apply. The processing service will not forward them.

**APPLICATION FEES**

The basic application fee of \$40 entitles you to apply to one university campus. If you apply to more than one campus, you must pay an additional \$40 for each campus you select. These fees are not refundable.

**WHEN TO APPLY**

Priority dates for filing applications for intercampus transfer are identical to the application filing dates for new students: fall, November 1-30; winter, July 1-31; and spring, October 1-31. UC Berkeley fall semester, November 1-30; spring semester, July 1-31.

A campus will accept applications after the priority period only if it still has openings. If you apply after the priority filing period to a campus that is no longer accepting applications, the Admissions Application Processing Service will notify you by mail that your application will not be forwarded to that campus. In this case, you may receive a full or partial refund of the application fee.

**INTERCAMPUS VISITOR (ICV)**

Qualified undergraduates may take advantage of educational opportunities on other campuses of the University of California as an Intercampus Visitor (ICV). This program is designed to enable qualified students to take courses not available on their home campus,

to participate in special programs, or to study with distinguished faculty members on other campuses of the university. Students who meet the following requirements should complete an application available in the Office of the Registrar.

1. An undergraduate student must have completed at least one year in residence on the home campus and have maintained a grade-point average of at least 2.0 (or equivalent) to apply as an intercampus visitor.
2. Approval of the appropriate provost office is required.

If students meet the above conditions, they should complete the ICV application form and return it to the Office of the Registrar on the home campus, on or before the appropriate deadlines listed above for an intercampus transfer (ICT). The ICV application is subject to approval of the host campus.

A nonrefundable fee of \$40 is charged for each ICV application.

**ROTC**

UCSD does not have an ROTC program. Students may, however, with the permission of their college, enroll in ROTC courses at another institution in conjunction with completing their degree programs at UCSD. Through an agreement with the Navy, Air Force, and Army ROTC and the University of San Diego and San Diego State University, qualified students at UCSD may participate in the programs given at these universities.

ROTC courses are conducted on the campuses of the University of San Diego and San Diego State University (College of Extended Studies) for the Navy and USMC ROTC, and at San Diego State University for Army and Air Force ROTC. Field training is conducted off campus as is the Flying Instruction Program, which is conducted at a local civilian flying school. Summer training is required for all students during one or more summers.

Upon completion of the program and all requirements for a bachelor's degree at UCSD, cadets are commissioned as second lieutenants in the Air Force, Army, or Marine Corps, or as ensigns in the Navy. Further information on these programs may be obtained from the ROTC adviser at the Aerospace Studies Department, 594-5545, and the Military Science Department, 265-4943, at San Diego State University or the Department of Naval Science, 260-4811, at the University of San Diego. In-



formation pamphlets are available in the Office of the Registrar at UCSD.

**ABSENCE/READMISSION TO THE UNIVERSITY**

Students absent for no more than one quarter are considered to be continuing students and should contact the Office of the Registrar for registration information.

Undergraduates in good academic standing who are absent for two or more consecutive quarters must file an application for readmission no later than four weeks prior to the beginning of the quarter at the Office of the Registrar, Matthews Administrative and Academic Complex 301. A nonrefundable fee of \$40 is charged.

Undergraduate students in good academic standing who are absent for **two quarters** are automatically readmitted to UCSD.

Undergraduate students in good academic standing who were absent for **three quarters or more**, and who have been readmitted, must consult with a college academic adviser before enrollment. Students must adhere to the graduation requirements in effect at the time of readmission or those subsequently established.

Students who were on probation or subject to dismissal the last quarter of attendance at UCSD, but were not dismissed, must consult with an academic adviser and establish a contract before enrollment.

Students who were dismissed from UCSD, but have subsequently met the conditions stipulated in their original dismissal letter, must consult with an academic adviser and establish a quarterly contract before readmission and enrollment.

Students who attended another institution since leaving UCSD must submit official transcripts for all academic work completed. This work must be of passing or higher quality.

In the case of major departments with approved screening criteria, students may be readmitted as pre-majors.

**WITHDRAWAL FROM THE UNIVERSITY**

Registered students who wish to withdraw during the quarter are required to complete the Undergraduate Application for Withdrawal. Students who have completed the quarter and have enrolled in classes for the subsequent quarter, but have not yet paid fees for that

quarter, should complete the Request for Leave form. Both forms should be filed with their college academic advising or dean's office. These forms serve two purposes: 1) a refund of fees if appropriate (see below); 2) automatic withdrawal from classes (see also "The W Grade"). Students desiring to be absent are urged to consult with their provost's office. The provosts recognize the need for some students to "stop out" for a while. Each provost's office is prepared to deal, in a totally flexible manner, with any changes in the plans of the student or with any problems the student may have.

**REFUND POLICY**

**NEW UNDERGRADUATE STUDENTS**

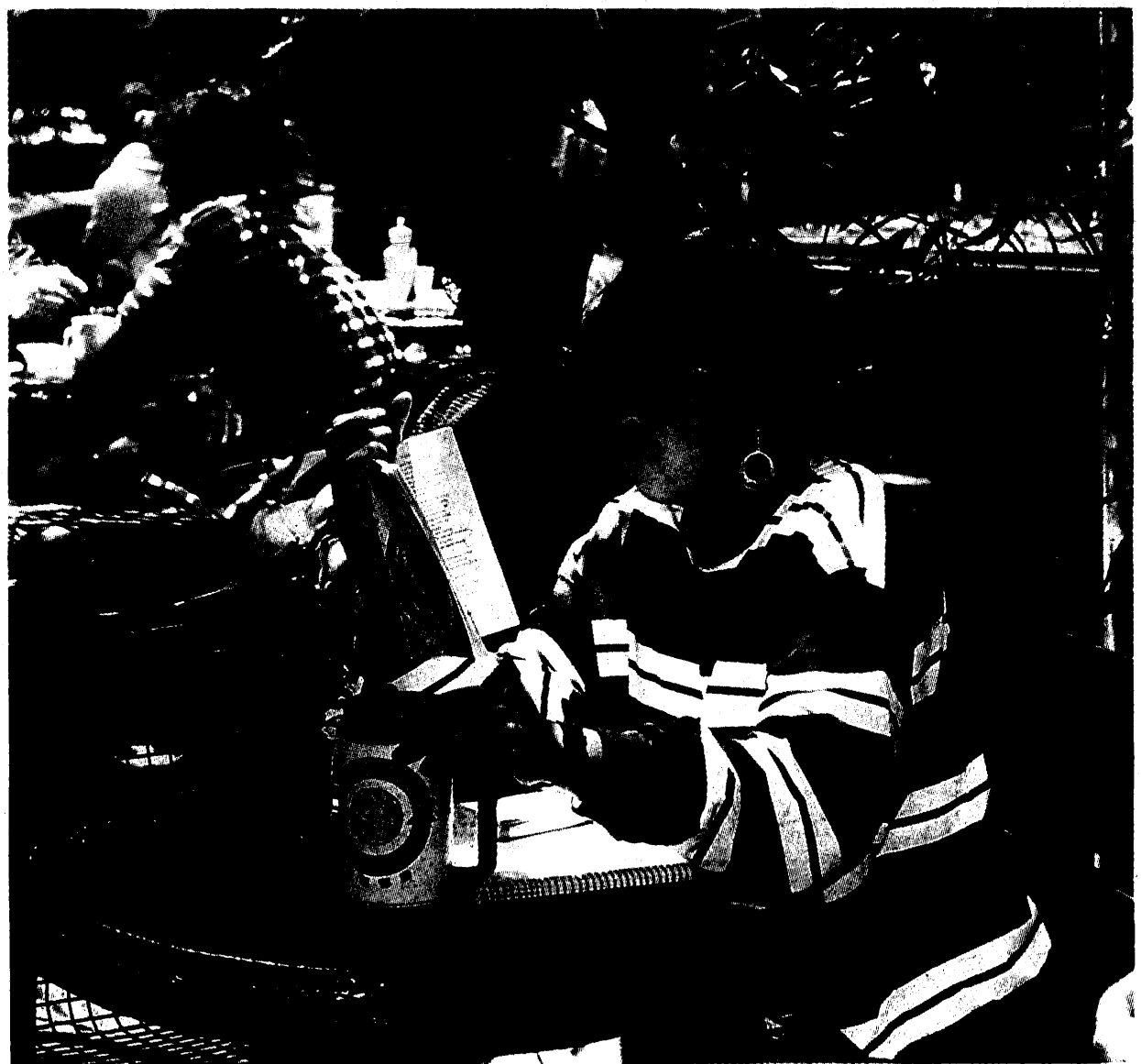
Prior to the first day of instruction, the registration fee is refunded minus the \$100 statement of intention to register fee.

**CONTINUING AND READMITTED STUDENTS**

There is a service charge of \$10 for cancellation of registration or withdrawal before the first day of instruction. The following schedule of refunds is effective beginning with the first day of instruction and refers to calendar days:

1-14 days	15-21 days	22-28 days	29-35 days	36 days and over
80 percent	60 percent	40 percent	20 percent	0 percent

The effective date of withdrawal used in determining the percentage of fees to be refunded is the date on which the student submits his or her withdrawal form to the Office of the Registrar.





## GRADUATE STUDIES

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At the University of California, San Diego all programs leading to master's degrees and the doctor of philosophy degree are under the jurisdiction of the Graduate Council and are administered by the Office of Graduate Studies and Research.

The merging of administrative responsibilities for graduate studies and for research reflects the intention of the San Diego campus to emphasize the research character of graduate education.

Graduate study involves more than the accumulation of credits. Although certain formal requirements exist, a plan of study cannot be

programmed in advance simply by listing courses to be taken and by indicating the time to be devoted to research. A Ph.D. degree is the culmination of creative effort; it attests to the ability of the recipient to continue original inquiry. In addition to requiring original research, the Office of Graduate Studies and Research strongly encourages all of its doctoral candidates to obtain teaching experience.

La Jolla has become one of the most important intellectual centers of the West. Not only has the university attracted many of the world's great scholars, but other research institutions such as the Salk Institute for Biolog-

ical Studies and the Scripps Clinic and Research Foundation have enhanced the area's reputation. From the beginning UCSD was determined to offer intellectual opportunities not elsewhere available. Much of the training it offers takes place outside the classroom—not only in seminars but in independent research and in tutorial work. In addition to the permanent faculty, there are many visitors from other universities; there are opportunities to study at other campuses of the University of California; and there is frequent association between members of the university and those individ-

uals who have come here to work within the research institutes at the UCSD campus.

## **THE NATURE OF GRADUATE INSTRUCTION**

Graduate courses demand, on the part of both instructor and student, a capacity for critical analysis and a degree of research interest beyond those appropriate for undergraduate study. These courses generally carry a number in the 200 series and may be conducted in any of several ways: (1) as advanced lecture courses; (2) as seminars in which faculty and students present critical studies of selected problems within the subject field; (3) as independent reading or study under faculty supervision; or (4) as research projects conducted under faculty supervision. Graduate courses numbered 400-499 are designed for professional programs leading to degrees other than the M.A., M.S., M.F.A., or Ph.D. These courses may not be used to satisfy minimum graduate course requirements for degrees other than the M.P.I.A. Courses at the upper-division level (100-197) may be offered in partial satisfaction of the requirements for an advanced degree.

Graduate students who take lower-division courses (1-99), may only take them on an S/U basis, except for students in the M.P.I.A. program who may take lower-division language courses for a letter grade.

The graduate student is accorded considerable liberty in choice of courses as long as minimum departmental core course, grading standards, and residence requirements are met.

## **ADMINISTRATION**

### ***THE OFFICE OF GRADUATE STUDIES AND RESEARCH***

The Office of Graduate Studies and Research is administered by a dean appointed by the president of the university on recommendation of the chancellor. The dean of Graduate Studies and Research is responsible for graduate admissions; graduate degree programs; the administration of fellowships, traineeships, and other graduate student support; the development of new programs; and the maintenance of common standards of high quality in graduate programs across the campus.

The dean reports to the vice chancellor of Academic Affairs and to the Graduate Council,

a standing committee of the Academic Senate, on the administration of graduate affairs.

### ***THE GRADUATE COUNCIL***

The Graduate Council is a standing committee of the San Diego Division of the Academic Senate composed of faculty and student representatives from graduate programs on the campus. The primary function of the council is to exercise overall responsibility for graduate study programs and to implement systemwide policies, procedures, requirements, and standards.

### ***THE GRADUATE ADVISER***

The graduate adviser in a department, group, or school is appointed by the dean of Graduate Studies and is the person to whom graduate students direct requests for information about graduate study in a particular program.

The graduate adviser's duties include:

1. Advising the dean on admission of graduate students.
2. Advising graduate students regarding their programs of study and other matters pertinent to graduate work.
3. Appointing individual advisers for each graduate student.
4. Approving official study lists.
5. Acting on the petitions of graduate students.
6. Insuring that adequate records are maintained on all graduate students in the department, group, or school, and supplying relevant information as requested by the dean.
7. Assisting the dean of Graduate Studies in the application of university regulations governing graduate students, graduate study, and graduate courses.
8. Advising the chair of the department and the dean of Graduate Studies in the planning and construction of the graduate program in the department, group, or school.

### ***GRADUATE STUDENT ASSOCIATION***

The Graduate Student Association (GSA) is the officially recognized graduate student representative body at UCSD. It represents all graduate and medical students—including those at Scripps Institution of Oceanography, the Graduate School of International Relations and Pacific Studies, and the School of Medi-

cine—in academic, administrative, campus, and statewide areas. The GSA, composed of a president, and two representatives from each department, group and school, nominates graduate student representatives for appointment to campus governing bodies and committees, including the Academic Senate, the Graduate Council, the Registration Fee Committee, and the systemwide Student Body Presidents' Council. The GSA also sponsors group, department, school, and campus-wide graduate student projects and social activities. Association meetings are open to all graduate students. A graduate student may apply to the GSA for assistance in resolving graduate student matters.

### ***GRADUATE STUDENT AFFIRMATIVE ACTION***

The University of California, San Diego actively recruits and admits students to graduate programs from those groups traditionally underrepresented as a result of economic, educational, or societal inequities.

The Graduate Student Affirmative Action Program provides an array of counseling and advocacy services to assist U.S. citizens and permanent residents from the underrepresented groups in applying, securing admission, receiving financial support, and successfully completing graduate degree programs.

Ethnic minority students, disabled students in graduate programs in all fields, and women students in engineering and the sciences, where they are traditionally underrepresented, are eligible for awards through the San Diego Fellowship Program. Fellows currently receive \$750 per month (a combination stipend and research assistantship) plus tuition and/or fees. Integral to the fellowship experience, fellows are assigned a faculty mentor in the major department to assist with academic and research goals.

The forms of financial support for subsequent years include teaching, research, and language assistantships.

For assistance and further information about special opportunities for ethnic minorities; for women in science, engineering, and mathematics; and for physically handicapped individuals, contact the graduate student affirmative action officer, Office of Graduate Studies and Research, 518 Matthews Administrative and Academic Complex, (619) 534-2770 or 534-3555.

**GRADUATE DEGREES OFFERED: 1992-93**

Anthropology	Ph.D.*	History	M.A., Ph.D.
Architecture	M.Arch.I** M.Arch.II** M.S.**	(Judaic Studies)	M.A.
Biology	Ph.D.	International Affairs	M.P.I.A.
Biology (Joint doctoral degree with San Diego State University)	Ph.D.	Pacific International Affairs	Ph.D.
Biomedical Sciences	Ph.D.*	International Affairs	M.I.T.M.P.**
Chemistry	Ph.D.*	International Technology Management and Policy	M.A.
Chemistry (Joint doctoral degree with San Diego State University)	Ph.D.	Latin American Studies	Ph.D.*
Clinical Psychology	Ph.D.	Linguistics	Ph.D.
(Joint doctoral degree with San Diego State University)		Literature	M.A.
Cognitive Science	Ph.D.*	Comparative	M.A.
Communication	Ph.D.*	English and American	M.A.
Comparative Studies in Language, Society, and Culture	Ph.D.§	French	M.A.
Computer Engineering	M.S., Ph.D.	German	M.A.
Computer Science	M.S., Ph.D.	Spanish	M.A.
Earth Sciences	Ph.D.*	Marine Biology	Ph.D.*
Economics	Ph.D.*	Materials Science	M.S., Ph.D.
Electrical Engineering		Mathematics	M.A., Ph.D.
(Applied Ocean Science)	M.S., Ph.D.	Mathematics (Applied)	M.A.
(Applied Physics)	M.S., Ph.D.	Statistics	M.S.
(Communication Theory and Systems)	M.S., Ph.D.	Molecular Pathology	Ph.D.
(Electronic Circuits and Systems)	M.S., Ph.D.	Music	M.A., Ph.D., D.M.A.**
(Intelligence Systems, Robotics and Control)	M.S., Ph.D.	Neurosciences	Ph.D.*
Engineering Sciences		Oceanography	Ph.D.*
(Aerospace Engineering)	M.S., Ph.D.	Philosophy	Ph.D.*
(Applied Mechanics)	M.S., Ph.D.	Physics	M.S., Ph.D.
(Applied Ocean Science)	M.S., Ph.D.	(Biophysics)	Ph.D.
(Bioengineering)	M.S., Ph.D.	Political Science	Ph.D.*
(Chemical Engineering)	M.S., Ph.D.	Psychology	Ph.D.*
(Engineering Physics)	M.S., Ph.D.	Public Health (Epidemiology)	
(Mechanical Engineering)	M.S., Ph.D.	(Joint doctoral degree with San Diego State University)	Ph.D.
(Structural Engineering)	M.S., Ph.D.	Sociology	Ph.D.*
Engineering Sciences (Applied Mechanics)		Teaching and Learning	
(Joint doctoral degree with San Diego State University)	Ph.D.	(Curriculum Design)	M.A.
		Theatre	M.F.A., Ph.D.**
		Visual Arts	M.F.A.

\*The master's degree may be awarded to students pursuing work toward the Ph.D. after fulfillment of the appropriate requirements. See appropriate section of catalog.

\*\*Approval pending.

§Students who have completed some graduate study at UCSD and have been admitted to a doctoral program may apply for this interdisciplinary program.



For information, see "Disabled Student Services."

### **CAREER SERVICES FOR GRADUATE STUDENTS**

The Career Services Center offers a wide range of programs and services to assist graduate students with their career planning and job search needs. Individual career counseling is available on both an appointment and drop-in basis. In addition, workshops and special events are regularly offered covering such areas as résumé writing, job search strategies, and nonacademic employment options. The Career Services Center also houses a career reference library containing information on employers, job listings, salaries, sample résumés, and publications pertinent to graduate students' career issues. For more information, see "Career Services."

### **GENERAL REQUIREMENTS FOR HIGHER DEGREES**

#### **COURSES AND GRADES**

Only upper-division and graduate courses in which a student is assigned grades A, B, C (including plus [ + ] or minus [ - ]), D, or S are counted in satisfaction of the requirements for the master of architecture, master of fine arts, master of Pacific international affairs, master of arts, master of science, and doctor of philosophy degrees. An Incomplete grade, as well as an NR, will automatically lapse to an F or U if it has not been removed when the final report for the degree is approved by the Office of Graduate Studies and Research. (See also "Grades.")

Courses in the 400 series may be used in the program for the M.P.I.A. or M. Arch. degrees offered by the Graduate School of International Relations and Pacific Studies and the

School of Architecture respectively. For course information see sections on "International Relations and Pacific Studies" and "Architecture" elsewhere in this catalog.

### **REGISTRATION IN THE FINAL QUARTER FOR THE AWARD OF THE DEGREE**

A student completing course work, using university facilities including the library, or making any demands upon faculty time (other than final reading of the thesis or dissertation, or administering the comprehensive or doctoral examination), must register in the final quarter in which the degree is to be conferred. Students who need only to submit their theses or dissertations, or to take the comprehensive or final examination may pay a filing fee in lieu of registration in the final quarter (see "Filing Fee").

### **THE MASTER OF ARTS AND MASTER OF SCIENCE DEGREES**

The master of arts and master of science degrees are offered under two plans: Plan I, Thesis Plan and Plan II, Comprehensive Examination. Since some departments offer both plans, with varying unit requirements, students should consult with their advisers before selecting a plan for completion of degree requirements.

### **PROGRAMS OF STUDY**

#### **PLAN I: THESIS PLAN**

At least thirty-six quarter-units are required: eighteen units in graduate courses, including a minimum of twelve units in graduate-level courses in the major field; twelve additional units in graduate or upper-division courses; and six units in research course work leading to the thesis.

Following advancement to candidacy, the student electing Plan I must submit a thesis. The thesis committee, appointed by the chair of the department or group and approved by the dean of Graduate Studies, consists of at least three faculty members.

Information covering thesis preparation is contained in the publication, *Instructions for the Preparation and Submission of Doctoral Dissertations and Masters' Theses*, which is mailed to students electing Plan I, upon their advancement to candidacy. The completed

thesis is submitted to the thesis committee for review.

When all members of the committee have approved the thesis, a Final Report of the Thesis for the Master of Arts or Master of Science Degree under Plan I must be completed. Approval by the dean of Graduate Studies and the subsequent acceptance of the thesis by the university archivist, Special Collections, represents the final step in the completion of all requirements by the candidate for a master of arts or master of science degree on the San Diego campus.

### **PLAN II: COMPREHENSIVE EXAMINATION PLAN**

At least thirty-six quarter-units are required: twenty-four units in graduate courses, including a minimum of fourteen units in graduate-level courses in the major field; and twelve additional units in graduate or upper-division courses.

### **APPRENTICE TEACHING**

A maximum of six units of 500-level courses (apprentice teaching) may be credited toward the degree requirements.

### **ACADEMIC RESIDENCE**

The minimum residence requirement is three academic quarters, at least one of which must follow advancement to candidacy. Academic residence is met by satisfactory completion of six units or more per quarter, some of which must be graduate level.

A candidate must be registered in the quarter in which the degree is to be awarded. (See "Registration in the Final Quarter for the Award of the Degree.")

### **ADVANCEMENT TO CANDIDACY**

After completing all preliminary requirements of the major with a GPA equivalent to 3.0 in upper-division and graduate course work undertaken, with a total of no more than eight units of F and/or U grades, and a minimum of two quarters or more of residency, the student may file an Application for Candidacy for the Thesis or Comprehensive, Plan I or II, for the Master of Arts or Master of Science Degree. An application for candidacy must be filed no later than two weeks after the first day of the quarter in which degree requirements

are to be completed. (See "Academic Calendar.")

Following advancement to candidacy, the student electing Plan II must pass a comprehensive examination administered by the major department. A Final Report of the Comprehensive Examination for the Master of Arts or Master of Science Degree under Plan II is used to report successful completion of the examination requirement.

### **TRANSFERRING CREDIT**

With the approval of the department concerned and the dean of Graduate Studies, upper-division and graduate course work completed with a grade of B— or better while in graduate standing at another campus of the University of California may be accepted in satisfaction of one of the three quarters of residence and up to one-half of the quarter-units of credit required for the master's degree at UCSD.

On the recommendation of the major department and with the approval of the dean of Graduate Studies, a maximum of eight quarter-units of credit for work completed with a grade of B— or better in graduate standing at an in-

stitution other than the University of California may be applied toward a master's degree at UCSD.

In any case, no more than a total of one-half of the units required for a master's degree may be transferred in from any source.

Course work approved for transfer credit will not be included in calculating a student's grade-point average.

### **THE MASTER OF FINE ARTS DEGREE**

The master of fine arts degree is offered under a modified thesis plan. A short written thesis that may be regarded as a position paper, presenting a descriptive background for the student's work, is required. There is no final examination, but great weight is given to the candidate's final presentation and the oral defense of the thesis.

### **PROGRAM OF STUDY**

#### **PLAN III: MODIFIED THESIS PROGRAM**

Seventy-two quarter-units for visual arts and ninety quarter-units for theatre, with a GPA equivalent to 3.0 in upper-division and graduate course work undertaken, are required for a master of fine arts degree. Information covering thesis preparation is contained in the publication, *Instructions for the Preparation and Submission of Doctoral Dissertations and Masters' Theses*, which is mailed to students upon their advancement to candidacy. The completed thesis is submitted to the thesis committee for review.

Following the filing of an Application for Candidacy for the Modified Thesis, Plan III, the candidate must submit a thesis. The thesis committee, appointed by the chair of the department and approved by the dean of Graduate Studies, consists of three faculty members (two from the department and at least one, preferably tenured, from a different department).

When all members of the committee have approved the thesis, a Final Report of the Modified Thesis Examination, Plan III, for the Master of Fine Arts Degree must be completed. Approval by the dean of Graduate Studies and subsequent acceptance of the thesis by the university archivist, Special Collections, represents the final step in the com-





## GRADUATE STUDIES

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pletion of all requirements by the candidate for a master of fine arts degree on the San Diego campus.

### **ACADEMIC RESIDENCE**

The minimum residence requirement is six academic quarters for visual arts and eight academic quarters for theatre, at least one of which must follow advancement to candidacy in either program. Academic residence is met by satisfactory completion of six units or more per quarter, some of which must be graduate level. The entire residence requirement must be satisfied at UCSD.

A candidate must be registered in the quarter in which the degree is to be awarded. (See "Registration in the Final Quarter.")

### **ADVANCEMENT TO CANDIDACY**

After completing all preliminary requirements of the department with a GPA equivalent to 3.0 in upper-division and graduate course work undertaken, with a total of no more than eight units of F and/or U grades, and a minimum of five quarters of residency, the student may file an Application for Candidacy for the Modified Thesis, Plan III, for the Master of Fine Arts Degree. An application for candidacy must be filed no later than two weeks after the first day of the quarter in which degree requirements are to be completed. (See "Academic Calendar.")

### **GRADUATE WORK COMPLETED ELSEWHERE**

In exceptional circumstances, a student may be given a leave of absence for the purpose of studying elsewhere. While appropriate credit may be allowed for course work completed elsewhere with a grade of B or better in a graduate program, the period involved will not reduce the UCSD academic residence requirement of six academic quarters for visual arts and eight quarters for theatre.

### **THE MASTER OF PACIFIC INTERNATIONAL AFFAIRS**

The master of Pacific international affairs program provides training for those interested in pursuing professional careers in international affairs and international management with an emphasis on the countries of the Pacific Rim. For degree requirements and curric-

ulum, please refer to the Graduate School of International Relations and Pacific Studies description under the catalog listings of programs of instruction.

### **THE DOCTOR OF PHILOSOPHY DEGREE**

The doctor of philosophy degree is a research oriented degree which requires individual study and specialization within a field or the establishment of connections among fields. It is not awarded solely for the fulfillment of technical requirements such as academic residence and course work. Candidates are recommended for the doctorate in recognition of having mastered in depth the subject matter of their discipline and having demonstrated the ability to make original contributions to knowledge in their field of study. More generally, the degree constitutes an affidavit of critical aptitude in scholarship, imaginative enterprise in research, and proficiency in communication, including—in most departments—practice in teaching.

### **PROGRAM OF STUDY**

The student's program of study is determined in consultation with the adviser who

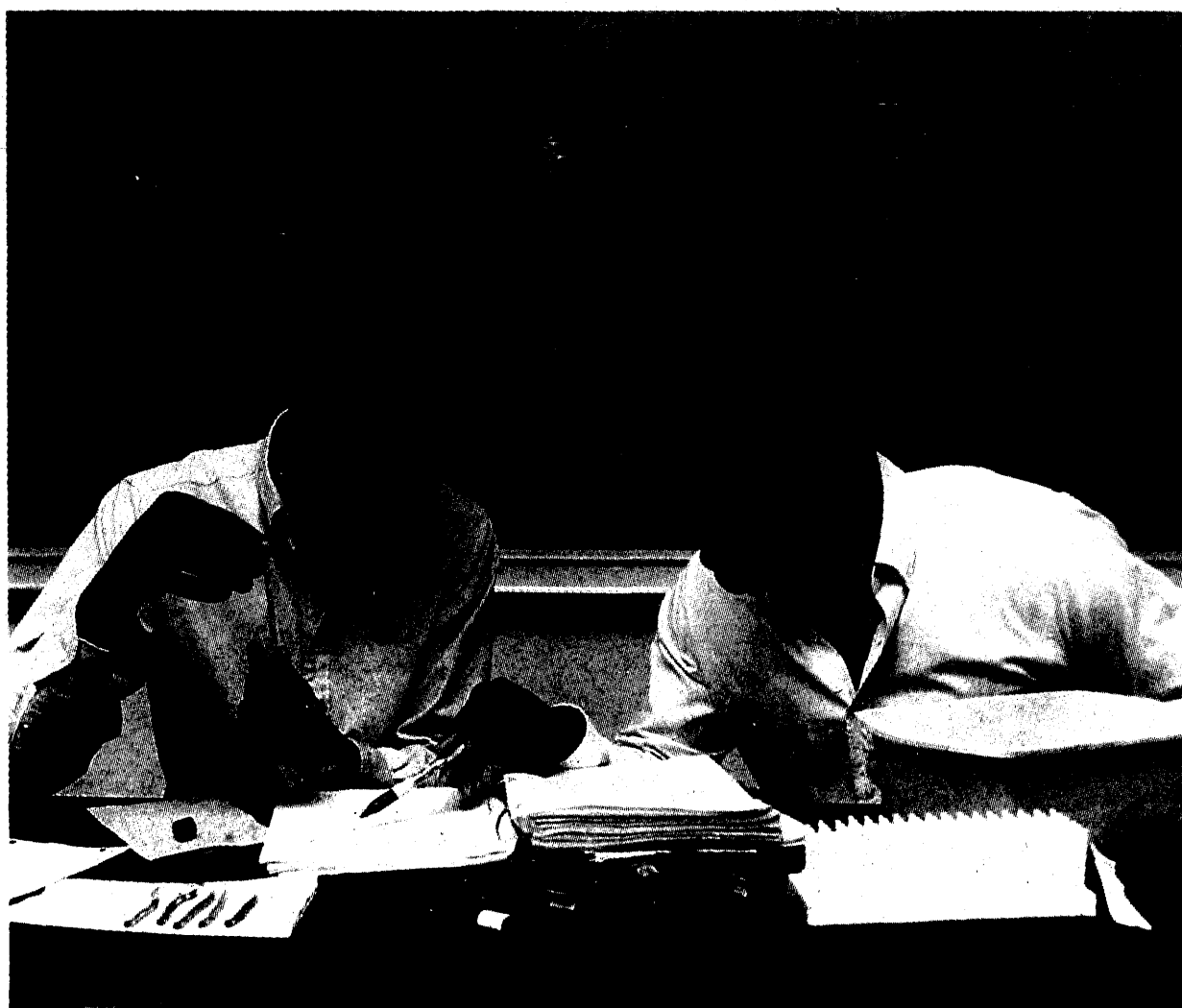
supervises the student's activities until the appointment of the doctoral committee. A doctoral program generally involves two stages.

The first stage requires at least three quarters of academic residence and is spent in fulfilling the requirements established by the Academic Senate and by the major department, group, or school. When the department considers the student ready to take the qualifying examination, it arranges for the appointment of a doctoral committee. Immediately upon passing the qualifying examination administered by the doctoral committee, the student advances to candidacy.

The second or in-candidacy stage is devoted primarily to independent study and research and to the preparation of the dissertation. A minimum interval of three quarters of academic residence should elapse between advancement to candidacy and the filing and final defense of the dissertation.

### **FOREIGN LANGUAGE REQUIREMENTS**

Some doctoral programs require candidates to demonstrate language proficiency in one or more languages, as part of the formal requirements for the Ph.D. degree. In these



cases, the testing of proficiency is the responsibility of the department, group, or school concerned.

### **PH.D. TIME LIMITS**

All graduate students in doctoral programs are subject to campus policy on time limits to the Ph.D. Each graduate program has four time limits pertaining to students' academic progress toward the Ph.D. degree.

The foundation of the policy is normative time. Normative time is a standard established for the time period in which students, under normal circumstances, are expected to complete requirements for the Ph.D. degree in a particular discipline. Students, in consultation with their faculty advisers, are expected to plan their programs of study for completion within the normative time period for their discipline. The normative times for Ph.D. programs at UCSD are listed on the following page.

In addition to normative time, each Ph.D. program has three maximum time limits: (1) maximum registered time in which a student must advance to Ph.D. candidacy; (2) maximum registered time during which a doctoral student is eligible for support; and (3) maximum registered time in which a student must complete all Ph.D. requirements. Students will not be permitted to continue in doctoral status after the expiration of the pre-candidacy and total registered time limits. Students will not be permitted to receive UCSD-administered financial support after the expiration of the support limits. Information about these time limits is given in the descriptions of each department's graduate program in the *UCSD General Catalog* and departmental publications.

University policy requires that graduate students be continuously registered—unless on an approved leave of absence—from the first quarter of enrollment to completion of degree requirements. (See "Continuous Registration" and "Leave of Absence.")

In-candidacy educational fee grants are provided to students in the normative time program after advancement to Ph.D. candidacy and until the accrued time in graduate status exceeds the normative time. (See "Reduced Fee Enrollments.")

For purposes of calculating normative time and the maximum time during which a student is eligible to receive support, the normative

time and time limits policies define accrued time as elapsed time from first enrollment as a graduate student at UCSD, less (a) up to three quarters while on a formal leave of absence or withdrawn; and (b) time between completion of or withdrawal from one graduate program at UCSD and first registration in a different field of study. Time spent in graduate study at another institution or University of California campus prior to beginning graduate study at UCSD will not count toward accrued time, with the exception of students entering the Ph.D. program in electrical engineering, computer science, or music who have earned a master's degree in that discipline. All of the following will count toward accrued time: time spent at UCSD as a master's, non-degree, or inter-campus exchange graduate student; time spent on leave beyond three quarters; time spent between completion of or withdrawal from a graduate program at UCSD and re-registration in the same field of study. Pre-candidacy and total registered time limits will not accrue during periods of leave of absence and/or withdrawal in excess of three quarters.

Policy changes in the normative time program and on the time-to-degree policy were implemented in 1989-90. Further information may be obtained from the Office of Graduate Studies and Research.

### **ACADEMIC RESIDENCE**

The minimum residence requirement for the doctor of philosophy degree is six quarters, three of which must be in continuous academic residence at UCSD. Residency is established by the satisfactory completion of six units or more per quarter, at least some of which must be at the graduate level.

A candidate must be registered in the final quarter in which the degree is to be awarded. (See "Registration in the Final Quarter.")

### **THE DOCTORAL COMMITTEE**

At least two weeks prior to a scheduled qualifying examination, the department arranges for the appointment of the doctoral committee. This committee conducts the qualifying examination, supervises the preparation of and passes upon the dissertation, and administers the final examination.

The committee consists of five or more officers of instruction, no fewer than four of whom shall hold professorial titles of any rank. The

committee members shall be chosen from two or more departments; at least two members shall represent academic specialties that differ from the student's major department, group, or school, and one of these two must be a tenured UCSD faculty member.

### **RECONSTITUTED DOCTORAL COMMITTEE**

For a variety of reasons a doctoral committee may have to be reconstituted. The request for reconstitution of the membership of a doctoral committee, including departmental affiliation of the members of the proposed committee, together with the reasons for requesting the change must be submitted in writing to the dean of Graduate Studies by the chair of the candidate's major department, group, or school no less than two weeks prior to the qualifying examination or defense of the dissertation.

### **QUALIFYING EXAMINATION AND ADVANCEMENT TO CANDIDACY**

The doctoral committee administers the qualifying examination and authorizes the issuance of the Report of the Qualifying Examination and Advancement to Candidacy for the Degree of Doctor of Philosophy. Formal advancement to candidacy requires the student to pay a candidacy fee to the cashier prior to submitting the form to the dean of Graduate Studies for approval. Students must maintain a GPA equivalent to 3.0 or better in upper-division and graduate course work undertaken with a total of no more than eight units of F and/or U grades in order to take the qualifying examination and advance to candidacy.

If the committee does not issue a unanimous report on the examination, the dean of Graduate Studies shall be called upon to review and present the case for resolution to the Graduate Council, which shall determine appropriate action.

### **DISSERTATION AND FINAL EXAMINATION**

A draft of the doctoral dissertation should be submitted to each member of the doctoral committee at least four weeks before the final examination. The form of the final draft must conform to procedures outlined in the publica-

**NORMATIVE TIMES FOR DOCTORAL PROGRAMS**

<u>Department/Group/School/Program</u>	<u>Normative Time</u>	<u>Department/Group/School/Program</u>	<u>Normative Time</u>
	<b>Years</b>		<b>Years</b>
Anthropology	6	Molecular Pathology	5
Applied Mechanics and Engineering Sciences		Molecular Pathology Ph.D.-M.D. program	7
(Aerospace Engineering)	5	History	6
(Applied Mechanics)	5	International Affairs	5
(Applied Ocean Science)	5	Linguistics	6
(Bioengineering)	5	Literature	6
(Bioengineering) Ph.D.-M.D. program	7	Materials Science	5
(Chemical Engineering)	5	Mathematics	5
(Engineering Physics)	6	Music	
(Mechanical Engineering)	5	With master's from another university	4
(Structural Engineering)	5	Without master's from another university	6
Biology	5	Neurosciences	5
Biology Ph.D.-M.D. program	7	Neurosciences Ph.D.-M.D. program	7
Biomedical Sciences	6	Philosophy	6
Biomedical Sciences Ph.D.-M.D. program	8	Physics	
Chemistry	5 1/3	Theoretical Physics	5
Chemistry Ph.D.-M.D. program	7	Experimental Physics	6
Clinical Psychology	5	Physics	
Cognitive Science	6	(Biophysics)	6
Communication	6	Political Science	
Comparative Studies in Language, Society and Culture	6	Without field study	5
Computer Science		With field study	6
With master's from another university	4	Psychology	5
Without master's from another university	5	Psychology Ph.D.-M.D. program	7
Economics	5	Scripps Institution of Oceanography	
Electrical Engineering		Oceanography	6
(Applied Ocean Science)		Earth Sciences	6
(Applied Physics)		Marine Biology	6
(Communication Theory and Systems)		Sociology	6
(Computer Engineering)			
(Intelligence Systems, Robotics and Control)			
With master's from another university	5		
Without master's from another university	6		

tion, *Instructions for the Preparation and Submission of Doctoral Dissertations and Masters' Theses*, which is mailed to candidates upon their advancement to candidacy.

The doctoral committee shall supervise and pass on the candidate's dissertation and conduct the final oral examination which shall be public and so announced.

If the committee does not issue a unanimous report on the examination, the dean of Graduate Studies shall be called upon to review and present the case for resolution to the Graduate Council, which shall determine appropriate action.

The Report of the Final Examination and Filing of the Dissertation for the Degree of Doctor of Philosophy form is initiated by the department, group, or school, signed by members of the doctoral committee, and the chair of the (major) department, group, or school.

The candidate submits the dissertation to the Office of Graduate Studies and Research and, upon approval by the dean of Graduate Studies, files the dissertation with the university archivist, who accepts it on behalf of the Graduate Council. Acceptance of the dissertation by the archivist, with a subsequent second approval by the dean of Graduate Studies, represents the final step in the completion by the candidate of all requirements for the doctor of philosophy degree.

### **CANDIDATE IN PHILOSOPHY DEGREE**

In several departments, as approved by the Graduate Council, the intermediate degree of candidate in philosophy (C.Phil.) is awarded to students upon advancement to candidacy for the Ph.D. degree. The minimum residence requirement for this degree is four quarters, at least three of which must be spent in continuous academic residence at UCSD. The C.Phil. degree cannot be conferred before the master's degree, or simultaneously with or following the award of a Ph.D. degree.

### **CERTIFICATE OF COMPLETION**

Upon request, the Office of Graduate Studies and Research will direct the Office of the Registrar to issue a Certificate of Completion to a graduate student who has completed all requirements for a higher degree but whose diploma has not yet been issued.

### **CERTIFICATE OF RESIDENT STUDY/FOREIGN STUDENTS**

In addition to a formal transcript, the Office of the Registrar will issue a Certificate of Resident Study to any foreign student whose visa status requires a return home before completion of studies in the United States. The student must have completed at least three quarters of full-time resident study not covered by a diploma or other certificate with a grade-point average of at least 2.5, and satisfactorily conducted a research program of at least nine calendar months' duration.

### **POSTGRADUATE APPOINTMENTS**

A UCSD graduate student is not eligible for any UCSD postdoctoral appointment until all requirements for the Ph.D. degree have been completed. Such appointments may begin after the university archivist has accepted the dissertation and final signatures have been obtained on the final report.

### **SPECIAL DEGREE PROGRAMS**

#### **GRADUATE PROGRAMS IN THE HEALTH SCIENCES**

The university offers research training programs in the health sciences leading to the doctor of philosophy degree. The purpose of these graduate programs is to prepare students for careers in research and teaching in the basic medical sciences. Program requirements are flexible, consisting of graduate courses and supervised laboratory or clinical investigation. Graduate programs in the health sciences are offered by (1) regular campus-wide departments with activities related to the health sciences, for example, the Departments of Applied Mechanics and Engineering Sciences, Biology, Chemistry, and Psychology and (2) interdisciplinary groups of faculty drawn from the School of Medicine and from campus-wide departments or from San Diego State University.

The following departments or interdisciplinary graduate groups provide research training opportunities in the biomedical sciences and should be contacted directly for further information: biomedical sciences, bioengineering, biochemistry (in either biology or chemistry), biology, biophysics, clinical psychology, molecular pathology, neurosciences, physics,

physiology and pharmacology, psychology, public health (epidemiology), and Scripps Institution of Oceanography.

### **PH.D.-M.D. PROGRAM**

Students may meet the requirements for both the Ph.D. and M.D. degrees in programs offered jointly by the School of Medicine and the graduate programs in the health sciences. In most cases, students are first admitted to the School of Medicine and may then apply for admission to a relevant graduate program. However, those students who wish to be considered for admission to the Medical Scientist Training Program (MSTP) may apply for admission to the School of Medicine and the MSTP concurrently.

Elements of the first two years of the medical school curriculum satisfy many of the requirements of the graduate program, but additional courses will be required. Thus, the student must complete requirements for the Ph.D. in accordance with the regulations of a department or a group and must in addition meet the requirements for the professional degree. Students interested in such programs should consult the associate dean for Student Affairs, School of Medicine.

### **JOINT DOCTORAL PROGRAMS**

Certain departments of the University of California cooperate with similar departments on the several campuses in the California State University System to offer joint programs of study leading to the Ph.D. degree. At UCSD, joint doctoral programs in biology, chemistry, clinical psychology, engineering sciences (applied mechanics), and public health (epidemiology) are currently offered in conjunction with San Diego State University. Applicants interested in these joint programs should consult the Departments of Biology, Chemistry, Mechanical Engineering, Psychology, or the Office of the Dean, College of Engineering, or School of Public Health, at San Diego State University.

### **SPECIAL PROGRAMS**

#### **INTERCAMPUS EXCHANGE PROGRAM FOR GRADUATE STUDENTS**

An advanced graduate student registered on any campus of the University of California,

who wishes to take advantage of educational opportunities for study and research available on another campus of the university, may become an intercampus exchange student on that UC campus.

Informal arrangements between departmental faculty on the two campuses should be undertaken prior to submission of a student's application to assure that space in desired courses, seminars, or facilities will be available.

No later than four weeks prior to the opening of the term on the host campus, a student must complete the Application for Intercampus Exchange Program for Graduate Students obtainable at the Office of Graduate Studies and Research. This application, signed by the student's adviser and the graduate dean of the home campus, is forwarded for signature by the department and the graduate dean on the host campus.

Registration is accomplished by the student registering and paying all required fees at the home campus, and then presenting a validated student photo-identification card to the Office of the Registrar on the host campus. In turn, the registrar will issue a Student Identification Card for the host campus.

An exchange student is not admitted to graduate standing at the host campus but is considered a graduate student in residence at the home campus. Grades obtained in courses taken by the student enrolled in the intercampus graduate student exchange program are transferred to the home campus for entry on the student's official record. Library, infirmary, and other student privileges are extended by the host campus.

### **OFF-CAMPUS STUDY**

#### **(Other than Intercampus Exchange Program)**

The research and study programs of graduate students may require them to be off campus for extended periods of five weeks or more. During such periods a student is required to remain a registered student at UCSD and to carry twelve units of course work or research.

If the off-campus study is outside the state of California, one-half of the registration fee may be waived. The full educational fee, student center fee, recreation facility fee, health insurance fee, and nonresident fee, if applicable, must be paid.



A graduate student who holds a fellowship, traineeship, or a research assistantship and desires to study off campus may do so under the following circumstances: The student must have completed at least one year of graduate study at UCSD, obtained the approvals of the major department and the dean of Graduate Studies, and agreed to comply with the rules and regulations governing the award or appointment.

Regulations concerning accepting additional awards or compensation for employment as outlined under the financial assistance section apply to off-campus study as well as on-campus study.

### **UCSD EXTENSION**

Through a reciprocal agreement with UCSD Extension, a limited number of spaces in extension classes are open to full-time graduate students (registered for twelve units or more) without payment of additional fees. The number of spaces available for each quarter varies. The student must obtain a UCSD Application for Enrollment from the Office of Graduate Studies and Research and personally secure the necessary approvals.

Students wishing to offer UCSD Extension course work in partial satisfaction of requirements for a master's degree must file a General

Petition with the Office of Graduate Studies and Research. Acceptance of such course work is subject to the recommendation of the major department and approval of the dean of Graduate Studies, and may not be considered in advance of registration and satisfactory completion of course work in a regular session.

### **EDUCATION ABROAD PROGRAM**

This statewide program is coordinated on the San Diego campus by the Opportunities Abroad Office. Study abroad is presently available on campuses in Australia, Austria, Brazil, Canada, Costa Rica, Denmark, Egypt, France, Germany, Ghana, Hong Kong, Hungary, India, Indonesia, Ireland, Israel, Italy, Japan, Kenya, Korea, Mexico, New Zealand, Norway, People's Republic of China, Peru, Portugal, Spain, Sweden, Taiwan, Thailand, Togo, the United Kingdom, and U.S.S.R.

A graduate student is eligible for the Education Abroad Program after completion, with a B average or better, of one full academic year at a UC campus with departmental approval. Students must submit an application to the appropriate office on their home campus accompanied by required supporting documentation. Undergraduates will be given first prefer-



ence when applications exceed guaranteed spaces.

Selection procedures involve an interview with members of the Education Abroad Program Selection Committee on the student's home campus and a final acceptance by the host university.

Costs vary according to location. Teaching assistantships are available occasionally at some of the overseas campuses.

Students must register, pay fees, and enroll at their home campus as well as enroll at the host university; and they must obtain clearance from their home campus student health service. Full academic credit is received for courses satisfactorily completed.

At UCSD, complete information and application forms for the various overseas campuses may be obtained from the Opportunities Abroad Office, International Center, Matthews Administrative and Academic Complex, 0018. In addition, the Opportunities Abroad Office also offers information and advisory services to graduate and undergraduate students interested in pursuing other activities involving study, research, work, or travel abroad.

See also Education Abroad Program in chapter entitled "Courses, Curricula, and Programs of Instruction."

### POSTDOCTORAL STUDY

Postdoctoral scholars, trainees, and fellows play a major role in UCSD's teaching and research programs. All interested candidates should make advance arrangements with the relevant department or research unit. The Office of Graduate Studies and Research has administrative responsibility for the enrollment and census of postdoctoral scholars undertaking training at UCSD. A scholar is enrolled by means of a Postdoctoral Study and Training Enrollment form initiated in the office of the faculty sponsor and forwarded to the Office of Graduate Studies and Research for approval and is eligible for a UCSD academic photo identification card. When a scholar has completed a period of postdoctoral study, the department at UCSD may request a Certificate of Postdoctoral Study from the Office of Graduate Studies and Research. This certificate will indicate the area of study and the dates enrolled.

Health Net, a prepaid health plan, DentiCare, a prepaid dental plan, and voluntary term life insurance are available for purchase by UCSD postdoctoral scholars. All scholars are required to enroll in Health Net unless they

have adequate coverage through another health insurance program. Information on Health Net, DentiCare, life insurance, and enrollment procedures may be obtained from administrative offices of departments, groups, schools, or organized research units.

### FEES

For the 1991-92 academic year, the following schedule of fees applied. Based on past experience, fees for the 1992-93 academic year are expected to increase considerably.

#### FEES PER QUARTER\*

	Resident	Non-Resident
Tuition	\$	\$2,566.00
Registration	231.00	231.00
Educational	527.00	527.00
Student Center	37.50	37.50
Recreation		
Facility	12.00	12.00
Graduate Student		
Assoc.	5.00	5.00
Health Insurance	133.00	133.00
Totals	\$ 945.50**	\$3,511.50**

#### Miscellaneous Fees and Fines

Students should also be aware of the following charges:

Application fee for admission	\$40
Duplicate Photo-ID card	10
Petition for Readmission	40
Removal of Grade "I"	5
Advancement to Candidacy for Ph.D.	25
Transcript of Record	3
Late payment of fees (Late registration)	50
Late filing of enrollment cards (including Preferred-Program Request)	50
Returned check collection	10
Filing fee	115.50

**\*Subject to change without notice.** All receipts for payments made to the cashier, whatever their nature, should be carefully preserved. Not only do they constitute evidence that financial obligations have been discharged, but they may be required to support a claim that certain documents or petitions have been filed.

\*\*Fees for graduate students approved for enrollment in a half-time program (not to exceed six units) total \$682.00 for resident students and \$1,965.50 for nonresident students.

### CALIFORNIA RESIDENCY AND THE NONRESIDENT TUITION FEE

Each new student entering UCSD is required to submit a Statement of Legal Residence to the Office of the Registrar. No tuition is charged to students classified as residents

of California. Nonresidents, however, are required to pay a quarterly tuition fee.

A complete statement covering California residence requirements, determination of residence for tuition purposes, and/or recognized exceptions appears in the section "Residence Requirements." Additional information may be obtained from the Campus Residence Deputy, Office of the Registrar, Building 301, Matthews Administrative and Academic Complex. No other university personnel are authorized to supply information relative to residence requirements for tuition purposes.

To the extent funds are available, subject to change, waiver of nonresident tuition may be granted to spouses and dependent, unmarried children under age twenty-one of university faculty members who are qualified for membership in the Academic Senate. Inquiries should be directed to the dean of Graduate Studies and Research.

### UNIVERSITY REGISTRATION FEE

The university registration fee is a quarterly fee required of all registered students, and it



must be paid at the time of the student's registration. This fee is for services which benefit the student and are complementary to, but not part of, the regular instructional programs of the university. No part of this fee is refunded to students who do not make use of these services. Exemption from this fee may be granted to surviving children of certain deceased California fire fighters or police officers. Students who believe they may qualify for an exemption on this basis must consult with the Student Financial Services Office, Building 213, Matthews Administrative and Academic Complex, for a ruling.

### **STUDENT HEALTH SERVICES AND INSURANCE PLANS**

The Student Health Center provides primary care without charge during the academic year for all students who pay the university registration fee. These services are also available during summer for a modest fee.

Students who pay fees are automatically enrolled in the Student Limited Insurance Plan (SLIP). SLIP is provided without charge to all eligible students to help defray some of the expenses of outpatient care and is intended to supplement GSHIP.

The Graduate Student Health Insurance Plan (GSHIP) is a comprehensive group health plan and is mandatory for all graduate and professional students. GSHIP provides coverage year-round to include summer and holiday periods. To be covered under GSHIP over summer, a student must be enrolled in the plan for the preceding spring quarter. Students who provide proof of health insurance benefits equal to or better than those of GSHIP may be granted a waiver. Waiver requests must be made in writing to the director of the Student Health Center, 0039. Dependent coverage is also available through GSHIP.

Premium payment for GSHIP is due with the payment of the registration fee. Premiums for students holding graduate academic employee titles for a full academic term at 25 percent time or greater will be paid directly by the university. Premiums for most students holding fellowships and training grants are also paid directly. Loans to cover premiums may be available for students who receive need-based financial assistance. Dependents must enroll in GSHIP through the Student Health Services Office.

### **EDUCATIONAL FEE**

The educational fee was established as a required fee for all students beginning with the fall quarter 1970. It is used to cover a variety of educational costs as determined by the regents. The educational fee may be reduced by one-half for students enrolled in six units or fewer (see "Part-time Study").

### **STUDENT CENTER FEE**

Every student is required to pay a student center fee each quarter.

### **RECREATION FACILITY FEE**

Every student is required to pay a recreation facility fee each quarter.

### **REDUCED FEE ENROLLMENTS**

1. The In-Candidacy Educational Fee Grant under the normative time program provides an educational fee grant each quarter, currently \$527.00, for students who have advanced to candidacy for the Ph.D. degree. When the individual's accrued time in a program exceeds the normative time established for that degree by the major department, group, or school, the candidate will resume paying full fees. (See "Normative Time Program" bulletin for complete information.)

2. One-half of the established registration fee may be waived for graduate students whose research or study requires them to remain outside the state of California throughout the quarter. Students must file a General Petition for this privilege. The reduction pertains to one-half of the registration fee only. A student must pay, in addition, the educational fee, student center fee, recreation facility fee, health insurance fee, and nonresident tuition fee, if applicable.

3. Graduate students approved for enrollment in a half-time program (not to exceed six units) are eligible for a reduction in fees of one-half the educational fee, and, if applicable, one-half of the nonresident tuition fee.

4. A full-time employee who is not subject to nonresident tuition, who has worked full time for the university for at least six months prior to the latest date that registration will be accepted, and who meets the admission requirements of the university is eligible for two-thirds reduction of both the university registration fee and the university educational fee for

up to nine units or three regular session university courses per quarter, whichever is greater. An employee so registered is ineligible for the services and facilities of the Counseling Center, gymnasiums, or the Student Health Services, other than those services to which the employee is regularly entitled (University of California Staff Personnel Policy 260.23). Authorization for this privilege is secured from the Staff Personnel Office for staff employees, or from the Academic Personnel Office for individuals on academic appointments.

NOTE: In accordance with Academic Senate regulations, no voting member of the San Diego Division of the Academic Senate should be recommended for a higher degree from UCSD unless the dean of Graduate Studies shall have certified that all requirements for that degree have been met prior to the appointment to a rank carrying the voting privilege.

### **FILING FEE**

A student on an approved leave of absence who has completed all requirements except for the final reading of the dissertation or thesis or the taking of the final examination is eligible to petition to pay a filing fee in lieu of registering and paying all required fees in the final quarter. The filing fee applies to both residents and nonresidents. Students must apply for this privilege by means of a General Petition.

### **REFUND OF FEES**

Students who withdraw from the university during the first five weeks of instruction may receive partial refunds of fees and nonresident tuition, if applicable. The date of withdrawal, as related to the fee refund schedule, shall be the date on which notice of withdrawal is submitted to the Office of the Registrar. See *Schedule of Classes* for schedule of refunds.

### **PARKING FEE**

Students who park motor vehicles, including motorcycles, on the campus are subject to parking fees. (See "Parking," in chapter entitled "Campus Services and Facilities.")

### **PENALTY FEES**

Penalty fees (see "Fees,") are charged for failure to comply with normal deadline dates. To avoid such fines, students should fulfill all

requirements in advance of the deadlines listed in the Academic Calendar.

### **TRANSCRIPT FEES**

Students may obtain transcripts of their UCSD records from the Office of the Registrar for \$3 for each copy. Transcripts must be requested several days in advance of date needed.

### **FINANCIAL ASSISTANCE**

Several kinds of financial assistance are available to graduate students at UCSD. These include fellowships and traineeships; assistantships in teaching, language instruction, and research; scholarships in full or partial payment of tuition and/or fees; and loans and grants-in-aid. Further details about these awards may be obtained from departmental, group, or school offices.

Descriptions in this section deal entirely with awards administered directly by the university. The terms *appointment* or *award* mean employment for compensation, award of a fellowship or scholarship, or any other formally recognized educational benefit.

Applicants for financial assistance should note the following: "Pursuant to Section 7 of the Privacy Act of 1974, applicants for student financial aid or benefits are hereby notified that mandatory disclosure of their Social Security number is required by the University of California to verify the identity of each applicant. Social Security numbers are used in processing the data given in the financial aid application; in the awarding of funds; in the coordination of information with applications for federal, state, university, and private awards or benefits; and in the collection of funds and tracing of individuals who have borrowed funds from federal, state, university, or private loan programs."

### **FELLOWSHIPS AND TRAINEESHIPS**

The San Diego Fellowship, limited to minority students and women students in underrepresented fields such as physics and mathematics, currently provides a stipend of \$375 per month and a partial research assistantship of approximately \$375 per month plus tax-free resident fees and nonresident tuition, if applicable.

Seven additional fellowships for the top incoming minority students and women students

in underrepresented fields are available from monies provided by the Office of the President. These awards provide an annual stipend of \$12,500, resident fees and nonresident tuition, if applicable. The fellowship is given for a period of four years, and the student is eligible for additional funding in the dissertation year.

Regents Fellowships, offered to students with excellent academic and research qualifications, provide a stipend of \$10,000 for nine or ten months, plus tax-free resident fees and nonresident tuition, if applicable. These awards may be supplemented with a partial research assistantship or research fellowship from available departmental resources. The amount of the supplement varies by department.

All other fellowship stipends are established by the departments, group, or school and may vary in tenure from one to twelve months and in amount from \$100 to \$1,000 per month. Fellowships awarded for one, two or three quarters will also provide tax-free resident fees and nonresident tuition, if applicable. Awardees must register for twelve units of upper-division and graduate-level work each quarter and must remain in good academic standing, as described under "Standards of Scholarship," of this catalog.

Fellows and trainees on twelve-month tenure are required to devote full time to graduate study and research during the summer as well as during the academic year. A brief resume of proposed summer graduate study or research, approved by the appropriate adviser, must be filed with the dean of Graduate Studies before the end of the spring quarter preceding the summer portion of the fellowship or traineeship tenure.

Some fellowships and traineeships offer the privilege of participation in the teaching or research programs of the university.

The principal types of fellowships at UCSD are the following:

1. Regents Fellowships
2. San Diego Fellowships
3. Fee Scholarships
4. Tuition Scholarships
5. Tuition and Fee Scholarships
6. U.S. Public Health Service Predoctoral Traineeships
7. Research Fellowships

### **ASSISTANTSHIPS**

Graduate students may be employed by UCSD on a part-time basis as research assistants and teaching assistants.

Graduate students enrolled full-time (twelve units or more) may be employed 50 percent time (twenty hours/week) during the academic year and 100 percent time during the summer months. Students enrolled for less than full-time (one to eleven units) are eligible, at the discretion of the department, for 25 percent time appointments. Appointees must remain in good academic standing, as described under "Standards of Scholarship."

Graduate students who are employed as research assistants are eligible for remission of tuition and fees if they have a minimum 25 percent appointment for the entire quarter for which tuition and fees are paid, or the dollar equivalent; have an appointment effective with the first week of instruction in the quarter for which tuition and fees are paid; and are within the time limits for support described earlier in this section. Teaching assistantships do not include payment for tuition and fees in the same manner as research assistantships; however, students who have a minimum 25 percent appointment for the entire quarter as a teaching assistant will have their health insurance fee paid.

### **TAXABILITY OF AWARDS**

The Tax Reform Act of 1986 made significant changes in the tax treatment of graduate student support awards. For merit-based awards made after August 16, 1986, the new tax law took effect January 1, 1987, as follows:

1. *Fellowships and Scholarships for Ph.D. and Master's Students.* Funds used for tuition, fees, books, and course-related expenses are *not* taxable income. Stipends used for other purposes are taxable income.
2. *Research and Teaching Assistants.* All salaries are taxable income.
3. *Research Assistant Tuition and Fee Remission.* RA tuition and fee remission will be excluded from taxable income based on a recently passed amendment to the Tax Act.
4. *Grants for Travel to Scholarly Meetings and for Graduate Student Research Expenses.* Not taxable.
5. *Awards to Postdocs and Non-Degree Graduate Students.* Tuition and fee awards, stipends, and salaries are taxable.

Students are advised to review available tax materials and make their own decisions about tax withholding, reporting of income, excluding income from taxation, and filing required tax forms. UCSD departmental and central administrative staff are not able to advise individual students on tax matters.

Limited written tax information is available from academic departmental offices, Student Legal Services, and the Office of Graduate Studies and Research.

### **APPLICATION PROCEDURES**

**Entering students.** Obtain application materials from academic department, group, or school offices. Only one application form is needed to apply for graduate admission and for any of the following: fellowships, traineeships, scholarships, and assistantships (teaching, language, or research).

In order for an applicant to be considered for a fellowship, traineeship, or graduate scholarship for the ensuing academic year, an application for admission with financial aid and all supporting materials must be received by the deadline as listed in the Graduate Admission and Award Application. No assurance can be given that applications can be processed after stated deadlines. Applications for assistantships may be accepted after the deadline, but many departments offer assistantships at the same time they consider applications for fellowships. Therefore, applicants for these appointments are strongly urged to submit their applications as early as possible.

**Continuing and returning students.** Consult with their departments.

### **AWARD NOTIFICATION**

The awarding of fellowships and similar awards for the following academic year will be announced not later than April 1. UCSD subscribes to the agreement of the Council of Graduate Schools of the United States, under which successful applicants for awards are given until April 15 to accept or decline such awards. An award accepted from one of the member universities may be resigned at any time through April 15. However, an acceptance given or left in force after that date commits the student not to accept another appointment without first obtaining formal release for that purpose.

### **LOANS AND GRANTS-IN-AID**

An excellent package of grants-in-aid, work-study, and loans is available to graduate students who show evidence of financial need as determined by analysis of a completed Student Aid Application for California (SAAC).

See section on financial assistance in chapter entitled "Campus Services and Facilities."

### **TIME LIMITS FOR GRADUATE STUDENT SUPPORT**

For Ph.D. students, all financial support administered by UCSD (including fellowships, scholarships, and employment but excluding loans) is restricted to students who are within their departmental support time limits (see "Ph.D. Time Limits" and description of each department's graduate program). Within these limits, students can be employed as teaching and language assistants for a maximum of six years. Absolutely no exceptions beyond the sixth year are permitted by university-wide policy.

M.F.A. and M.P.I.A. students can be supported for a maximum of ten quarters. M.A. and M.S. students can be supported for a maximum of seven quarters.

### **FELLOWSHIPS AND RESEARCH AWARDS FROM OUTSIDE THE UNIVERSITY**

In addition to fellowships, traineeships, and loans administered by the university, other types of graduate student support are available through federal agencies and private foundations. Students wishing to explore such sources of support for their studies at UCSD are urged to consult one of the many directories available in the reference section of the Central University Library, through the reference departments of other large libraries or the fellowship adviser in the Office of Graduate Studies and Research, 518 Matthews Administrative and Academic Complex. Most application deadlines occur in the fall or early winter. Among the many organizations which award fellowships to students at UCSD are the Alcohol, Drug Abuse and Mental Health Administration; AT&T; Department of Defense; the Ford Foundation; the Hertz Foundation; the Hughes Aircraft Company; IBM; Institute of International Education; the National Aeronautics and Space Administration; the National Science Foundation; the Pharmaceutical Manufacturers

Association Foundation; the Social Science Research Council; the Woodrow Wilson National Fellowship Foundation; and the Jacob Javits Fellowship Program.

California residents may apply for a California State Graduate Fellowship through the California Student Aid Commission to assist in payment of the university registration fee, the student center fee, and the educational fee. The deadline for application is at the beginning of March, and application materials and additional information can be obtained in mid-December from departmental offices, the Office of Graduate Studies and Research, or the Student Financial Services Office.

### **GENERAL POLICIES AND REQUIREMENTS**

#### **INTEGRITY OF SCHOLARSHIP**

Graduate students are expected to adhere to the highest standards of academic integrity and honesty.

#### **STUDENT CONDUCT**

Graduate students enrolling in the university assume an obligation to conduct themselves in a manner compatible with the university's function as an educational institution. Rules concerning student conduct, student organizations, use of university facilities, and related matters are set forth in *UC San Diego Campus Regulations Applying to Campus Activities, Organizations, and Students*, copies of which are available at the Office of Graduate Studies and Research, and the Office of Judicial Affairs.

#### **STUDENT APPEALS**

Because department chairs—in consultation with faculty colleagues—have primary responsibility for maintaining the excellence of graduate programs, and because faculty within a department are in the best position to judge their students' academic performance, graduate student appeals of an academic nature (i.e., course grades, examination results) should first be made to the individual faculty member involved, and, if necessary, the department chair.

Graduate students may appeal a course grade only if they believe that nonacademic criteria were used in determining their grade. Students who wish to appeal a course grade



should follow the procedure described in "Grade Appeals."

Graduate students who wish to appeal actions of individual faculty, departments, or administrators relating to their academic program or financial support may do so if:

1. They feel that due process was not followed in arriving at a decision which resulted in disqualification.
2. They feel that personal prejudice affected the academic judgment rendered.

Students wishing to appeal a decision on these grounds should address such appeals to the dean of Graduate Studies.

In resolving student appeals, the dean of Graduate Studies may seek a review and recommendation by the Graduate Council.

### EXCEPTIONS

A student may request an exception to the normal procedures and requirements governing graduate studies by submitting a General Petition, available from the department. The petition must state clearly the reasons for requesting the exception and bear all required approvals before being filed with the Office of Graduate Studies and Research.

Requests for exceptions to time limits require a letter of explanation and support from the student's research adviser, and support and justification from the program's graduate adviser and endorsement by the department or group chair. Such requests are submitted to the Graduate Council through the dean of Graduate Studies. Exceptions to the time limits policy are granted only in the case of truly exceptional and unavoidable circumstances. Exceptions to normative time are not granted.

### GRADES

#### STANDARDS OF SCHOLARSHIP

Only upper-division, graduate, and professional courses in which grades of A, B, C (including plus [ + ] or minus [ - ]), D, or S (Satisfactory) are earned can be counted in satisfaction of the requirements for a higher degree.

A student's grade-point average (GPA) is computed by dividing the total number of grade points earned by the total unit value of graded upper-division, graduate, and professional courses undertaken at UCSD with the

exception of those undertaken in UCSD Extension. Grades of S, U, I, IP, NR, and W are excluded in computing a grade-point average. Lower-division course work must be taken on an S/U basis, and the units are not used in computing a graduate student's grade-point average nor in satisfying program requirements for a higher degree with the exception of language courses taken by students in the M.P.I.A. program.

Each department or group prepares, not later than the second week of each spring quarter, a detailed, written evaluation of each of its Ph.D. or M.F.A. students. These evaluations are designed to inform students of their progress and to improve communications between faculty and graduate students. Evaluations are discussed with students who may elect to add written comments before signing the copy of the evaluation sent to the Office of Graduate Studies and Research. A student's signature on the evaluation indicates knowledge of the assessment but does not necessarily signify agreement.

To be in good standing academically a graduate student must meet departmental standards including a satisfactory spring evaluation, maintain a GPA of 3.0 in upper-division, graduate and professional course work, and must not have accumulated more than a total of eight units of F and/or U grades overall, unless departmental standards specify more stringent grade requirements.

Good standing is a requirement for:

1. Holding academic and staff appointments.
2. Holding fellowship, scholarship, or traineeship appointments.
3. Advancing to candidacy for a graduate degree.
4. Going on leave of absence.
5. Receiving a graduate degree from UCSD.

Graduate students who are not in good standing for any reason are subject to probation and/or disqualification from further graduate study.

### GRADING SYSTEM

The grade of A +, when awarded, represents extraordinary achievement but does not receive grade-point credit beyond that received for the grade of A. The grades of A, B, and C may be modified by plus ( + ) or minus ( - ). When attached to the grades of B and C, plus ( + ) grades carry three-tenths of a grade point more per unit, and when attached to A, B, and

C, minus ( - ) grades carry three-tenths of a grade point less per unit.

Grades and grade points are described as follows:

Grade	Grade Points per Unit
A +	4.0
A Excellent	4.0
A -	3.7
B +	3.3
B Good	3.0
B -	2.7
C +	2.3
C Fair	2.0
C -	1.7
D Poor	1.0
F Fail	0.0
S Satisfactory (equivalent to B - or better)	0.0
U Unsatisfactory	
I Incomplete— but work of non-failing quality*	
IP In Progress (provisional grade; replaced when full sequence is completed)	
W Withdrawal (assigned when withdrawing or dropping a course beginning fifth week to end of ninth week of instruction)	

\*Requires Request to Receive Grade Incomplete form to be initiated and completed by the student, approved by the instructor, and filed with the department prior to the end of finals week. The Incomplete grade will lapse to F or U if not made up by the last day of finals week in the following quarter.

All grades except Incomplete and In Progress are final when entered in an instructor's course report filed at the end of the quarter.

While grades of U are not computed in a grade-point average, they are not considered satisfactory grades for students on appointment, nor are they considered to be evidence of satisfactory progress on the part of any student. Therefore, a student whose record bears more than eight units of U and/or F grades in upper-division, graduate, or professional course work may not be eligible to continue on appointment and may be subject to academic probation or disqualification.

### CHANGES IN GRADES

All grades except I and IP are final when filed by the instructor unless a clerical or procedural error is discovered.

No change of a final grade may be made on the basis of revision or augmentation of a student's work; no term grade except Incomplete may be revised by further examination; and no



## GRADUATE STUDIES

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grade may be changed after one calendar year from the time the grade was recorded.

### **NR (NO REPORT)**

An NR is a computer-produced abbreviation assigned by the registrar to indicate that the student was listed on a grade report, but no grade was entered by the instructor; or that the assigned grade did not agree with a grading option approved for the student. When an NR appears on a record, the student should take steps **immediately** to see that the NR entry is removed. An NR which has not been removed by the last day of finals week in the quarter after it was assigned shall lapse to a permanent F or U grade.

### **I (INCOMPLETE)**

The grade of I may be assigned by an instructor only when the student's work is of passing quality but is incomplete. The student must complete and submit to the instructor the form, Request to Receive Grade Incomplete and Removal of Grade Incomplete, which will contain both the reason for requesting the grade I and the conditions to be met before the Incomplete can be replaced with a final grade. The Incomplete must be made up, the grade assigned, and the completed form filed with the Office of the Registrar no later than the end of final examination week the following quarter.

Incomplete grades assigned in the quarter before a graduate student withdraws or takes an approved leave of absence must be replaced by a final grade before the end of the academic quarter following to prevent the Incomplete from lapsing to F or U.

### **IP (IN PROGRESS)**

An IP is assigned in a sequential course which extends over more than one quarter, and the evaluation of a student's performance may not be possible until the end of the course. A student who has dropped out without completing the entire sequence may be assigned final grades and unit credit for any quarter(s) completed, provided that the instructor has a basis for assigning the grades and certifies that the sequence was not completed for good cause. An IP not replaced by a final grade will remain on the student's record. Courses graded IP are not used in calculating a student's grade-point average until graduation. At that time course units still graded IP on a student's record must be treated as units attempted in calculating the

GPA; **thus units graded IP will be considered lapsed to Fs or Us.**

### **S/U (SATISFACTORY/ UNSATISFACTORY)**

The minimum standard of performance for a grade of Satisfactory shall be the same as the minimum for a grade of B -.

With the approval of the Graduate Council, departments may offer graduate courses in which graduate students may elect to be evaluated on an S/U basis and courses in which S/U grading shall be the *only* grading option. Grading options for a given course are identified in course listings in the *General Catalog*.

In addition, and with the approval of the department and the instructor concerned, graduate students may elect to have the following courses graded on an S/U basis: any upper-division course taken (provided they have obtained approval of the instructor and the department), and any graduate or upper-division course outside their major department. If departmental requirements have been fulfilled for advancement to candidacy for the Ph.D. degree, graduate students may take any course on an S/U basis. All lower-division course work and noncredit courses shall be graded only on an S/U basis with the exception of language courses taken by students in the M.P.I.A. program.

Selection of S/U as a grading option **must be made in the first two weeks of a quarter**. Units graded Satisfactory shall be counted in satisfaction of degree requirements but shall be disregarded in determining a student's grade-point average. No credit shall be allowed for work marked Unsatisfactory.

### **W (WITHDRAWAL)**

Students who discontinue graduate study any time during a quarter without formally withdrawing will receive failing grades for all course work undertaken. Formal withdrawal requires filing a Leave of Absence, Extension and/or Withdrawal form prior to leaving campus with the Office of Graduate Studies and Research after receiving departmental approval and all other approvals listed on the form. When a student withdraws before the end of the fourth week of instruction, no course entries will appear on the transcript for that quarter. Students who withdraw from the university or drop a course between the beginning of the fifth week of instruction and the

end of the ninth week of instruction will be assigned a W (Withdrawn) by the registrar for each course affected.

Courses in which a W has been assigned will be disregarded in determining a student's grade-point average.

### **REPETITION OF COURSES**

A student assigned a grade of D, F, or U may petition to repeat the course on the same grading basis for which it was first taken. That is, a course in which a grade of D or F has been received may not be repeated on an S/U basis. Conversely, a course in which a grade of U has been awarded may not be repeated on the basis of a letter grade. Degree credit for a course will be given only once, but the grade assigned for each enrollment shall be permanently recorded. Only the grade received in the repetition of the course will be used in calculating the overall grade-point average for the first sixteen units repeated. For additional units repeated, the grade assigned for each enrollment shall be used in calculating the grade-point average.

### **FINAL GRADES**

An unofficial report of the quarter's grades is sent to each student at the end of fall and winter quarters. An unofficial copy of the complete transcript is sent to each student at the end of every spring quarter. While grade reports submitted by instructors at the end of the quarter are generally considered final, **students should carefully examine their grade report or transcript for omissions and clerical errors and consult with instructors and the Office of the Registrar to clarify any discrepancies.**

### **ADMISSION REQUIREMENTS**

#### **ACADEMIC**

Applicants for graduate admission must present official evidence of receipt of a baccalaureate degree from an accredited institution of higher education or the equivalent, with training comparable to that provided by the University of California. A minimum scholastic average of B or better is required for course work completed in upper-division, or prior graduate study.

## ADMISSION POLICIES

### *DUPLICATION OF ADVANCED DEGREES*

Normally, duplication of advanced degrees is not permitted. A professional degree is not regarded as a duplication of an academic degree.

### *NON-DEGREE STUDY*

There is no "student-at-large" classification at UCSD; application for admission must be made to a specific department or group. Applicants who wish to enroll for "course work only" within a department or group and who do not intend to pursue a higher degree at UCSD may request admission for non-degree study. Applicants for non-degree study must satisfy all admission requirements and are not eligible for fellowships or assistantships. Non-degree status is granted for up to one year; students may petition the dean of Graduate Studies for a second year of non-degree status.

### *PART-TIME STUDY*

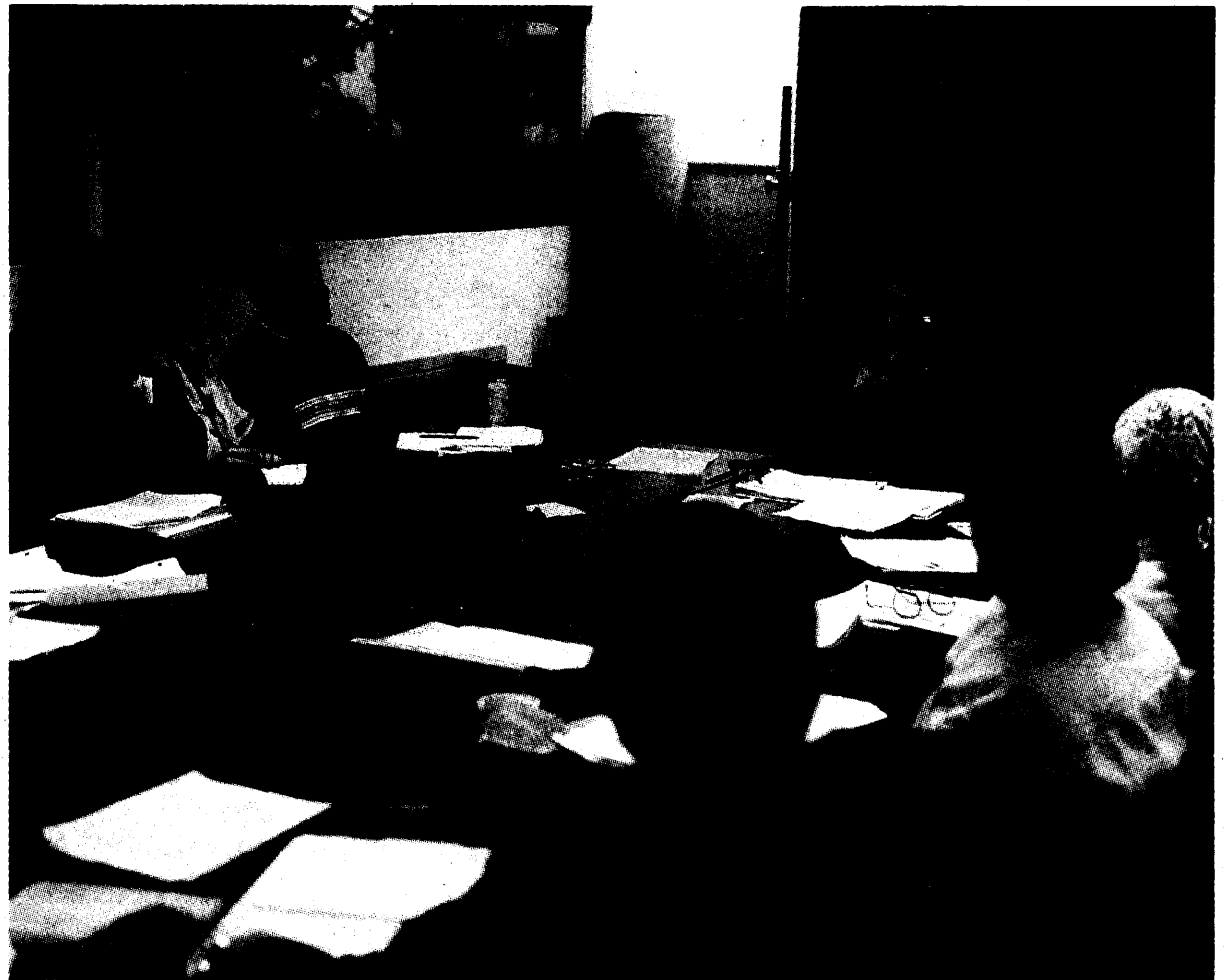
Students who enroll in fewer than twelve graduate or upper-division units each quarter are considered part-time students. Students who are approved by their major department and by the dean of Graduate Studies for enrollment in a program of half-time study (maximum of six units or fewer) for reasons of occupation, family responsibilities or health, may be eligible for a reduction in fees. All other part-time students must pay the same fees as full-time students.

Less than full-time study may be pursued in several masters' programs and a few Ph.D. programs at UCSD. In all instances, part-time students must satisfy the same admission requirements as full-time students and are eligible, at the discretion of a department, for appointment to 25 percent time teaching or research assistantships.

## APPLICATION PROCEDURES

### *WHEN TO APPLY*

Applicants for admission who wish to be considered for a fellowship, traineeship, graduate scholarship, or assistantship should refer to "Financial Assistance—Application Procedures." Most programs have an application



deadline of January 15 for fall admissions. A few programs accept applications for winter and spring admissions. For specific deadlines refer to the Graduate Admission and Award Application form or contact the specific program office.

Applicants need not have completed their undergraduate programs in order to apply. However, when an applicant's grades or preparation appear to be marginal, the department, group, school, or the Office of Graduate Studies and Research may defer action upon an application until a supplementary record or evidence of the receipt of a degree becomes available.

### *HOW TO APPLY*

Applicants must complete a Graduate Admission and Award Application and submit it, together with a nonrefundable application fee of \$40, to the Office of Graduate Admissions. An application and additional program and application information are obtained from the graduate office of the program to which the applicant is applying. To obtain the application, call or write the graduate office of the specific program to which you are applying. Telephone numbers and campus addresses are listed with the department information in this catalog, and the street address for all depart-

ments is 9500 Gilman Drive, La Jolla, California 92093. (Only one application is needed to apply for admission to graduate study and for a fellowship, traineeship, scholarship, or assistantship.) Detailed instructions as to how to complete the application appear within the application booklet. The documents which are required in support of an application for graduate admission are listed below.

### *SOCIAL SECURITY NUMBER DISCLOSURE*

Pursuant to the Federal Privacy Act of 1974, applicants are hereby notified that disclosure of their Social Security number is mandatory. The Social Security number entered on the application for graduate admission is used as the applicant's identification number in the UCSD graduate student record-keeping system. This record-keeping system was established prior to January 1, 1975 pursuant to the authority of the Regents of the University of California under Art. IX, Sec. 9 of the California Constitution.

### *REQUIRED SUPPORTING DOCUMENTS*

All supporting documents—including letters of recommendation—should be forwarded

directly to the applicant's prospective major department, group, or school.

### ACADEMIC RECORDS

Applicants must request that official transcripts of all previous academic work, including certification of degrees received or documentation of status upon leaving each institution, be forwarded to their prospective major department. Transcript labels are enclosed in the application packet for this purpose. Only official records bearing the signature of the registrar and the seal of the issuing institution will be accepted. Applicants with academic work in progress who expect to complete a degree program before the intended date of enrollment at UCSD **must submit evidence of degree conferral** and a final academic record, as soon as they are available.

### SPECIAL NOTE TO FOREIGN APPLICANTS

In all applications for graduate admission, official records bearing the signature of the registrar or other responsible academic officer and the seal of the issuing institution are required. However, true copies, facsimiles, or photostatic copies of **foreign academic records** will be accepted if, after the copies have been made, they have been personally signed and stamped by an educational official **who certifies that they are exact copies of the original document**. Properly signed copies should be sent instead of irreplaceable original documents. Unless academic records are issued in English by the institution itself, **certified English translations must accompany official documents written in a language other than English**.

Foreign academic records should show all courses attended each year, examinations passed, seminars completed, and grades or marks received in all institutions where formal records are maintained. **Official evidence of degree conferral must also be supplied**, together with evidence of rank in class if possible.

### GRADUATE RECORD EXAMINATIONS (GRE) SCORES

Most graduate programs require that applicants take the GRE. Contact the specific program for further information. Applicants who are applying for admission to a department, group, or school which requires that they take the GRE (see Graduate Application for Admis-

sion and Financial Aid Information and Instruction Sheet) should do so as early as possible to insure the timely receipt of their score results. **Applicants must take the GRE no later than December in order to meet most departmental deadlines for admission**. The GRE is administered five times a year in the United States and in 133 other countries. In addition, several administrative service tests are given each year in major U.S. cities (dates change). Applications may be obtained from the Educational Testing Service, Box CN 6000, Princeton, New Jersey 08541-6000.

**To facilitate the processing of applications for admission, applicants may forward to their proposed major department, group, or school a copy of their GRE examination score as soon as it is received, since official copies are not always received by the appropriate department at UCSD.**

### LETTERS OF RECOMMENDATION

Applicants should arrange to have three letters of recommendation forwarded directly to their prospective major department, group, or school. (Recommendation forms are included in the application booklet.) Only one set of recommendation letters need be submitted in support of an application for admission and fellowship or assistantship consideration. It is most important that letters of recommendation be completed by individuals in a position to analyze an applicant's abilities and academic or professional promise. Applicants who have applied within the last two years, but did not enroll, should check with their major department or group to determine if letters of recommendation are still on file.

### FOREIGN APPLICANT FINANCIAL STATEMENT

**Foreign applicants are required to certify that they possess sufficient funds to cover all fees, transportation, and living expenses during the first academic year of graduate enrollment at UCSD**. In addition, they must certify as to the probability of funds for subsequent years of study. A Foreign Applicant Financial Statement, for the purpose of indicating the amount and source of funds available for graduate study, is forwarded to foreign applicants upon acceptance into a graduate program. A written summary of pres-

ent and future financial resources must be provided before visa forms can be granted.

Opportunities for employment on or off campus, are extremely limited, and foreign applicants should not base their educational plans on the hope of finding employment after arriving in the United States.

### NATIONAL EXAMINATION INFORMATION

There are a variety of nationally administered examinations which may be taken to meet requirements for admission to graduate study or to satisfy certain requirements for advanced degrees. Several examinations of importance to UCSD students are listed here.

### GRADUATE SCHOOL FOREIGN LANGUAGE TESTING PROGRAM (GSFLT)

**Address:** Educational Testing Service, Box 519, Princeton, New Jersey 08541.

**Purpose:** To measure ability to read and understand literature in French, German, Russian, or Spanish in order to meet foreign language requirements for advanced degrees.

**Application:** Information and forms are available from San Diego State University Testing Office, Library East, Room 405, 5300 Campanile Drive, San Diego, California 92182-0577. Telephone: (619) 594-5216.

Tickets are available the first of the month prior to the month in which the examination is given. Students should arrange to pick up a ticket of admission at the testing office a few days before the scheduled examination. It is impossible to do this the same morning as the test.

**Examination Schedule:** Four times a year (dates change each year).

**Fee:** \$10\*

### TEST OF ENGLISH AS A FOREIGN LANGUAGE (TOEFL)

All foreign applicants whose native language is not English and whose undergraduate education was conducted in a language other than English must take the TOEFL and submit their test scores to the Office of Graduate Admissions.

Applicants who are admitted with a total TOEFL score of less than 550 may be required to take an English proficiency test upon arrival at UCSD and to enroll in an English course until the required proficiency is attained.

\*Subject to change

**Application:** Information and forms are available from TOEFL Services, P.O. Box 6151, Princeton, NJ 08541-6151, or from United States embassies, consulates, and related centers; and the San Diego State University Testing Office, Library East, Room 405, 5300 Campanile Drive, San Diego, California 92182-0577. Telephone: (619) 594-5216.

Applications must be submitted to TOEFL Services at least *six weeks* prior to the scheduled examination date.

**Examination Schedule:** One day each month (dates change each year) in approximately 135 countries.

**Fee:** Consult the current TOEFL booklet for fees.

### TEST OF SPOKEN ENGLISH (TSE)

**Address:** Educational Testing Service Box 6157, Princeton, New Jersey 08541-6157.

**Purpose:** To help foreign students provide a reliable measure of proficiency in spoken English. This test is highly recommended for foreign applicants for teaching assistantships.

**Application:** Same as TOEFL above.

**Examination Schedule:** Nine times a year (dates change each year) in approximately 135 countries.

**Fee:** Consult the current testing booklet for fees.

Foreign applicants who wish to be considered for a teaching assistantship are urged to submit scores on the Test of Spoken English (TSE), which is given at TOEFL test centers throughout the world (approximately 185 countries), one day each month (dates change each year).

### ADMISSION AND REGISTRATION

Official admission to graduate study at the university is contingent upon review of an applicant's record, receipt of final undergraduate transcript showing degree(s) awarded, an affirmative recommendation by the prospective department, group, or school, and action by the Office of Graduate Studies and Research. The dean of Graduate Studies or the prospective major department, group, or school may deny admission if an applicant's scholastic record is undistinguished, if the preparation is judged inadequate as a foundation for advanced work, or in the event that no further students can be accommodated for a given quarter. **Only the official Certificate of Admission from the dean of Graduate Studies constitutes for-**

### mal approval of admission to a graduate program at UCSD.

Official notification of admission by the dean of Graduate Studies will be mailed well in advance of the beginning of the quarter for which application has been made. Applicants should call their prospective major department, group, or school if formal notification is not received four weeks prior to the beginning of the quarter for which they applied.

Admission to graduate standing does not constitute registration for classes. A student is not officially registered for classes until the entire registration procedure is completed each quarter. Information and all necessary registration materials will be available at department, group, or school offices approximately two weeks before the opening of the quarter (see "Academic Calendar").

### REAPPLICATION

Applicants who are admitted and fail to register in the quarter for which they first apply may request deferral of their application for a later quarter within the same academic year. Application for admission of a deferred applicant for the subsequent academic year may be made by submitting a statement of activities and official transcripts of any academic work undertaken since the first application to the department or group. Admission is not guaranteed to previously admitted applicants who request a deferral. In no case are application files retained for more than four consecutive academic quarters from the date of first admission. Application after this period may be made only by completing a new application and providing all necessary documents, including payment of the graduate application fee.

**Students who are denied admission must submit a new application together with requested documentation in order to be considered for admission in another academic year.**

### READMISSION

A graduate student whose status has lapsed because of an interruption in registration must petition his or her department for readmission at least eight weeks prior to the first day of the quarter in which reenrollment is intended. Students must submit supplementary transcripts of all academic course work undertaken since last enrolled at UCSD, pay a readmission fee of \$40, and complete a General Petition and a

supplementary Statement of Activities. In addition, a Statement of Legal Residence is required for all students returning after an absence of two quarters or more.

**Readmission is not automatic.**

### REGISTRATION REQUIREMENTS AND PROCEDURES

All students must enroll and pay fees on or before the deadline dates established by the Office of the Registrar for each quarter. Enrollment materials are obtained at the major department. (See *Schedule of Classes* for current deadlines.)

### FULL-TIME STUDENT

A full-time student is required to be registered for twelve units each quarter of each academic year until the completion of all requirements for the degree, including the filing of the thesis or dissertation.

### PART-TIME STUDENT

A part-time student is enrolled in fewer than twelve units a quarter but is admitted as a regular student. A part-time student must pay full fees unless approved by the dean of Graduate Studies to enroll in half-time status for six units or fewer. (See "Part-Time Study.")

### SCHEDULE OF CLASSES

Detailed information on registration and enrollment procedures is contained in the quarterly *Schedule of Classes*, available for purchase at the University Bookstore several weeks before the beginning of the quarter.

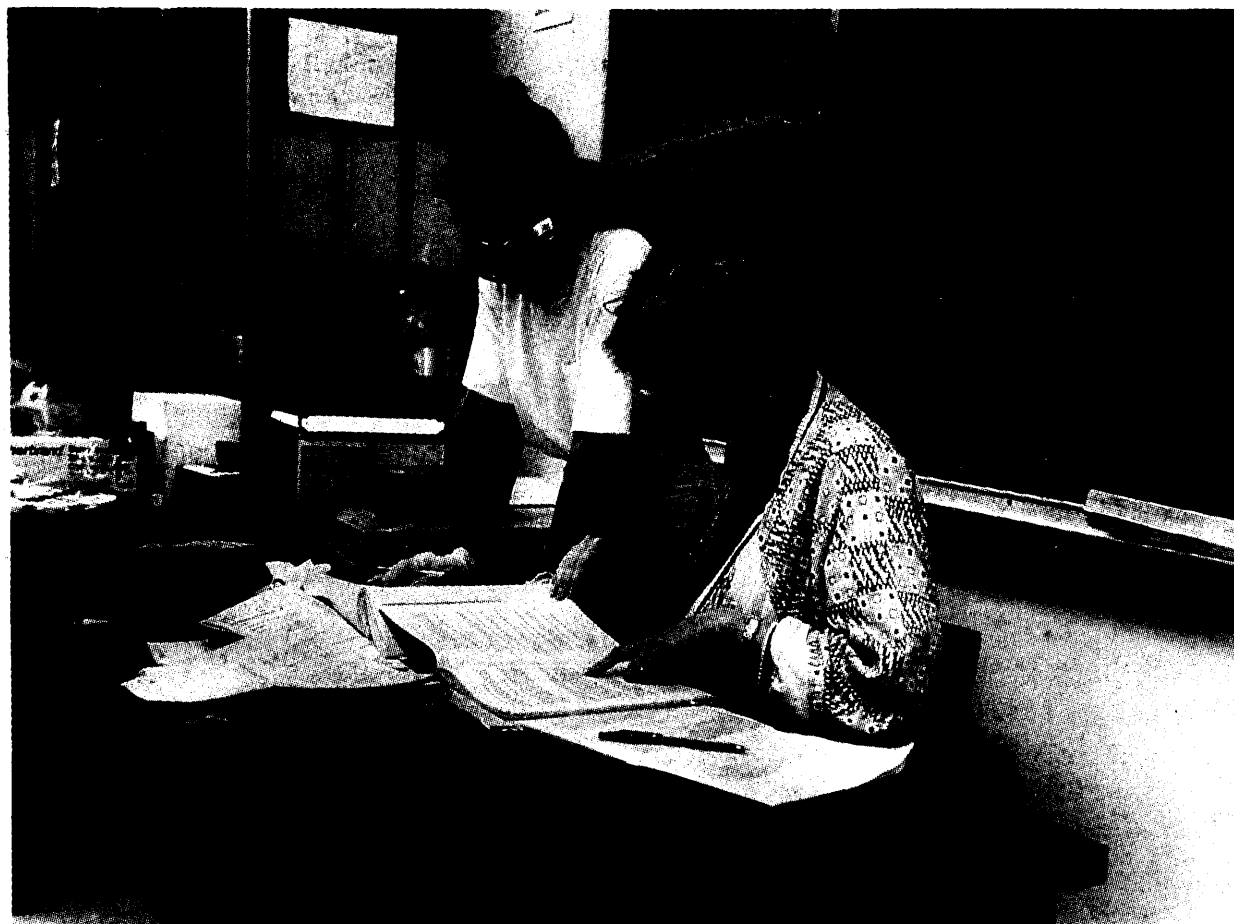
### PRIORITY ENROLLMENT

#### Continuing Students

Continuing graduate students may enroll any time during Priority Enrollment by telephone. A Personal Access Code (PAC) number is issued to graduate students by the Office of the Registrar. These PAC numbers will be released by the department after required advising has taken place, or directly to the student if adviser approval is unnecessary. Students who do not want to use the telephone may complete Add/Drop Cards and file them with the Office of the Registrar any time during enrollment periods.

Complete instructions for enrolling by telephone (T-REG) or Add/Drop Cards can be found in the quarterly *Schedule of Classes*.





Although confirmation of classes is immediate by telephone, students will also receive a written confirmation by mail prior to the start of instruction. Students should review this confirmation carefully and report any discrepancies to the Office of the Registrar. Students will be considered enrolled in all courses listed on the confirmation. Unofficial withdrawal from a course listed on the confirmation will result in a failing grade.

### **New Students**

New students enroll just prior to the start of instruction during enrollment periods. New students may enroll by telephone after receiving adviser approval, or may complete Add/Drop Cards and file them with the Office of the Registrar.

### **REGISTRATION RECEIPT**

Upon payment of fees, the Cashier's Office will provide a cash register receipt and will affix a validation sticker to the back of the Student Photo-Identification Card.

### **STUDENT PHOTO-IDENTIFICATION CARD**

A validated Student Photo-Identification Card is the official ID for registered students and entitles the student to library privileges, a

student health card, and use of other university facilities, as well as for purchasing tickets and/or admission to certain university events and voting in student body elections.

If the Student Photo-Identification Card is lost, students may obtain a duplicate at the Campus Card Services Office, 508 Matthews Administrative and Academic Complex; if the Registration Receipt is lost, a duplicate may be obtained from the Cashier's Office (see "Fees").

The validation sticker is removed from the Student Photo-Identification Card when students withdraw or go on leave of absence.

UCSD graduate students on campus continuing their graduate studies or research during the summer months may request a Summer Validation Sticker from their major department, group, or school offices.

### **REGISTRATION PROCEDURES**

Students are considered enrolled when they have requested at least one course and space in it has been reserved. Every effort will be made to enroll students in their preferred class sections. Students are not considered registered until they have both enrolled in classes and paid registration fees.

### **PAYMENT OF REGISTRATION FEES**

Please refer to the "Undergraduate Registration" portion of this catalog or the quarterly *Schedule of Classes* which outlines procedures for payment of registration fees.

#### **Note to Fellowship, Scholarship, or Traineeship Holders:**

The first billing statement will be sent to the major department, group, or school about one month prior to the start of each quarter. Fees and tuition awarded to pay registration fees will be credited to the graduate student's account and appear on the statement as a payment or credit. Each award recipient should carefully check the amounts listed on the statement against the graduate award letter and contact the Office of Graduate Studies immediately at 534-6464 if there is a discrepancy. Graduate students with partial fee and/or tuition awards will be required to pay the balance by the fee deadline to complete their registration.

Fellowship, scholarship, or traineeship holders must enroll in and maintain full-time enrollment status (at least twelve units per quarter).

#### **Note to Teaching and Research Assistants:**

TAs, RAs, and associates may pay resident fees but not nonresident tuition by payroll deduction, so long as (1) their appointment extends through the end of a quarter, (2) their appointment is at a fixed percentage, (3) their salary is at least equal to the fee amount, and (4) their fees are not paid by the RA Tuition/Fee Remission Program.

Eligible students should bring a copy of their signed employment form and completed application papers for this program to the Office of Graduate Studies and Research five to six weeks in advance of fee payment deadlines.

Students who have a research assistantship and are eligible for RA tuition and fee remission will receive credit on the billing statement.

6. Proceed as indicated to obtain validation of registration as follows:

*New Students* who do not have a photo-ID card at the time they pay fees should go to the Campus Card Services Office, 508 Matthews Administrative and Academic Complex, and a card will be produced. The card may be picked up at the Cashier's Office where the validation sticker will be affixed.



*Continuing Students* paying fees in person should present their photo-ID card at the time of payment and the cashier will affix the validation sticker for the current quarter to the back of the photo-ID card.

7. Make all necessary changes (additions and deletions) to the Class Confirmation Card, using add/drop cards, before the end of the second week of the quarter to avoid penalties. **(Full-time graduate study requires enrollment in a minimum of twelve units each quarter.)**

8. Return the Student Information Card to Office of the Registrar *only* if corrections are necessary in the printed information.

### **CONTINUOUS REGISTRATION**

All graduate students are required to be registered each quarter until all degree requirements have been completed, including filing of the thesis or dissertation and the final examination, or to be on an approved leave of absence.

A student who fails to register or to file an approved leave of absence form by the registrar's deadline date (no later than the end of the second week each quarter) will be assumed to be withdrawn from UCSD and will be dropped from the official register of graduate students. In addition, all outstanding incomplete grades, and NRs assigned by the registrar, will lapse to Fs or Us unless cleared by the end of the current quarter. A student who is on leave of absence or who has withdrawn from the university is not entitled to withdraw books from the library or to use other university facilities or faculty time. A student who is withdrawn must petition for readmission to resume study at a later date, pay the nonrefundable readmission fee, and be considered for readmission with all others requesting admission to that quarter.

Ph.D. degree candidacy will lapse for graduate students who fail to register and are not granted a formal leave of absence. To be reinstated to candidacy, a graduate student must be readmitted, enroll and register, be readvanced to candidacy, and pay the candidacy fee.

### **LATE REGISTRATION/ DEADLINE AND PENALTY FEES**

Students will be assessed late fees if not enrolled and registered by the registrar's pub-

lished deadlines outlined in this catalog and the quarterly *Schedule of Classes*. Please refer to the "Undergraduate Registration" portion of this catalog or to the quarterly *Schedule of Classes* for additional information.

Additionally, a \$50 late enrollment fee will be assessed students who do not enroll in classes prior to the end of the second week of instruction.

A student who has not completed registration (enrolled and paid fees) by the registrar's deadline date **must petition for permission to register late and will pay late fees totalling \$100.**

### **CHANGES IN COURSE SELECTION**

Drop/Add Cards reflecting changes in class enrollment must be filed with the Office of the Registrar in order for the student to receive credit for added courses and be relieved of responsibility for dropped courses.

Drop/Add Cards must be completed in full and include correct course information and course codes as listed in the current *Schedule of Classes*.

After enrolling in courses, a student may add courses, change sections of a given course, or change grading options up to the end of the second week of instruction without fee by completing a Drop/Add Card available at the Office of the Registrar. Students must obtain approval of their graduate adviser or department. See *Schedule of Classes*, "Changes of Programs."

A student may drop a class up to the end of the ninth week of classes by filing a Drop/Add Card with the registrar, **after** first notifying the instructor, and obtaining the approval of the graduate adviser or department and the dean of Graduate Studies. If the course is dropped before the end of the fourth week of classes, no course entry will appear on the student's transcript. Courses dropped after the end of the fourth week of instruction and before the end of the ninth week of instruction will remain on the transcript as permanent entries showing course number and title, and the registrar will assign a final grade of W, signifying Withdrawal.

Students may not drop courses after the end of the ninth week of instruction and will receive the earned grade or an Incomplete, if applicable. When a grade in a course has been assigned in accordance with the Academic

Senate policy on Integrity of Scholarship, a student may not subsequently change that grade by dropping the course or withdrawing from the university.

### **ENROLLMENT LIMITS**

**A full-time graduate student in a regular quarter is expected to enroll in twelve units of upper-division or graduate course work** with the exception that in the Graduate School of International Relations and Pacific Studies the normal course load is sixteen units. A student who wishes to take units in excess of these limits must obtain the approval of the graduate adviser or department chair.

Graduate students holding half-time appointments as research assistants, teaching assistants, language assistants, readers, or other employment titles, or who receive support from traineeships, fellowships, or scholarships paid through the university or directly to the student, must enroll and register for twelve units of upper-division and/or graduate course work and research each quarter.

Teaching units (500 series) above the full-time program of twelve units are not considered an overload.

Graduate students approved for half-time study are limited to a maximum of six units of upper-division or graduate course work each quarter.

### **CHANGES OF NAME OR ADDRESS**

Students must file official change of name or address forms with the Office of the Registrar when applicable.

### **LEAVE OF ABSENCE/ EXTENSION**

A student who discontinues graduate study with the intention of resuming during a later quarter files a formal Leave of Absence, Extension and/or Withdrawal form prior to leaving the campus. Graduate students must have completed at least one quarter of academic residence and be in good standing (GPA 3.0 minimum) to be granted a leave. All graduate students are limited to a maximum of three quarters of leave and/or withdrawal.

Prior to the end of the second week of instruction of the quarter in which the leave is to begin, a student must complete a Leave of Absence form and obtain required signatures as



listed under the clearance section of the form, and the approvals of the graduate adviser, chair of the (major) department, group, or school, and dean of Graduate Studies. If a student has registered, paid fees and enrolled for the quarter in which a leave is being requested, the validation sticker will be removed from the Photo-Identification Card. Graduate students may request an extension of an approved leave prior to the expiration of the leave, up to the maximum of three quarters in all degree programs.

A student who has a long-term loan is considered to be out of school while on a leave of absence and **must set up an exit interview with the Loan Records Office before leaving the campus.** Since rules and regulations pertaining to such loans are complex, it is to the student's advantage to determine loan requirements prior to seeking a leave of absence.

A student on leave of absence may not (1) be employed by UCSD, UCSD Medical Center or UC Extension, or hold a fellowship, traineeship, or similar appointment administered by the university, (2) use university facilities, (3) complete a qualifying examination for advancement to candidacy, or (4) place demands on faculty, including discussion of

thesis or dissertation work, either directly or by correspondence, during the period of leave.

A student may remain in student housing for one additional quarter providing he or she has been a full-time student (twelve units or more) for three consecutive quarters immediately prior to the leave of absence.

Students must return all borrowed library material if requesting a leave of absence or withdrawing.

A new Statement of Legal Residence is required for all graduate students **returning from a leave of absence of two quarters or more.**

### WITHDRAWAL

A student withdrawing from the university must obtain a Leave of Absence, Extension and/or Withdrawal form and secure appropriate signatures. The approved form must be filed with the Office of Graduate Studies and Research and the validation sticker removed from the Photo-Identification Card.

Students who withdraw during the first thirty-five days of instruction will receive refunds of fees in proportion to the number of *elapsed calendar days since the first day of instruction.* The date of withdrawal used in cal-

culating the refund shall be the date on which the approved notice of withdrawal is submitted to the Office of the Registrar.

A registered student who stops attending classes and fails to file a Leave of Absence, Extension, and/or Withdrawal form will receive a grade of F or U in each course, thus jeopardizing eligibility for readmission.

### BAR FROM REGISTRATION/ NONACADEMIC

After suitable warning, a student may be barred from further registration for a variety of nonacademic reasons, including failure to comply with official notices, to settle financial obligations when due, to complete medical examination requirements, to provide final undergraduate transcripts, or other related matters.

### BAR FROM REGISTRATION/ ACADEMIC

Academic disqualification is determined by the dean of Graduate Studies in consultation with the student's department, and normally relates to unsatisfactory academic performance, e.g., failure to maintain a grade-point average of 3.0 or better; failure to meet departmental criteria of performance; accumulation of more than eight units of F or U grades; or failure to comply with conditions set at the time of admission to a graduate degree program.

# CAMPUS SERVICES AND FACILITIES

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## **ACADEMIC SERVICES AND PROGRAMS**

### **ACADEMIC ADVISING**

The college academic advising offices and the academic departments are the designated campus units responsible for providing official academic advice and direction to undergraduate students. The college academic advising offices have primary responsibility for academic advice and services that assist new and continuing students to develop educational plans and course schedules which are compatible with their interests, academic preparation, and educational and career goals.

### **COLLEGE ADVISING OFFICES**

**Revelle, Revelle College Provost's Office, Mail Code 0321, (619) 534-3490**

**Muir, 2126 H&SS, Mail Code 0106, (619) 534-3580**

**Third, Third College Admin. Building, Mail Code 0509, (619) 534-4110**

**Warren, Literature Building, Mail Code 0422, (619) 534-4350**

**Fifth, 412 MAAC, Mail Code 0069, (619) 534-2235**

Specifically, the college academic advisers conduct academic orientation/registration programs for all new students and advise new and continuing students about college general-education and graduation requirements. The advising staff of each college provides general academic and curricular information, clarifies academic rules and regulations, reviews all aspects of academic probation, monitors academic progress, assists students with decision-making strategies, and provides information about major prerequisites as well as criteria for departments that screen students. In conjunction with the academic departments and the Office of the Registrar, the advising offices certify graduation and generally facilitate students' academic adjustment to the university.

Moreover, academic advisers are available to counsel students about educational alternatives, selection of courses and majors, program changes, new academic opportunities, and special programs such as exchange pro-

grams, honors programs, outreach programs, etc.

See your college academic adviser for assistance with academic concerns or referral to appropriate academic support units.

### **EDUCATION ABROAD PROGRAM (EAP)**

International Center (corner of Hutchison Way and Gilman Drive)

Mail code 0018  
534-1123

The Education Abroad Program provides students enrolled at the University of California an opportunity for an intercultural experience at UC centers located in Australia/New Zealand, Africa, Asia, Europe, Latin America and North America, while allowing normal progress toward a degree.

The program is described in detail in the "Courses, Curricula, and Programs of Instruction" section of this catalog under the "Education Abroad" heading.

Students interested in studying abroad should also see the entry on the Programs Abroad Office, below.

### **EDUCATION AT HOME PROGRAM (EHP)**

The Education at Home Program, coordinated by the Riverside campus, provides a unique educational opportunity for UCSD students who have a special interest in early American history and culture. Successful applicants spend nine weeks in Williamsburg, Va., one in Philadelphia, and a concluding week in Washington, D.C. The EHP is open to all UCSD undergraduates. Graduate students may apply with prior approval of their graduate adviser. Registration (as an "Intercampus Visitor" to the Riverside campus) will be made for three upper-division history courses listed in the Riverside catalog as History 157, 158, and 159. The EHP is normally available winter quarter each year. For further information and application forms, contact your college academic advising office. For more information call Susan Braddock in the Department of History at the Riverside campus at (714) 787-3820.

### **FOREIGN SCHOLAR ADVISER**

International Center (corner of Hutchison Way and Gilman Drive)

Mail code 0018  
534-3730

The foreign scholar adviser provides assistance to UCSD's foreign faculty, researchers, and postdoctoral fellows, in the areas of immigration and visa matters, financial, health, and personal issues. The adviser also informs campus departments about regulations and documentation pertaining to foreign visitors. The Friends of the International Center provide additional hospitality services and programs to foreign scholars and their family members.

### **FOREIGN STUDENT ADVISER**

International Center (corner of Hutchison Way and Gilman Drive)

Mail code 0018  
534-3730

The foreign student adviser provides assistance to UCSD's nonimmigrant undergraduate and graduate foreign students, including advising on immigration, financial, health, and personal matters. The foreign student adviser also coordinates campus programs such as orientation and check-in for new students, and provides support to international student organizations.

### **INSTRUCTIONAL COMPUTING CENTER**

Applied Physics and Mathematics Building, first floor

Mail code 0110  
534-4050

The Instructional Computing Center provides a wide range of computer services to support instruction, research, and administration, and provides administrative data to academic departments through its Academic Computing Services group. Site licensed software for minicomputers, workstations, and personal computers is distributed by the User Services group. Instruction and research computing is done on networked minicomputers, desktops, workstations, and personal computers using UNIX, MS-DOS, Macintosh, and VMS operating systems.

With these systems, students and researchers have access to a wide variety of computer languages, application packages, windowing environments, statistical procedures, and mathematical libraries. Graphics facilities include black-and-white and color workstations, interactive graphics terminals, four-color hardcopy plotting, a color printer, and laser printers. Text formatting programs are available for term papers, thesis production, journal articles, and books.

Students access the minicomputers by using interactive terminals located in terminal rooms, laboratories, libraries, and private offices around campus. Impact and laser printers in the terminal rooms are networked so that users can direct output to a nearby printer. Dial-in telephone lines are available for off-campus use of the minicomputers and for data transfers from personal computers. Each system has an on-line documentation program which gives keyed access to descriptions of the programs and facilities available on that system. The computer systems are accessible twenty-four hours a day, seven days a week. From time to time the Computing Center hires students as part-time operators, technicians, coders, and consulting aides. These jobs are posted in the Student Employment Office.

### **OASIS (OFFICE OF ACADEMIC SUPPORT AND INSTRUCTIONAL SERVICES)**

OASIS Main Office  
Galbraith Hall  
Room 1058  
Mail code 0336  
534-3760

The Office of Academic Support and Instructional Services (OASIS) provides a variety of services to maximize student performance and retention at the University of California, San Diego.

### **GOALS**

OASIS provides activities that support and contribute to the improvement of teaching and learning. Programs range from services to help students overcome past academic deficiencies to programs to help them excel in a subject matter or skill. Services also are provided to faculty interested in improving aspects of their teaching, and to faculty and staff interested in assistance with evaluation or research projects.

### **ELIGIBILITY FOR SERVICES**

All students in any of the five colleges are eligible for OASIS programs. Classes are non-credit and may be repeated. Course titles and schedules are printed in the *Schedule of Classes* and campus media. Student services are available in six locations: the Underground, the Second Story, the Third Place, the Warren Academic Services Center, Muir Residence Halls, and the OASIS Main Office.

### **The Academic Transition Program (ATP)**

ATP coordinates services to all Educational Opportunity Program/ Student Affirmative Action (EOP/SAA) freshman students and provides professional and peer counseling including in-depth interviews, analysis of academic background, and goal setting which lead to an individualized program for each student.

In addition, ATP coordinates a four-week residential Summer Bridge Program for entering EOP/SAA freshmen. Students attend classes in mathematics, science, writing, and reading. A variety of cultural and personal development sessions are coordinated with these academic programs to orient students to college and provide a smooth transition from high school to UCSD.

OASIS Main Office, extension 43760  
Galbraith Hall, Room 1058

### **The B.C. (Before Calculus) Program**

The OASIS B.C. Program is designed to support students in their desire to excel in the pre-calculus sequence and to build a strong foundation for the calculus sequence. As a program participant, the student will be working and studying regularly with other students. The program offers pre-calculus workshops for Community College Math. 140 and Math. 4C as well as workshops in UCSD's Math. 1A-C.

OASIS Main Office, extension 43760  
Galbraith Hall, Room 1058

### **The Study Management Center**

The Study Management Center offers mini-courses, study skills workshops, and one-to-one conferences. The center offers GRE, MCAT, and LSAT Preparation Courses which provide test-taking practice and strategies. Study Skills Workshops are also scheduled throughout the quarter on such topics as time management, textbook reading, concentration, memory, and test preparation. Finally, students may enhance all of their skills through PAL (Personal Assis-

tance for Learning) conferences with a learning specialist. PAL conferences focus on the learning tasks, texts, and issues related to the student's specific course work. All of the workshop topics plus goal setting, procrastination, and stress management can be handled in these sessions.

OASIS Second Story, extension 47344  
York Hall, 4010

### **Research and Evaluation Program**

Administered jointly by the Office of the Assistant Vice Chancellor for Academic Services and OASIS, the Research and Evaluation program operates the OASIS Data Base.

Research projects examine a particular problem or issue related to OASIS services and have included studies of the relationship between high school quality and UCSD academic performance, the enrollment of women and minority students in majors requiring mathematics, the relationship between spatial and verbal aptitudes and self-instructional materials, and the effect of self-control techniques on test performance in calculus and chemistry. In addition, longitudinal studies of the effect of services on student users are undertaken, such as follow-up studies on the retention of Academic Success Program and Summer Bridge students.

Evaluation activities that are essential to the provision of effective services to students are also the responsibility of this program. All OASIS programs are evaluated each quarter, and results are used to make improvements in service for the following quarter as well as for long-range planning. Evaluation projects include study of the characteristics of students served, type of service provided, student opinion of services, and outcomes of service.

Research and evaluation reports are printed, bound, and distributed to interested persons or groups. These reports also provide much of the information necessary for various funding sources.

### **TEP 196—The Psychology of Teaching**

The director of OASIS teaches a four-unit, upper-division course that provides instruction to all OASIS student staff members—tutors, peer counselors, and study skills counselors—on the teaching-learning process. The course is designed to balance lectures and readings with supervised, practical experience.

OASIS Main Office, extension 43760  
Galbraith Hall, Room 1058



**OASIS Satellite Offices**

The Third Place provides services to all Third College and EOP/SAA students. Professional and peer counselors assist in all areas with adjustment to university life. In addition, there are tutors in writing, study skills, lower-division math, physics, chemistry, economics, biology, and computer science.

The Warren Academic Services Center, operated jointly with Warren College academic advising, offers tutoring and peer counseling, as well as selected workshops and study groups.

*The Third Place, extension 43284*

*102 Third College Commons*

*Warren Academic Services Center, extension 46030*

*Warren College Apartments Bldg. 2, Apt. 2110*

**Tutorial Programs**

OASIS provides free tutoring in lower-division biology, chemistry, physics, mathematics, economics, and computer science. Tutors are available on a drop-in basis to help the student become an independent learner. Most of the tutorial services are located in the Underground but are also available at the Third Place, the Warren Academic Services Center, and Muir Dorms. Tutors often arrange to hold group sessions in various locations throughout the campus. All tutors are required to complete TEP 196, The Psychology of Teaching, concurrent with their first quarter as tutors.

*The Underground, extension 42280*

*Galbraith Hall, Room 1254*

**Writing Center**

At the Writing Center students improve their writing skills and strategies for a range of different writing situations—the essay exam, the lab report, term and research papers—and across disciplines, from science to literature. One-to-one writing conferences are available by appointment for all UCSD students. These conferences stress prewriting preparation, revision, and editing strategies. Small group sessions address special needs, for example, research writing, editing, and writing English as a second language. The Grammar Moses telephone hotline offers phone-in service for help with diction, grammar, mechanics, and spelling.

*OASIS Writing Center, extension 42284*

*Student Center, Bldg. A, Room 214*



**The Language Program**

Students whose first language is not English are helped in the Language Program (LP). In addition, students doing academic, class related work in Spanish, French, Italian, and other foreign languages can participate in LP Workshops conducted by bilingual staff. The OASIS Language Program services include the Language Program Class, a biweekly intensive reading and writing class; weekly fifty-minute workshops on grammar and mechanics; weekly fifty-minute workshops in Spanish, French and other languages; practice of the English language for foreign students; and individual conferences where feedback on drafts of writing in the languages is provided.

*OASIS Language Program, extension 42284*

*Student Center Bldg. A, Room 214*

**The Scholars' Writing Workshop**

Students who are committed to achieving academic excellence as writers and who wish intensive, individualized help and group feedback on written assignments can participate in the Scholars' Writing Workshop. Services include weekly workshops and individual conferences.

*OASIS Second Story, extension 47344*

*York Hall, Room 4070*

**OFFICE OF INTERNATIONAL EDUCATION**

International Center

(corner of Hutchison Way and Gilman Drive)

Mail code 0018

534-3730

The International Center houses the offices of the foreign student and scholar advisers and advisers for the Education Abroad Program and the Opportunities Abroad Program, as well as the Programs Abroad Resource Library. In addition, the center has American English tutors available to foreign students, scholars and spouses, and houses the office of all the community volunteers who provide a wealth of hospitality programs to international students, scholars, and spouses, including language tutors and host families.

The staff and community volunteers as well as the International Club also sponsor a variety of international/intercultural programs and services for all members of the UCSD community. These include lectures, language exchanges, linkages with international faculty specialists, and weekly international cafe lunches which are open to the entire campus.



## **OPPORTUNITIES ABROAD PROGRAM (OAP)**

International Center (corner of Hutchison Way and Gilman Drive)  
Mail code 0018  
534-1123

The Opportunities Abroad Program (housed in the Programs Abroad Office, along with the Education Abroad Program) facilitates participation in programs abroad sponsored by institutions other than the University of California. OAP offers a resource library and advisory services enabling UCSD students to choose study, work, internship, and educational travel abroad programs best suited to their individual needs. Programs are available for students in all majors, for periods ranging from a quarter to a full academic year. Students participating in approved academic programs abroad transfer credit back to UCSD. They receive assistance with this as well as application, financial aid, predeparture and re-entry issues through the OAP. Students participating in nonacademic programs generally do not earn credit but in some instances may arrange to do so, for example, through the Academic Internship Program.

## **SAN DIEGO SUPERCOMPUTER CENTER**

SDSC Building  
Mail code 0505  
534-5000

In 1985, the National Science Foundation (NSF) selected UCSD as one of five sites for national supercomputer centers. SDSC has major funding from the NSF, the State of California, the University of California, and industrial partners. The NSF centers program was established to provide scientists and engineers with access to leading-edge computational capabilities, as well as provide education and training for students, researchers, and industry on how effectively to use supercomputers.

The state of California has provided \$6 million to establish a world-class Advanced Scientific Visualization Lab (Vis Lab), with the capability to apply state-of-the-art computer graphics to scientific visualization problems. Classes are being taught that use the state-of-the-art scientific visualization tools available at the Vis Lab.

The San Diego Supercomputer Center (SDSC), operated for UCSD by General



Atomics, is under the direction of Sidney Karin, with approximately eighty full-time staff. The center serves nearly 3,000 researchers and educators located at over 140 research institutions in forty-four states and the District of Columbia. Policy guidance is provided by a steering committee representing a consortium of twenty-five academic and research institutions, including UCSD and the other eight UC campuses.

### **RESEARCH AND DEVELOPMENT**

The computational research performed at SDSC spans many scientific disciplines, including biology and chemistry; math and computer science; a wide range of engineering disciplines; many branches of physics; and visualization.

The SDSC staff scientists welcome opportunities for collaborating with their colleagues in academia and industry. In addition, an SDSC fellowship program is open to graduate and undergraduate students, as well as post-doctoral research associates, faculty, and scientists from industrial and government laboratories.

### **COMPUTATIONAL FACILITIES**

Computing resources include a CRAY Y-MP8/864 supercomputer, one of the newest

generation supercomputers from Cray Research, Inc. The CRAY Y-MP computer runs the UNICOS operating system version of UNIX (adapted for Cray computers). Features include:

1. 6 nanosecond clock cycle.
2. 8 CPUs delivering about 56,000 CPU hours to users per year.
3. 512 million bytes of shared memory.
4. 1024 million bytes of solid state storage.
5. Powerful input/output subsystem with 100 megabyte/second channels.

SDSC and UCSD share a 64-node iPSC/860 parallel supercomputer from Intel Corporation. The Intel has 8 MBytes of memory per node and a peak speed of 5.1 Gflops (for 32-bit arithmetic). SDSC also has a 128-node nCUBE 2 parallel supercomputer with a peak speed of 420 Mflops for (32-bit arithmetic). Half of the nCUBE nodes have 16 MBytes of memory each, and the other nodes have 4 MBytes together totaling 1.25 GBytes of memory. The Intel is well suited to parallel problems that are essentially scalar.

### **SYSTEM SOFTWARE AND LANGUAGES**

A full set of UNICOS operating system functions and utilities are available for interactive and batch processing on the Y-MP. These utilities are based on both System V UNIX from AT&T with extensions from the Berkeley Software Distribution (BSD 4.2). Locally developed utilities include resource management and CPU quotas. SDSC has compilers for Fortran, Pascal, and C languages.

### **APPLICATIONS SOFTWARE**

SDSC has an extensive applications software collection to support numerous scientific disciplines—more than 100 packages and subpackages are supported by SDSC, and many have interfaces to improve their ease of use. New applications packages are evaluated and added to this collection regularly.

### **LONG-TERM FILE STORAGE**

The archival storage system at SDSC consists of a computer, communications, storage devices, and software that work together to provide 95 GBytes of disk space and over 2.5 TBytes of cartridge tape for long-term file storage. The computer is an Amdahl 5860; communications are over Network Systems FDDI and DX hardware; storage devices are 3380-technology disks and 3480-technology car-

tridge magnetic tape—manually and robot-mounted; IBM MVS is used for operating system and utility software; and DataTree, originally developed at Los Alamos National Laboratory as the common file system (CFS), is the storage system used at SDSC.

SDSC is pursuing several research activities in multiple instruction, multiple data (MIMD) parallel processing. With support from the UCSD computer science and engineering and physics departments, NSF, DARPA, DOE, nCUBE, and Intel, SDSC launched a MIMD parallel processing program in 1990. A multi-institutional committee provides policy guidelines for the program. SDSC staff have developed critical systems software and implemented several applications codes on the parallel computers. Allocations for grand challenge research and education and code development are available via the allocation procedure described below.

### ACCESS TO SDSC

SDSC is connected to the campus networks using the TCP/IP suite of protocols. As a result, UCSD researchers are able to collaborate with colleagues located at other locations via the TCP/IP-based Internet, which links major U.S. research institutions. Internet includes the NSFNET backbone with high-speed access between the NSF-funded supercomputer centers and the mid-level regional networks, e.g., CERFnet (California Education and Research Federation Network). Access is also available via DECnet, TYMNET, and direct dial telephone.

### ALLOCATION OF RESOURCES

SDSC allocates time in service units (SUs), each of which is equal to one CPU hour at nominal priority on the supercomputer of interest. For parallel execution the number of SUs is equal to the number of processors multiplied by the number of hours needed.

Allocations are made by a peer-review process of the research proposals. Proposals are judged on the following criteria:

1. Merit of the proposed research and its contribution to scientific knowledge.
2. Potential for successful completion of the research.
3. Appropriateness of the SDSC computer resources for the research.

In addition, UCSD has block grants from which SDSC resources are made available to

faculty and students. For more information, contact Donald W. Anderson, dean of Natural Sciences, or M. Lea Rudee, dean of Engineering.

### EXTENDED STUDIES AND PUBLIC SERVICE PROGRAMS

9600 North Torrey Pines Road  
(on the UCSD campus north of Muir College)  
Mail code 0176  
534-3400

The Division of Extended Studies and Public Service is an academic activity of the University of California which serves the educational needs and lifelong learning interests of adults in the San Diego community. The division provides advanced learning opportunities for educated and professional people, including courses, seminars, workshops, institutes, conferences, and study tours. Annual enrollment is approximately 35,000. With the exception of specific grant-funded programs, the division's programs are supported by course fees and receive no state funds.

UCSD Extension courses numbered 1 through 199 are structured in accordance with the requirements for regular campus courses and may be taken by UCSD students for elective credit.

For further information on the Division of Extended Studies and Public Service, phone 534-3400 for a free catalog. Among the many programs in the division are:

### CONTINUING PROFESSIONAL EDUCATION

Courses and certificate programs are offered in a wide range of fields, including microcomputer engineering, management, hazardous materials management, legal education, marketing communications, systems programming, personnel, real estate, emergency department nursing, alcohol studies, and fitness instruction. State-approved credential programs for educators, quarterly engineering colloquia, a career planning program, and course sequence awards in business, science, engineering, and computer science specializations are also offered.

### EXECUTIVE PROGRAMS

UCSD Extension offers a variety of programs to meet the needs of San Diego companies for astute, broadly educated managers equipped to deal with the dramatic financial,

technological, and cultural changes in today's workplace.

Two such programs include the "Executive Program for Scientists and Engineers" and the "Leadership and Management Program for Scientists and Engineers." Both are accelerated, proficiency-based courses of study tailored to the scientist or engineer who holds, or is about to be promoted to, a significant management position. Participants are nominated to apply for the programs by their companies. Both programs were developed by an advisory committee of San Diego engineering executives.

In addition, UCSD Extension sponsors major institutes and conferences featuring international experts designed to meet the needs of a national as well as local business constituency such as the annual "Securities Regulation Institute."

### ADVANCED TRAINING FOR EDUCATORS

State-approved credential programs for teachers offered by UCSD Extension include adult education, community college instruction, special education, and pupil personnel services, to name just a few. There are two certificate programs in computers in education, plus a wide range of seminars and workshops in innovative teaching techniques and educational administration.

In addition, summer institutes for teachers allow the university to contribute to the education of our community's young people by enhancing the intellectual perspective of teachers. For example, the Program for Teacher Enhancement in Science and Technology (PTEST), funded by NSF, and Project COPE (Change on Planet Earth), co-sponsored with Scripps Institution of Oceanography, bring selected teachers to the campus for seminars and courses taught by prominent UCSD faculty.

### CONNECT: THE PROGRAM IN TECHNOLOGY AND ENTREPRENEURSHIP

Formed in the fall of 1985, CONNECT is designed to contribute to the realization of San Diego's high-technology potential. The program provides a context in which the leaders of high-tech businesses and service industries can exchange information, generate ideas, and develop resources. Among its many activities—including research, publications, forums that bring together the financial and technological communities, and contributions

to the future expansion of high technology in San Diego—the program presents educational events designed to fulfill such objectives as helping researchers and entrepreneurs identify the commercial potential of their ideas and findings; creating opportunities for researchers to showcase their ideas to potential investors and venture capitalists; helping entrepreneurs improve their business planning, management, and financial skills; and creating a context for analysis and discussion of the critical public policy issues that affect the growth of high-tech enterprises. For further information, phone the program director, 534-6114.

### **LIFELONG LEARNING OPPORTUNITIES**

People who enjoy reading, thinking and talking about ideas, exploring the philosophies of other cultures and other times, or exercising their creative talents have a special resource in UCSD Extension. People interested in keeping current on changing trends and public issues can also turn to UCSD Extension for in-depth analyses and discourse. Courses and workshops are offered in painting, music, acting, literature, history, oceanography, political science, health, foreign languages, to name just a few. A variety of free public lectures, community forums, and public policy seminars are also available from the campus under the auspices of Extended Studies.

### **INTERNATIONAL STUDIES AND LANGUAGE PROGRAMS**

UCSD Extension offers a variety of English programs for individuals for whom English is not the native language. The Intensive English Language Program is taught at six academic levels with electives such as advanced grammar, TOEFL preparation, American history, and business and scientific English. It is offered throughout the year at ten-week intervals. In addition, short courses in conversation are offered during the winter and summer (and at other times by special contract) for international visitors and students who wish to improve their ability to understand and communicate in English.

In addition, an innovative series of courses in English for Bilingual Professionals, leading to a certificate, offers bilingual managers, business owners, and professionals a means to advancement in our English-oriented society.

A wide variety of language programs for English speakers such as Spanish and Korean are offered year-round.

### **HEALTH MANAGEMENT**

In the 1990s, health will be a critical issue, from the economic and sociological as well as medical perspectives. UCSD Extension offers advanced and continuing education courses for health professionals, and a beginning and advanced Certificate Program in Fitness Instruction/Health Management.

In addition the Program on Alcohol Issues is designed to contribute to a broader public understanding of alcohol problems and the avoidance of their adverse consequences. Program offerings include national conferences, professional development courses, and the annual Summer School of Alcohol and Other Drug Studies.

### **LEGAL ASSISTANT TRAINING PROGRAM**

Both daytime and evening programs are offered through UCSD Extension to provide the education and skills needed to perform the tasks of the legal assistant who works as a member of the legal team in law firms, corporations, governmental agencies, and other organizations. Both programs have been approved by the American Bar Association.

### **CONCURRENT REGISTRATION**

Concurrent Registration is a procedure which allows individuals who are not officially matriculated UCSD students to participate for

credit in regular UCSD courses. Enrollment is on a space-available basis with the approval of the course instructors. Individuals must register through UCSD Extension. Information on this program can be obtained through the UCSD Extension Registration Office.

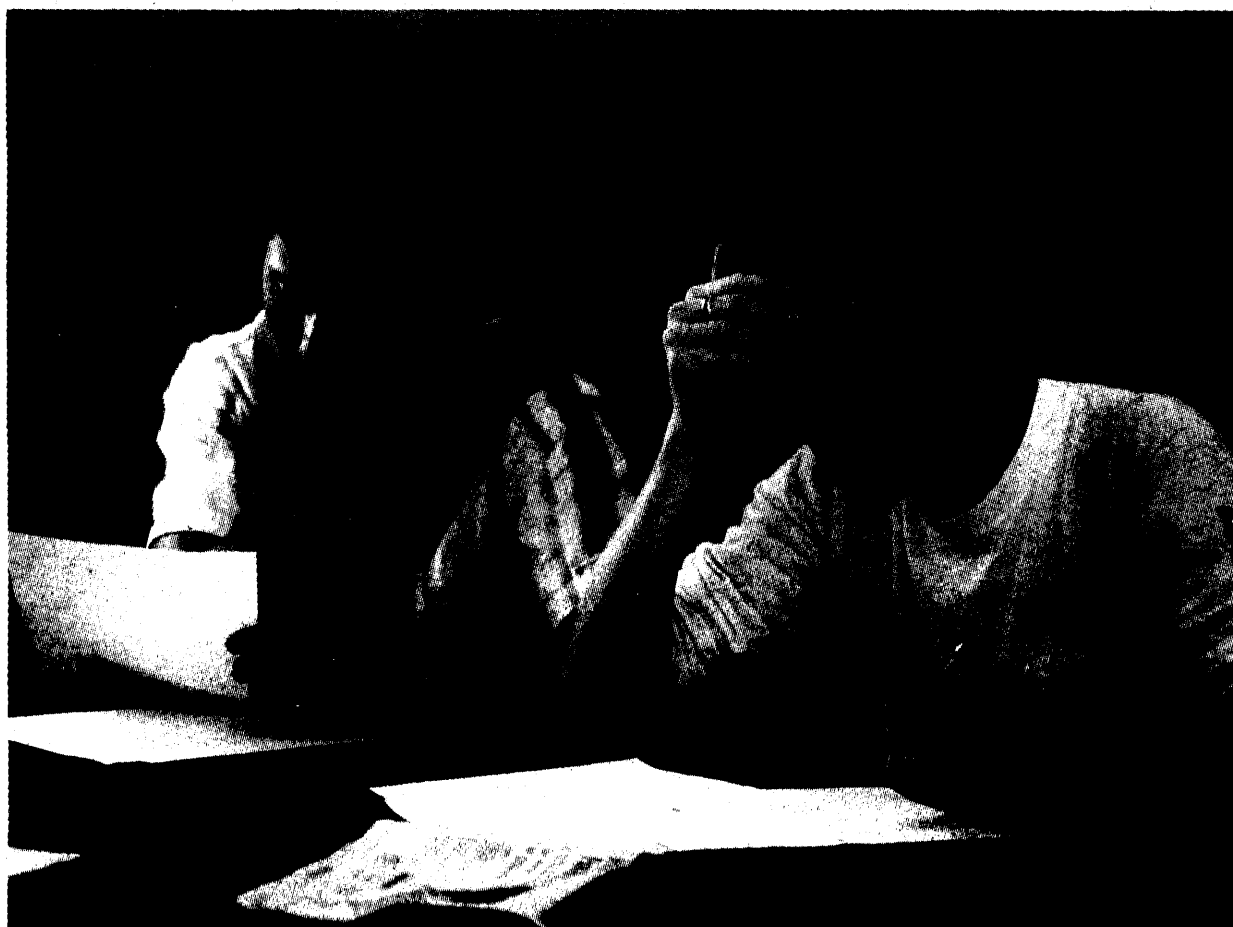
A reciprocal arrangement allows matriculated UCSD students to enroll in UCSD Extension courses free of charge. Undergraduates at UCSD interested in this program should call their provost's office for information; graduate students should contact the Office of Graduate Studies and Research.

### **PROGRAMS FOR RETIRED PERSONS: INSTITUTE FOR CONTINUED LEARNING**

The institute is an organization for retired persons conceived, developed, and directed by retirees themselves. ICL has an active learning and social program created by members, including seminars, study groups, classes, forums, trips, and luncheons. Approximately 350 members participate in ICL activities. Information is available by calling 534-3409.

### **THE UNIVERSITY LIBRARY**

The UCSD library consists of the Central University Library, the Science and Engineering Library, the Biomedical Library and Medical Center Library, the Scripps Institution of Oceanography Library, the International Rela-



tions and Pacific Studies Library, the Undergraduate Library, and the Slide Collection.

**COMBINED UCSD LIBRARY STATISTICS, 1991**

Volumes .....	2,055,113
Periodical and other serial publications received .....	23,784
Government documents .....	321,580
Maps .....	266,937
Microforms .....	2,074,212
Audio and video materials .....	60,821
Slides and other pictorial items .....	226,196

The library is a center for study, reading, and scholarship at UCSD. Its collections and services are basic resources supporting undergraduate and graduate instructional programs, as well as advanced research. The library units are organized and staffed to meet these academic objectives. While each library may have varying rules, all are open to all members of the UCSD community.

Reference services are available at each of the campus libraries and are designed to assist students and faculty with their course needs and research activities. Through its Instructional Services Program, the library offers campus users a variety of orientation and instructional opportunities. The Contemporary Issues 50 course (Information and Academic Libraries) of Muir College is one example. Individual and group tours of the libraries can be arranged through the reference librarians.

The Interlibrary Loan Service locates and borrows materials not held at UCSD. This service is available to all faculty, staff, and students of the university. Our students enjoy direct borrowing privileges at the other UC campuses. A small jitney bus that transports library materials daily to and from the UCLA library is available to members of the UCSD community as space allows.

The Computer Assisted Reference Service assists readers in the compilation of subject bibliographies. This process not only saves readers the time of manually searching periodical abstracts and indexes, but also permits more thorough searching of data bases like Biological Abstracts, ERIC, Medline, and Psychological Abstracts. Contact the reference departments of the Central University Library or any science library for information about this service.

Library hours of service vary and are regularly posted. Most units extend hours during examination periods.

NOTE: Call 534-3837 for an up-to-date schedule of open hours for all libraries (recorded message).

**CENTRAL UNIVERSITY LIBRARY**

(located north of the Matthews Administrative and Academic Complex and east of Third College)

Mail code 0175R  
534-3336

The Central University Library houses the research collections in the social sciences, humanities, and fine arts (1,333,112 vols.). Its Research Services contains an outstanding collection of bibliographies, indexes, encyclopedias, biographical directories, and other information resources. The Documents Collection is a depository for the official publications of California, the United States, the United Kingdom and the United Nations, and also contains a major topographical and political map collection. A listening facility in the Music Collection serves music instruction and research. The Mandeville Department of Special Collections includes rare books, manuscripts, and other research materials. Special Collections' resources include materials about Baja California, Pacific Voyages, the Spanish Civil War, science and public policy, and modern poetry.

**SCIENCE AND ENGINEERING LIBRARY**

Urey Hall, Revelle College  
Mail code 0175E  
534-3258

The Science and Engineering Library contains strong collections in the physical sciences and technology (179,131 vols.). Of particular importance are its research materials in chemistry, computer science, electronics, engineering, mathematics, physics, space sciences, and nuclear energy.

**BIOMEDICAL LIBRARY**

Basic Science Building, School of Medicine  
Mail code 0175B  
534-3255

The Biomedical Library contains collections in biology and medicine which are especially rich in the journal literature of the basic sciences and clinical medicine, with emphasis on cellular and molecular biology, neurosciences,

and genetics (183,178 vols.). A branch library, the Medical Center Library (25,476 vols.), supports the activities of health care providers at the UCSD Medical Center in the Hillcrest area of San Diego. Mail code 8828, 543-6520.

**INTERNATIONAL RELATIONS AND PACIFIC STUDIES**

Mail code 0175W  
534-7785

The IR/PS Library features materials on contemporary political, economic, and business affairs in East Asia, Latin America, and the rest of the Pacific Basin region (29,005 vols.).

**SCRIPPS INSTITUTION OF OCEANOGRAPHY LIBRARY**

Mail code 0175C  
534-3274

Scripps Institution of Oceanography Library is the largest marine science library in the world (222,142 vols.). It has outstanding collections in marine biology, oceanography, and marine technology, and also specializes in geology, geophysics, and zoology.

**UNDERGRADUATE LIBRARY**

Galbraith Hall  
Revelle College  
Mail code 0175D  
534-3065

Undergraduate Library has a general collection (83,069 vols.) and provides reference and instruction services especially designed to meet the needs of lower-division undergraduates. UGL's Playback Center houses a permanent audiovisual collection (2,256 audio; 835 video) and reserve materials used by faculty in their classes.

**THE SLIDE COLLECTION**

Mandeville Center  
Mail code 0175F  
534-4811

This collection has been developed to provide visual materials for on-campus instructional purposes. It includes over 188,700 slides covering all periods of art history in architecture, sculpture, painting, and the minor arts, as well as other subjects in the arts, humanities, social sciences, and sciences.



## STUDENT SERVICES AND PROGRAMS

### VICE CHANCELLOR, STUDENT AFFAIRS

Building 112 Matthews Administrative and Academic Complex  
Mail code 0015  
534-4370

The Office of the Vice Chancellor of Student Affairs is responsible for the overall quality of life at UCSD for undergraduate and graduate students. The office provides coordination and direction to more than two dozen student service departments and works closely with other components of the campus to ensure that programs, services, policies, and procedures foster the development of students and the achievement of their academic and career goals.

### CAREER SERVICES CENTER

Mail Code 0330  
534-3750

#### PURPOSE AND OBJECTIVES

The Career Services Center exists to help UCSD students and alumni determine and fulfill their career goals. Thus, it offers a wide range of services related to employment and graduate education. Although sometimes overlapping, these services are divided into the following three program areas:

1. **Part-time Employment**—programs which help students obtain part-time, temporary, and summer employment;
2. **Career Advising**—programs which help students identify and pursue career goals;
3. **Professional/Graduate School Advising**—programs which help students identify and seek admission to professional/graduate schools.

#### SERVICES AND PROGRAMS

Career Services Center programs are provided in a variety of forms including drop-in advising, individual appointments, workshops, special events, and informational resources. Examples of services in each of the three program areas are outlined below:

##### 1. Part-time Employment

- a. *Job Listings*—On- and off-campus job vacancies

- b. *Student Corps Services*—Temporary on-campus employment through campus departments

- c. *Co-ops/Internships*—Paid, pre-professional employment experiences

- d. *Special Assistance*—Individual help in finding desirable part-time employment

##### 2. Career Advising

- a. *Career Planning*—Career decision-making workshops, SIGI (computerized planning tool), panel presentations, career fair, career survey, career consultants

- b. *Job Search Preparation*—résumé writing, interviewing, and job search strategy workshops. Video-taped mock interviews

- c. *Job Seeking*—On-campus interviews, job search clubs, listings, MENTOR, job fairs

- d. *Special Assistance*—Individual assistance with career concerns and informational resources related to occupational research and employer identification

##### 3. Professional/Graduate Advising

- a. *Decision Making*—Directories, special events, fairs, catalogs

- b. *Admissions Preparations*—Applications for admissions tests, personal statement assistance, interview preparation

- c. *Reference Files*—method to collect and distribute letters of recommendation

- d. *Special Assistance*—Individual assistance with career concerns related to professional and graduate school admissions

Details about these programs are available at the Career Services Center.

### COLLEGE DEANS' OFFICES

Revelle, Mail code 0321, 534-3492  
Muir, Mail code 0106, 534-3587  
Third, Mail code 0509, 534-4390  
Warren, Mail code 0022, 534-4731  
Fifth, Mail code 0069, 534-2237

The staffs of the college deans' offices perform many different functions. They provide help, advice, counseling, and referral in many areas. The deans' offices regularly design and coordinate activities such as orientation, Welcome Week, commencement, decisions about remaining in or withdrawing from school, counseling on legal problems, involvement in student governments, planning social and educational activities, handling housing concerns, assisting with specialized concerns for

physically limited students, and assisting in hearing procedures regarding grievances.

Contact your college dean's office for assistance, particularly if you do not know which university office or resource would best be able to aid you with your problem or concern.

### DISABLED STUDENT SERVICES

Building 204 Matthews Administrative and Academic Complex  
Mail code 0019  
534-4382/534-2494 (TDD)\*  
\*(Telephone for the deaf ONLY)

See "Student Affairs/Special Services Center" later in this section.

### FINANCIAL AID

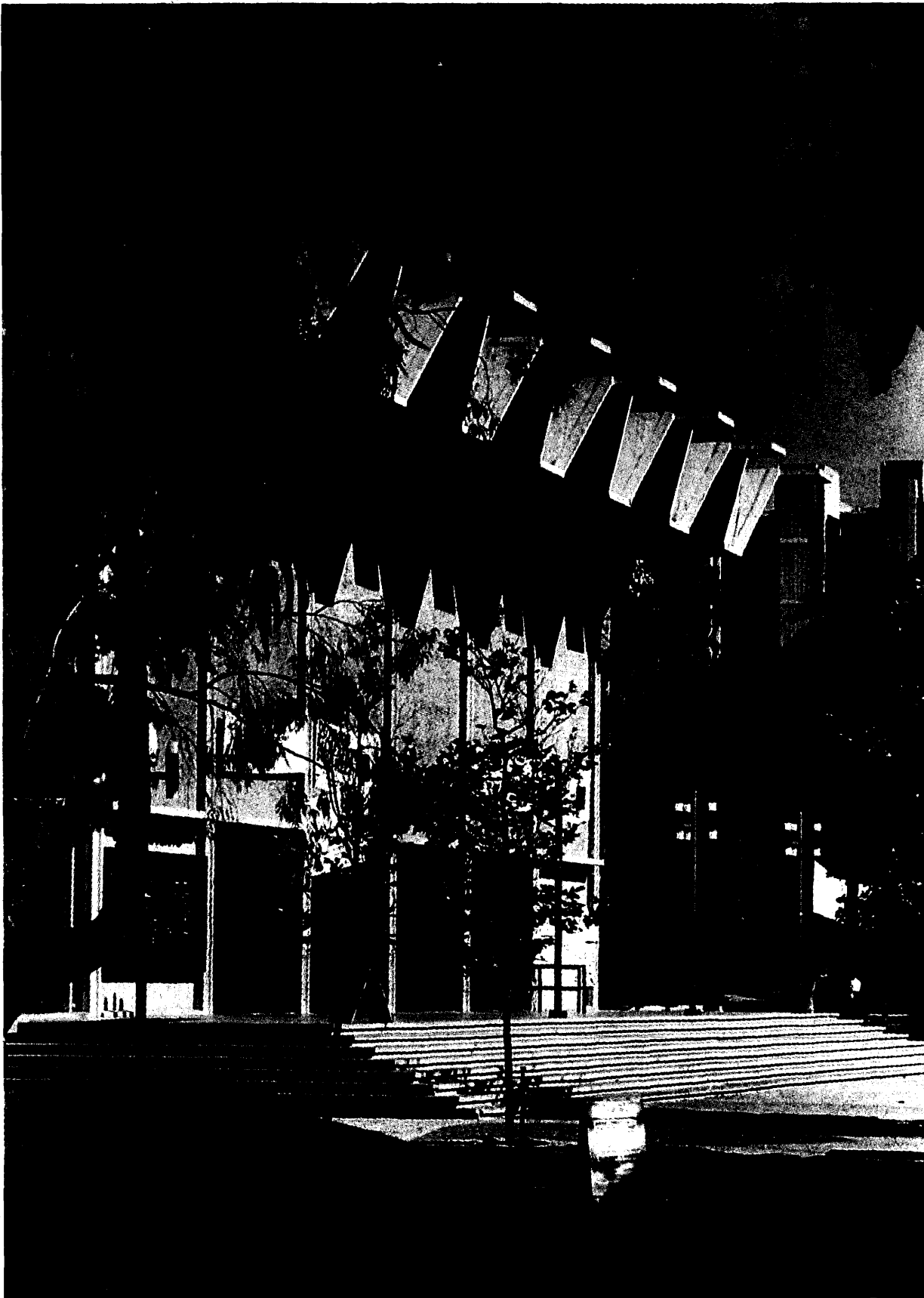
#### STUDENT FINANCIAL SERVICES

All financial assistance for undergraduate and medical students and need-based aid for graduate students is administered by the Student Financial Services Office. Information relating to graduate student support in the form of fellowships and assistantships is presented in the section entitled "Graduate Studies."

The University of California, San Diego expects students and their families to bear as much of the basic, necessary costs of the student's education as their circumstances will allow. In those cases where family resources are insufficient to meet the basic educational costs, the Student Financial Services Office will attempt to assist students in obtaining supplemental support and financial aid. Students who are nonresidents of California should note that financial aid funds are not sufficient to meet the additional cost of non-resident tuition (\$7,699 during 1991-92). The family should be prepared to provide this amount from its own personal resources.

The Student Financial Services Office is divided into six separate financial aid offices—one for each of the undergraduate colleges and one for the graduate division. (The School of Medicine financial aid office is housed in the medical school.) The Student Financial Services Office also includes the scholarship office and the office of veterans' affairs. The purpose of this structure is to serve more efficiently the needs of the students who re-





quire financial assistance, scholarship information, and veterans' benefits certification services while attending UCSD. Locations and telephone numbers are listed below.

Fifth College, 204 Matthews Administrative and Academic Complex (619) 534-2550

Muir College, 210 Matthews Administrative and Academic Complex 534-3808

Revelle College, 213 Matthews Administrative and Academic Complex (north entrance) 534-3806

Third College, 213 Matthews Administrative and Academic Complex (south entrance) 534-3805

Warren College, 214 Matthews Administrative and Academic Complex (west entrance) 534-4686

Graduate Division, 204 Matthews Administrative and Academic Complex 534-3807

Scholarship Office, 214 Matthews Administrative and Academic Complex 534-3263

School of Medicine, Medical Teaching Facility 534-4665

Veterans Affairs, 210 Matthews Administrative and Academic Complex 534-4483

Applications and requests for information should be addressed to the appropriate area of the Student Financial Services Office as follows: University of California, San Diego, Attn: (your undergraduate college name or graduate division), Student Financial Services, 0013, 9500 Gilman Drive, La Jolla, California 92093-0013.

No student should leave the university for financial reasons before exploring all possible avenues of assistance with a Student Financial Services counselor. Financial assistance, undergraduate scholarships, loans, grants, and work-study employment, unless otherwise designated, are processed by the Student Financial Services Office. Several publications are available on request from the Student Financial Services Office describing in detail the various financial aid programs and services administered by this office. *All information contained herein is intended to serve as a general guide and is subject to change in conformity with new and revised federal, state, and University of California regulations.*

### **Undergraduate Scholarships and Fellowships**

The purpose of the Undergraduate Scholarship Program at UCSD is to encourage academic excellence and to recognize outstanding achievement. Scholarships are awarded to entering and continuing students on a competitive basis. Consideration is given to demonstrated academic ability as evidenced in GPA, math and verbal SAT scores, Achievement Test scores, honors courses, additional a-f courses taken beyond the requirement, scholastic promise, and, in many instances, financial need. Honorary scholarships awarded solely on the basis of academic excellence are Regents Scholarships, Revelle Scholarships, Alumni Scholarships, as well as various other academic achievement scholarships. Several restricted scholarships may also be awarded as honorary. UCSD participates in the National Merit Scholarship Program and awarded \$166,883 to 185 recipients in 1991-92. Students must reapply for undergraduate scholarships each academic year, with the exception of the Regents and the Revelle Scholarships,



which are awarded for a two- or four-year term. The Committee on Undergraduate Scholarships and Honors, which is composed of UCSD faculty members, selects the recipients. Notification of Regents awards and non-need-based scholarship awards (honorary scholarships) starts in March. Notification of need-based awards is made in the Financial Aid Award Letter, which will be mailed beginning in May 1992. Restricted scholars are not notified until September or later. For all scholarships, letters are mailed only to those students selected. We regret we are unable to mail denial notification to other applicants.

Students entering UCSD from high school or another postsecondary institution must complete Section X on the *University of California 1992-93 Undergraduate Application for Admission and Scholarships*. The deadline for submission of the application is November 30, 1991. No supporting documents are required.

Student Financial Services (SFS) will mail 1992-93 scholarship applications to all highly qualified students. Those who wish to apply for scholarships, but did not receive an application in the mail, should obtain one from SFS. The deadline for submission of the scholarship application is January 31, 1992.

Current UCSD Early Admissions Honors (EAH) students will be mailed a scholarship application. It should be returned directly to the EAH Coordinator (0337, UCSD) by the January 31, 1992, deadline.

If you plan to file the *University of California 1992-93 Application for Admission* winter or spring quarter and wish to be considered for 1993 UCSD scholarships, you must request a scholarship packet from the Student Financial Services Office in December 1991. The deadline for submission of the scholarship application is January 31, 1992.

### **Regents Scholarships**

The Regents of the University of California annually provide each campus with Regents Scholarships, which are considered to be the most prestigious of university awards. Recipients are selected on the basis of academic excellence and exceptional promise. The Committee on Undergraduate Scholarships and Honors, composed of UCSD faculty members, selects the entering recipients with emphasis on the following criteria: GPA (capped at 4.00), math and verbal SAT scores, Achievement Test scores, honors courses, and additional a-f courses taken beyond the require-

ment. The actual GPAs of entering students selected as Regents Scholars in 1991-92 ranged from 3.76 to 4.91 with a mean of 4.32, while the median of the combined SAT scores totaled 1410. Continuing students who were offered the Regents Scholarship averaged a 3.94 UC GPA in 1991-92. This scholarship is awarded to students beginning their freshman or junior years, for a term of four or two years, respectively. Renewal of the scholarship is automatic, provided the student maintains at least a 3.0 cumulative UC GPA and completes thirty-six units annually at UCSD.

The dollar amount of each Regents Scholarship is based on the student's financial need, which is reassessed each year. Regents Scholars who do not submit financial data or who are determined not to have financial need, receive a \$500 honorarium during each year of appointment. Additionally, in the initial year of appointment only, entering 1991-92 Regents Scholars were considered for a second one-year scholarship based on their academic achievement. Foreign students, as sophomores, are eligible to apply for the Regents Honorarium Scholarship for appointments beginning in the junior year. Regents scholars who demonstrate financial need receive a stipend to cover the difference between their family and outside resources and the yearly cost of attending UCSD. This basic cost is established each year by the Student Financial Services Office and includes required fees and tuition, books and supplies, room and board, personal and transportation expenses. During 1991-92, the awards ranged from \$500 to \$16,759.

Regents and National Merit Scholars are also eligible for certain privileges and recognitions such as preferred class enrollment, guaranteed on-campus housing for four years (provided housing deadlines are met), UCSD college of choice at time of admission (Regents only), graduate student library privileges, honors seminars transcript annotation (Regents only), reception with the chancellor, and expanded computer accounts.

### **The Ellen and Roger Revelle Scholarship**

This prestigious scholarship recognizes two outstanding undergraduate students entering UCSD each fall. The scholars are chosen on the basis of academic excellence and exceptional promise. Each award grants a \$1,500 annual honorarium for up to four years.

### **University Scholarships**

The University of California has provided this scholarship fund to assist outstanding needy students meet the cost of attending UCSD. Selection is based on academic record, promise, and financial need. Awards may range up to \$2,000 per academic year.

### **Transfer Admission Guarantee (TAG) Scholarship**

This scholarship is awarded to students transferring to UCSD through the TAG program from each one of the nine local community colleges in San Diego and Imperial Counties. It is a two-year honorary award of \$500 annually. Renewal of the scholarship is automatic, provided the student maintains a 2.00 cumulative UC GPA and completes thirty-six units annually at UCSD.

### **Alumni Scholarships**

The UCSD Alumni Association provides one-year scholarships to recognize outstanding students and to assist with the cost of attending UCSD. These awards are based on academic and personal achievement, and future promise. Alumni awards do not consider financial need, as they are honorary scholarships. For the 1991-92 academic year, the recipients received scholarships for the full cost of California resident UC registration fees.

### **Scholarships for National Merit Finalists**

UCSD offers college-sponsored scholarships to some National Merit finalists who attend UCSD and whose National Merit awards are not funded by corporate donors. Annual awards range from a \$500 honorarium to a \$2,000 need-based stipend. Additionally, in the initial year of appointment only, entering corporate-sponsored 1991-92 National Merit scholars were considered for a second scholarship based on their academic achievement. Refer to the "Regents Scholarships" section for a listing of the UCSD privileges accorded National Merit winners.

### **Various Academic Achievement Scholarships**

Provost Honors scholarships have been offered to students entering UCSD with a minimum GPA of 3.80 and SAT math and verbal scores of 650 each. New criteria may be established for the 1992-93 academic year.

**President's Undergraduate Fellowship Program (PUF)**

This program helps unusually talented undergraduate students pursue special studies and projects, under faculty supervision, during term time and/or vacations. Projects may include research and/or other creative activities. Winners are awarded a need-based stipend, determined by the cost of the project.

**David Jay Gambee Memorial Fellowship**

This memorial fellowship has been established from funds donated in memory of David Jay Gambee, a former UCSD Revelle College student. Similar to the President's Undergraduate Fellowship Program, this fellowship helps assist undergraduate students to pursue special studies and projects in the areas of university governance, ecological values clarification, encourages volunteer services in the community, or participation in programs related to the Institute on Global Conflict and Cooperation. Research is conducted under faculty supervision during the academic year and/or vacation periods. Winners are awarded a need-based stipend, determined by the cost of the project.

**APPLYING FOR STUDENT FINANCIAL ASSISTANCE**

UCSD students must meet the following criteria to be eligible for financial assistance:

1. Be a United States citizen or eligible non-citizen.
2. Be enrolled in good standing in a program leading to a degree or certificate and maintain satisfactory academic progress as defined for UCSD financial aid recipients. Please refer to the *Financial Aid Consumer Handbook* for specific information.
3. Not be in default on any Perkins Loan (formerly National Direct Student Loan), Stafford Loan (formerly Guaranteed Student Loan), PLUS Loan, or Supplemental Loan received at any institution.
4. Not owe a refund on any Title IV grants received at any institution.
5. Be registered with Selective Service if you are a male who is at least eighteen years old and born after December 31, 1959, unless you are not required to be registered.

For evaluation of financial need, all applicants must submit a Student Aid Application

for California (SAAC), and, if required, copies of the 1991 federal income tax returns with a UCSD Income Tax Certification form, and any other required documents. For specific instructions, refer to the *Financial Aid Consumer Handbook*, which is available upon request. The SAAC form should be filed by March 2, 1992, the UCSD priority filing date, with the appropriate processing agency and must indicate the University of California, San Diego to receive a processed copy of the SAAC.

**RECEIVING FINANCIAL ASSISTANCE**

UC financial assistance is funded by a combination, or "package," of grant and self-help aid. Grants and scholarships are awards that do not have to be repaid. Self-help aid may consist of a loan, which does have to be repaid, or a work-study award, earned by working at a part-time job while attending school, or a combination of both. UCSD uses an equity packaging formula which ensures that students in similar circumstances all receive the same percentage of "gift" aid and the same percentage of "self-help" aid.

**PELL GRANT (APPLY USING THE SAAC)**

Pell Grant is a federal aid program designed to provide financial assistance to undergraduates attending post-high-school educational institutions. Pell Grants are intended to be a "foundation" of an undergraduate financial aid package and may be combined with other forms of aid in order to meet the student's educational costs. To apply for a Pell Grant, you must check the appropriate box on the SAAC in addition to requesting UCSD to be sent a copy of your SAAC.

**UNIVERSITY OF CALIFORNIA GRANT PROGRAM**

The University of California Grant-In-Aid Program provides nonrepayable grants to students who demonstrate financial need. The Opportunity Grant is a state-funded grant awarded to undergraduate students who have demonstrated financial need.

**SUPPLEMENTAL EDUCATIONAL OPPORTUNITY GRANT (SEOG)**

SEOG awards are federally funded and are granted only to undergraduate students demonstrating financial need. Awards may range from \$100 to \$4,000 per academic year.

**CAL GRANTS (UNDERGRADUATE)**

Cal Grants are awarded by the California Student Aid Commission to undergraduate California residents. Current recipients must reapply each year to have their award renewed. All applicants for UCSD aid are required to apply for a Cal Grant by March 2, 1991, using the SAAC; UCSD will be unable to fund the amount of a full Cal Grant fee award (\$2,463 during 1991-92) for students who do not receive this grant.

**CALIFORNIA STATE GRADUATE FELLOWSHIP**

California State Graduate Fellowships are awarded by the California Student Aid Commission to California residents entering their first or second year of graduate or professional study. This fellowship assists eligible students with registration fees and is awarded to disadvantaged, academically proficient students who can demonstrate financial need and intend to pursue an academic career at the collegiate or university level. Current recipients must reapply each year to have the award renewed. A SAAC must be filed by the preceding March 2.

**WORK-STUDY**

Federal and state work-study programs are employment programs that provide funds for student employment by the university or by public and private profit/nonprofit organizations. Students with demonstrated financial need will be considered. The work-study program provides experience in many fields, including experimental sciences, library work, recreation, computer sciences, peer counseling, and office work. Pay ranges from minimum wage and above. Job listings and referrals are provided through the Career Services Center.

**PERKINS LOANS (FORMERLY CALLED NATIONAL DIRECT STUDENT LOANS)**

A student is eligible for a Perkins Loan if he or she demonstrates financial need. An undergraduate student may borrow up to \$4,500 during the first two academic years. The aggregate sum for all undergraduate studies may not exceed \$9,000. A graduate or professional student may borrow up to a \$18,000 maximum, including the amount borrowed as an undergraduate, for his or her total academic career. Students under eighteen years of age

are required to obtain a co-signer. For new borrowers, repayments and interest (currently 5 percent) begin nine months after ceasing to be enrolled at least half-time.

### UNIVERSITY LOANS

University Loans are also available. The eligibility requirements and terms, except for differences in cancellation provisions, are generally the same as for the Perkins Loans. A co-signer is required for this loan.

### STAFFORD LOANS (FORMERLY GUARANTEED STUDENT LOANS)

These loans are available to students who demonstrate financial need. The annual maximum allowed during the first two years of undergraduate study is \$2,625, and \$4,000 per year for the remaining years of undergraduate study, with an undergraduate cumulative maximum of \$17,250. Graduate students may borrow up to \$7,500 per academic year with an aggregate sum of up to \$54,750, including the amount borrowed as an undergraduate. The interest rate for new borrowers is 8 percent through the in-school period and for the first four years of repayment, increasing to 10 percent at the start of the fifth year of repayment.

Repayment begins six months after the borrower leaves school or ceases to be enrolled as a half-time student.

Stafford Loan applications are mailed to students who have filed a SAAC, have completed the UCSD financial aid application process, and have been determined to have loan eligibility based on financial need.

### SUPPLEMENTAL LOANS FOR STUDENTS AND LOANS FOR PARENTS

Independent undergraduates, graduate students, and parents of dependent undergraduates or dependent graduate students are eligible to borrow under this program. The interest rate for this loan is variable, established each July 1 for the following academic year (for 1991-92 the interest rate was set at 9.34 percent). Parents of dependent undergraduates or dependent graduate students are eligible to borrow up to \$4,000 per year (with a cumulative maximum of \$20,000) under this program. Independent undergraduates and graduate students are eligible to borrow up to \$4,000 per year maximum (with a cumulative maximum of \$20,000). The first payment is due within sixty days of the date the loan is disbursed. In-school deferments of principal

and interest payments are available for students, and parent borrowers may also defer payments for unemployment, in-school status, and temporary disability. Deferred interest will be capitalized on a minimum quarterly basis. Student borrowers must file a SAAC and complete the UCSD financial aid application process for eligibility to be determined. Applications and further information may be obtained from the Student Financial Services Office after July 1 for the following academic year.

### EMERGENCY SHORT-TERM LOANS

These limited student emergency loan funds, made possible by gifts to the university, are granted in small amounts to help non-financial aid students in critical short-term emergencies, and usually must be repaid within thirty days. There currently is a service charge of \$20 per emergency loan, and students must be enrolled in at least six units. Applications and further information are available in the Student Financial Services Office.

### FINANCIAL ASSISTANCE, GRADUATE

See section entitled "Graduate Studies" for additional types of financial assistance available to graduate students.

### FOOD SERVICES

Administration: Muir Commons Annex  
Mail Code 0122  
534-4013

A wide variety of foods in various distinctive settings is available on campus. Cafeterias and restaurants are conveniently located close to the residence halls throughout campus. Additionally, there are restaurants located adjacent to the School of Medicine, Third College, Revelle College, Muir College, and Scripps Institution of Oceanography. Students and the public may eat at any of these facilities, and hours will vary depending on locations.

For students living in the residence halls, a board plan is mandatory; it is optional for apartment residents. Residence hall students may choose among six different board plans. For the cost of these plans, please refer to the "Housing" section below.

Campus food services also offer several meal plans to commuters and apartment residents on a quarterly basis, at a cost based on the board rate. Some apartment residents prefer to do their own cooking; those choosing a board plan usually select one of the Dining

Plus board plans or a Dining Plus cash account.

Resident students will use their campus I.D. card for meal plan identification, entitling them to eat in any of the full-service cafeterias or many restaurants located around campus. Each restaurant has its own unique atmosphere, and menu items differ from one location to another.

Other food service facilities include six fast-food restaurants and a convenience store located in the Price Center, the Food Co-op., located in the Student Center; and the Ché Cafe located on Revelle campus. Also available for a limited selection of food stuffs are portable food carts, and a variety of vending machines located in key traffic locations throughout all the campuses.

### HOUSING

#### ON-CAMPUS HOUSING

Administration:  
Building 514 Matthews Administrative and Academic Complex  
Mail code 0041  
534-4010

#### SINGLE UNDERGRADUATE HOUSING

Revelle, John Muir, Third, and Fifth Colleges have residence hall accommodations. Residence halls are arranged around a suite plan with students sharing a common living-study area. Most of the rooms are designed for double occupancy. The limited single rooms are usually reserved by returning students. The residence hall contract provides for a mandatory board plan. The estimated cost for room and board is approximately \$5,900 plus a \$75 deposit for the 1992-93 school year (fall-winter-spring quarters) and will vary depending upon payment and meal plans chosen and type of room accommodation.

Single and double rooms in apartments at John Muir, Third, and Fifth Colleges are available. UCSD also offers two-bedroom apartments for four single undergraduate students of Third College, Warren College, and Revelle College. A board plan is available for all apartment dwellers on an optional basis.

A housing brochure with an application for on-campus housing is sent, beginning in February, to all who have indicated their interest in on-campus housing on their application for admission. Students must return the housing application with a \$20 nonrefundable applica-





tion fee to the Housing Administration office and file a Statement of Intent to Register form with the Admissions Office to be eligible for housing. Contracts are issued in batches based on a priority system and as space permits beginning in June and about every four weeks thereafter throughout the summer. The priority system is explained in detail in the housing brochure.

The housing application deadline for guaranteed housing for fall 1992-93 was May 6, 1992, for new freshmen and transfers. However, applications are still being accepted. Students guaranteed housing are accommodated first. First-time freshmen living more than a fifteen-mile radius from campus (determined by zip code) have priority for new student space in the residence halls and some single undergraduate apartments on a space available basis.

The Housing Administration Office recommends that students who are still on the waiting list telephone the office in early August for further information.

The resident dean of the applicable college assigns rooms in the residence halls or spaces in the apartments. The Housing and Dining Services Administration Office, located in Building 514 Matthews Administrative and Academic Complex, administers housing contracts and handles other details related to housing contracts.

Housing for married students and single graduate students is available in studio, one-, two-, and three-bedroom apartments in the Coast, Mesa, and La Jolla Del Sol complexes.

### **MARRIED AND SINGLE GRADUATE HOUSING**

The Residential Apartments and La Jolla Del Sol are the two housing facilities available to married and single graduate students. The Residential Apartments are older-style studio, one-, two-, and three-bedroom units. All are unfurnished except for stoves, refrigerators, and living-room drapes. Some of the units are carpeted and some have sheet-vinyl flooring. La Jolla Del Sol offers one- and two-bedroom luxury condo-type units with a full array of amenities. This facility includes two pools, jacuzzies, tennis courts, and weight rooms.

Married students without children may reside in a one- or two-bedroom unit. Married students with children may reside in a two- or three-bedroom unit. Single graduate students may choose a studio, one-, or two-bedroom unit. If a two-bedroom unit is selected, at least one other roommate must be a graduate student. Current rental rates range from \$366 to \$954 per month and are subject to change with thirty days prior notice.

The Residential Apartments currently have extensive waiting lists. All policies and procedures concerning the operation of married and

graduate student housing, the eligibility for housing, and the application process are subject to change without notice.

For more detailed information and/or an application, you may write, apply in person, or telephone either of the facilities at the following:

Residential Apartments Office  
UCSD—0907  
9224-B Regents Road  
La Jolla, CA 92093-0907  
(619) 534-2952  
La Jolla Del Sol  
UCSD—0913  
8046 Regents Road  
San Diego, CA 92122  
(619) 587-1221

### **INTERNATIONAL CENTER**

(Located at the corner of Hutchison Way and Gilman Drive)  
Mail code 0018  
534-3730  
Facility reservation: 534-6442

The International Center assists U.S. students going abroad as well as foreign students, scholars and families, and facilitates interaction among all internationally minded UCSD students, faculty, and staff.

Services to students going abroad include advising on a wide range of study, work, and travel opportunities through the UCSD Programs Abroad Office, and administration of the systemwide UC Education Abroad Program.

The Foreign Student/Scholar Office serves as the liaison with government agencies for all nonimmigrants, and advises foreign students, researchers, faculty, and campus departments about immigration and visa matters. The office also provides pre-arrival information, orientation, and check-in for new students and scholars. The Friends of the International Center provide additional services and programs to foreign visitors and their family members.

The staff and Friends of the International Center as well as the International Club sponsor a variety of international/intercultural programs and services for all members of the UCSD community. These include lectures, language exchanges, a tutoring program, linkages with international faculty specialists, and weekly international cafes.

The International Center facility also includes a resale shop, a reservable conference room, and a meeting/office facility for



## CAMPUS SERVICES AND FACILITIES

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Oceanids, the women's volunteer support organization for the university.

### **PSYCHOLOGICAL AND COUNSELING SERVICES**

Central Location:  
1003 Galbraith Hall  
Revelle College  
Mail code 0304  
534-3755

Psychological and Counseling Services provides professional assistance to students having difficulty in coping with any of a wide array of problems. In addition, members of the staff offer professional consultation to the university regarding matters of student behavior to prevent problems and enhance the student experience.

Specific problems for which students may seek help include loneliness and isolation, personal problems, homesickness, parent/family problems, difficulties with studying, concentrating and test taking, relationship/marital problems, sexual difficulties, educational/career questions, depression, and anxiety.

Individual and group counseling, psychotherapy, marriage or relationship counseling, sex therapy, family therapy, behavioral and hypnotic techniques, and many issue-related groups are provided for dealing with these problems.

During any year support groups, such as ones for ethnic minorities, reentry students, women in medicine, men in medicine, women in science and engineering, and gay and lesbian students are offered. Time-limited focus groups include social skills, coping skills, assertion training, stress management, test anxiety reduction, decision making, coping with alcohol and drug abuse, eating disorders, enhancing creativity, weight management, and life-style workshops.

Members of Psychological and Counseling Services are clinical and counseling psychologists and social workers. The service has offices at all colleges in addition to the central location.

Services are available to any regularly enrolled undergraduate, graduate or medical school student, by contacting the central office. The counseling relationship is private and confidential.

### **CAMPUS RECREATION**

Canyonview Athletic and Recreation Complex  
Mail Code 0905  
534-4037

Campus Recreation provides UCSD students with quality recreation programs. They are designed to meet leisure-time needs and interests through on-campus programs offering clubs, intramural sports, recreation classes, outings, and a myriad of activities and special event programming. Our goal is to provide opportunities promoting a lifetime of health-conscious options.

#### **Facilities**

Main and Recreation Gymnasia  
Indoor 25-Yard Natatorium Pool and Spa  
Outdoor 50-Meter Canyonview Pool and Spa  
Canyonview Racquetball Center  
Tennis Courts  
Playing Fields  
Canyonview Weight Room  
Golf Driving Range  
Mission Bay Aquatics Center  
Spanos Training Facility with weight training equipment, martial arts studio, and trainers' facility  
Running and Jogging Track  
Par Courses  
Sand Volleyball Courts  
Outback Adventures equipment rentals

#### **INTRAMURAL SPORTS**

The Intramural Sports Program at UCSD is a balanced blend of team and individual sports activities that are designed to meet the diverse needs of the campus community. Sports offered include flag football, floor hockey, tennis, basketball, softball, soccer, bowling, volleyball, tube water polo, badminton, and over-the-line.

#### **RECREATION CLUBS**

Recreation Clubs are special-interest activity clubs open to the entire campus community. The clubs are designed to bring together people with common interests. Students may join or begin new recreation clubs and participate in the workouts, meetings, social gatherings, and special events that are part of the RecClub structure. RecClubs include interests from aerobics to wrestling.

#### **SPORT CLUBS**

Sport Clubs are those teams that compete on an intercollegiate basis but without many of the restrictions of the formal Intercollegiate Athletic Teams. The clubs offer students the opportunity to become involved in somewhat less traditional competitive sports, while still enjoying the travel to and competition against other institutions. Teams include cycling, lacrosse, sailing, surfing, rugby, snow ski racing, ice hockey, and ultimate disc.

#### **RECREATION CLASSES**

Recreation classes provide students and the university community an opportunity for non-credit, nongraded instruction in a range of physical and leisure activities. The program includes professional instruction in everything from aerobics, tennis, weight training and swimming to karate, gymnastics, dance, and yoga.

#### **OUTBACK ADVENTURES**

Outback Adventures (outdoor recreation program) is a passport to adventure and the great outdoors. The program offers fun, full-service trips (transportation, meals, instruction, equipment) in backpacking, rock-climbing, cross-country skiing, canoeing, kayaking, mountain-biking, and other outdoor pursuits. The Outback Adventures director will also arrange customized trips. In addition, the program offers instructional workshops, a resource library of maps and park information, and a camping and outdoor equipment rental service which includes downhill and cross-country skiing equipment, camping equipment, and game equipment.

#### **AQUATICS**

UCSD Campus Recreation Aquatics encompasses a wide range of aquatic activities. Student users can participate in competitive and training programs in diving, swimming, and water polo. Special events scheduled throughout the year range from student social activities to international team competitions. Additionally, an extensive recreational lap swim program is maintained to accommodate daily users from the campus and community.

#### **OPEN (INFORMAL) RECREATION**

Open recreation provides individuals and groups of students the opportunity to make use of any and all of the physical activity facilities at UCSD. From jogging on the par course to shoot-

ing hoops in the gym, "open rec" time allows students to develop their own leisure activities.

**MISSION BAY AQUATIC CENTER**

Located on Santa Clara Point in Mission Bay, this facility and its programs provide students with an exclusive opportunity to participate in all aspects of aquatic recreation. From highly structured classes to equipment rentals, MBAC is a "first class" operation. (488-1036)

**INTERCOLLEGIATE ATHLETICS AT UCSD**

With twenty-two teams to choose from, the Intercollegiate Athletics Program provides students with varying interests the opportunity to participate in a highly competitive program. As a nonscholarship institution, UCSD's Tritons compete in the NCAA Division III, achieving national prominence in several sports. The women's volleyball team is the only collegiate team at any level to have captured five national women's volleyball championships, winning the NCAA title in 1981, 1984, 1986, 1987, and 1988. Women's tennis has also brought back championship trophies, winning national titles in 1985, 1987, and 1989. The men's soccer team won its first national championship in 1988, while the women's soccer team was the best in the nation in 1989. In addition, the women's water polo team won the USA Collegiate National Championship in 1985.

Over the past decade, UCSD has produced national runners-up in men's golf (1985, 1986, 1987), women's swimming (1986, 1988, 1989), men's soccer (1986), women's volleyball (1982, 1983), women's soccer (1988), men's swimming (1989), women's water polo (1989), and women's tennis (1982, 1984); and national third place teams in men's swimming (1984, 1985, 1986, 1987, 1988), women's swimming (1985, 1987), women's soccer (1986), women's tennis (1988), women's water polo (1988), and men's soccer (1989). The Tritons have also reached the national top ten in men's baseball, men's tennis, women's softball, and women's track and field. Individually, 37 Tritons have captured national championships, while 300 have been named All-Americans during the 1980s. Twenty were named Academic All-Americans and three were given the prestigious NCAA Postgraduate Scholarship.

Sports offered for men and women include volleyball, basketball, soccer, tennis, swimming and diving, water polo, cross country, crew, fencing, track and field, and golf. Men's baseball and women's softball are also offered.

In addition, the intercollegiate athletic department sponsors club sports including surfing, badminton, cycling, sailing, rugby, snow skiing, and lacrosse. Opportunities to be a part of the athletic atmosphere are also available in the UCSD Pep Band, Cheerleaders, and Triton Athletic Associates. In each of the intercollegiate programs, student/athletes enjoy healthy physical activity, the struggle for excellence, travel with teammates to other universities, a sense of belonging, and a feeling of pride in their team and university.

**OFFICE OF RELIGIOUS AFFAIRS**

Building 502, Matthews Administrative and Academic Complex  
Mail code 0081  
534-2521

See "Student Affairs/Special Services," below.

**STUDENT AFFAIRS/SPECIAL SERVICES CENTER**

Building B, Student Center  
Mail code 0309

The Student Affairs/Special Services Center (SA/SSC) comprises the following units:

Commuter Student Services, Student Legal Services, Disabled Student Services, Office of Religious Affairs, Student Affirmative Action, Student Safety Awareness, and the Office of Student Judicial Affairs, including student conduct and discipline as well as grievance procedures under Titles VI and IX, Section 504 of the Rehabilitation Act of 1973, and Right to Privacy as it affects students.

The goals of the SA/SSC are to ensure effective delivery of services to our student population, and to assure fair, consistent, and equitable administration of student conduct and student affirmative action procedures and requirements. All of the programs under the SA/SSC are housed in Building B of the Student Center with the exception of Disabled Student Services, which is located in Building 204 Matthews Administrative and Academic Complex and Office of Religious Affairs, which is located in Building 502 Matthews Administrative and Academic Complex.

**JUDICIAL AFFAIRS**

534-6225

Judicial Affairs consists of the administration of student judicial affairs which includes campus-wide coordination of student conduct, including graduate students, monitoring of



compliance requirements of Titles VI and IX, Section 504 of the Rehabilitation Act, Right to Privacy as it affects students, and the Student Diversion Program. In addition, the director also provides legal advice and consultation to all Student Affairs units including the vice chancellor, Student Affairs and the college and resident deans.

### **STUDENT AFFIRMATIVE ACTION**

SAA & HR Programs Office: 534-6708  
Program Interns Office: 534-2573  
Student Affirmative Action Committee (SAAC): 534-2573  
Human Relations Coalition (HRC): 534-2573

The responsibility of this unit is to serve as a campus resource on issues of cross-culturalism, on situations of racial/ethnic and gender insensitivity or discrimination, and on the recruitment/retention/academic achievement/graduation of affirmative action students. There is also a focus on human relations issues—emphasizing the need for people within the UCSD community to understand and appreciate those different from themselves. These educational efforts include workshops, cross-cultural immersion experiences, leadership development training, and in-service training programs.

In addition to these educational programming activities, at present, the following components constitute Student Affirmative Action and Human Relations Programs:

- Complaint Report/Resolution Center
- Human Relations Coalition (HRC)
- Oversight and Update of the UCSD Five-Year SAA Plan
- Programming/Funding on Diversity and Human Relations Issues
- Student Affirmative Action Committee (SAAC)
- SAA Internship Program

The Human Relations Coalition (HRC) is composed of a myriad of student representatives from across the UCSD community. The HRC was established to provide a direct link between students and the university administration on human relations issues (e.g., free speech infringement, hate crimes, intergroup conflict, religious intolerance and insensitivity, etc.). The HRC seeks to ensure a civil and supportive campus climate by promoting and fostering mutual respect and understanding among all groups and individuals within the

UCSD community. Additionally, the HRC provides a much needed forum in which to identify and ameliorate human relations problems at UCSD.

The Student Affirmative Action Committee (SAAC) comprises one representative from each of the six affirmative action student organizations: African-American Student Union (AASU), Asian/Pacific Student Alliance (APSA), Disabled Students Union (DSU), Movimiento Estudiantil Chicano de Aztlan (MEChA), Native American Student Alliance (NASA), and the Women's Resource Center (WRC). SAAC serves in an advisory capacity to the vice chancellor for Student Affairs on issues which affect the quality of campus life and the educational experience of underrepresented students at UCSD. The elected representatives serve as voting members of SAAC generally for one academic year.

The internship program is the vehicle by which SAAC is able to review and evaluate the Student Affairs programs and units, thereby ensuring responsiveness to the needs of affirmative action students. The interns also provide the research and informational basis for appropriate recommendations from SAAC to the vice chancellor for Student Affairs. The internship program started in 1976; since its inception, the interns have researched a number of assigned topics and areas within student and academic affairs at UCSD. Upon completion of the assignment, the interns submit their findings to SAAC, from which a written evaluative report—including recommendations, where appropriate—is provided to the vice chancellor for Student Affairs.

SAA programming was established in an effort to assist SAAC constituent organizations and other student groups engaged in planning programs which improve or enhance the goals of the UCSD student affirmative action program and the Five-Year SAA Plan.

### **STUDENT LEGAL SERVICES**

534-4374

Student Legal Services (SLS) provides advice, counsel, and assistance to UCSD students in legal matters. It prepares and drafts legal documents for students seeking to represent themselves in court. These include Petitions for Dissolution, Name Change, Adoption, and Answers to Complaints for Unlawful Detainer. Student Legal Services also counsels and prepares students for court appearances, i.e., Small Claims, Municipal, Traffic, and Mis-

demeanor Arraignment hearings. As SLS cannot represent students, if such representation is deemed necessary the student is referred to an outside attorney or agency specializing in that particular area of the law.

### **STUDENT SAFETY AWARENESS PROGRAM**

534-5793

The Student Safety Awareness Program seeks to increase awareness about the problem of sexual assault and to prevent and decrease the incidence of this crime. The goal of the program is to educate both men and women by dispelling the many myths that abound, by providing and publishing updated printed material such as brochures and pamphlets, and by providing programs and workshops on rape prevention and education, including self-defense techniques and strategies, assertiveness training, and coping mechanisms. Counseling and extensive referrals are available.

The program also provides information and education in the areas of sexual harassment and personal safety. Students who have questions and/or concerns about sexual harassment may seek confidential assistance by calling the above number.

### **COMMUTER STUDENT SERVICES OFFICE**

534-3670

A major function of this office is to assist commuter students in their search for non-university housing. This office maintains an up-to-date listing service for a variety of rentals in various areas near the campus. These listings, advertised on bulletin boards within the office, include individual houses, ) condos, and apartments, as well as roommate, room in a private home, and work-exchange situations. Listings are not mailed as availability changes daily.

UCSD is located in the midst of a resort area, commanding higher rents than most other areas in San Diego County. Lower rentals may be found as you travel south and inland of the campus. A general rule is, the closer to the beach the higher the rent.

Approximate monthly costs for unfurnished rentals, excluding utilities, are:

\$300-\$450—for furnished room with kitchen privileges

\$250-\$500—for own room in a home with other students (roommate)

- \$425-\$625—for studio or bachelor apartment
- \$500-\$800—for one-bedroom apartment or house
- \$675-\$1,100—for two-bedroom apartment, condo, or house
- \$1,000-up—for three-bedroom apartment, condo, or house
- \$1,500-Up—for four-and five-bedroom house

Furnished rentals will generally cost an additional \$50 to \$100 per month.

It is suggested that students who wish to find off-campus housing plan to make arrangements early by consulting the available rentals posted in the office. The best time to begin looking for housing is from two to three weeks before the start of the fall quarter, and one to two weeks before the spring and winter quarter.

During September, the office operates a Temporary Emergency Housing Program. The program provides dorm-style lodging for students while they locate permanent housing. Space is limited, and reservations are recommended.

A variety of house-hunting aids are available: current classifieds from all local newspapers, rental publications, landlord/tenant information, maps, bus schedules, and courtesy telephones are available for your use.

The Commuter Student Services Office is supported by student fees and its services are available to registered students only. Students are required to bring a registration ID card or a letter of acceptance when using the office services.

### RELIGIOUS AFFAIRS

Building 502 Matthews Administrative and Academic Complex  
Mail code 0081  
534-2521

The Office of Religious Affairs is a cooperative venture of representatives from various religious denominations for the purpose of providing religious counseling and other religiously oriented programs to students, faculty, and staff at UCSD. The office also serves as a theological resource concerning current moral and ethical issues, as well as a center for facilitating communication between the university and community religious organizations.

### DISABLED STUDENT SERVICES

Building 204 Matthews Administrative and Academic Complex  
Mail code 0019  
534-4382/534-2494 (TDD\*)  
(Telephone for the deaf ONLY)

The primary objective of the Office of Disabled Student Services is to integrate and mainstream students with disabilities into general campus programs and activities. The ability of each disabled student to function independently in the educational environment is the ultimate goal.

The following services are available to meet the individual needs of disabled students:

1. Disability Management Advising
2. Academic Support Coordination: readers, interpreters, notetakers, lab/library assistants, typists.
3. Special Equipment Loan Service: manual wheelchairs, powered wheelchairs, cassette recorders, talking calculators, print enlargers, telecommunication phone devices for the deaf, phonic ears, and other supportive special equipment for students with disabilities are available at Disabled Student Services.
4. Equipment Repair Service: Minor repairs to wheelchairs and other mobility-related equipment are available at Disabled Student Services by appointment. Appointments are not necessary in emergency situations.
5. On-Campus Transportation: Disabled Student Services operates a prior-scheduled on-campus transportation system for students with permanent and temporary disabilities. Prior-scheduled pick-up times can be reserved by disabled students from 8:45 a.m. to 4:00 p.m., Monday through Friday, for on-campus transportation needs. Prior notification by regular users of the transportation system is required by Thursday at 12:00 noon in order to change their schedules for the following Monday through Friday. New users of the transportation system can schedule their transportation needs for the current sign-up week. On-call transportation requests can be made with twenty-four-hour notice, but on-call transportation services will be provided only after all prior-scheduled pick-ups have been completed.
6. Special Parking Coordination
7. Special On-Campus Housing Coordination
8. Registration/Enrollment Assistance

9. Test-Taking Arrangements
  10. Resource Library
  11. Liaison with the California State Department of Rehabilitation
  12. Referrals to Resources, Services, and Agencies
  13. Campus Accessibility Map
- Documentation of disability will be required for the delivery of most services for disabled students.*

### STUDENT HEALTH SERVICE

Mail code 0309  
534-3300

Comprehensive primary health care is provided at the Student Health Service without charge during the academic year for all university registration fee-paying students. Services are available during the summer for a modest fee. A well-qualified medical staff is in attendance at the Student Health Center, and students are encouraged to come for professional and confidential attention to any health problem or concern. Students can be seen on a walk-in basis or by appointment from 8:00 a.m. to 4:30 p.m., Monday, Tuesday, Thursday and Friday and 9:00 a.m. to 4:30 p.m. on Wednesday.

The Student Health Service offers Women's, Men's, and Dermatology Clinics on a scheduled basis. Health education and promotion and birth control services are provided, as are laboratory and X-ray services. Low-cost pharmacy and immunization services are available as well as optometric and dental care.

Entering students are requested to complete and return a Medical History form prior to registration. The information submitted to the Student Health Service is kept confidential and is carefully reviewed to help provide optimal health care. Students are also urged to submit a physical examination form completed by their family physician, particularly if they plan to enter into intercollegiate athletic competition.

Although undergraduate, graduate, medical, and nurse practitioner students may have unlimited visits with the Student Health Service staff, students requiring medical or surgical care beyond that available from the staff should be prepared to meet the costs of such care. All students are strongly urged to provide themselves with adequate sickness and accident insurance.



A *Student Limited Insurance Plan (SLIP)* is provided without charge to all eligible students to help them defray some of the expenses of necessary *outpatient* care beyond that which can be provided directly by the Student Health Service. Within specified limits, this plan provides benefits for laboratory tests, x-rays, consultations with specialists, emergency room care, and ambulance transportation.

A *Voluntary Insurance Plan (VIP)*, available for purchase by undergraduate students each quarter, adds benefits for hospitalization, surgery, and major medical expenses. The premium for this insurance plan may be paid along with student fees.

Participation in the *Graduate Student Health Insurance Plan (GSHIP)* is mandatory for all graduate, professional and foreign students. GSHIP provides benefits for certain outpatient services, hospitalization, surgery, and major medical expenses. The fee for GSHIP is paid by the university for graduate and professional students holding academic appointments of 25 percent time or more.

Brochures describing these three insurance plans and their limitations, exclusions, and open enrollment periods are available at the Student Health Center. A representative of the insurance company who has an office at the

Student Health Service may be consulted regarding these plans.

### UNIVERSITY CENTERS

The two buildings which constitute the University Centers at UCSD provide the campus community with services and programs beyond the teaching and research functions of the university. Both the Price Center and the Student Center are places for students to meet, dine, and relax. The centers provide services and activities designed to meet the demands and needs of the student population.

#### THE PRICE CENTER

Mail code 0076

Administration office: 534-4022

Located in the center of campus, just south of Central Library, the Price Center houses a variety of services. With seven fast-service restaurants, a movie theater, computer lab, post office, four ATMs, travel service, box office, art gallery and photo lab, the center's aim is to meet the needs of UCSD's diverse community. The Price Center has for reservation fourteen meeting/conference rooms, including a spacious Grand Ballroom. Comfortable lounge areas and a music listening lounge, as well as a unique game room allow students to relax, listen to music, or play a variety of

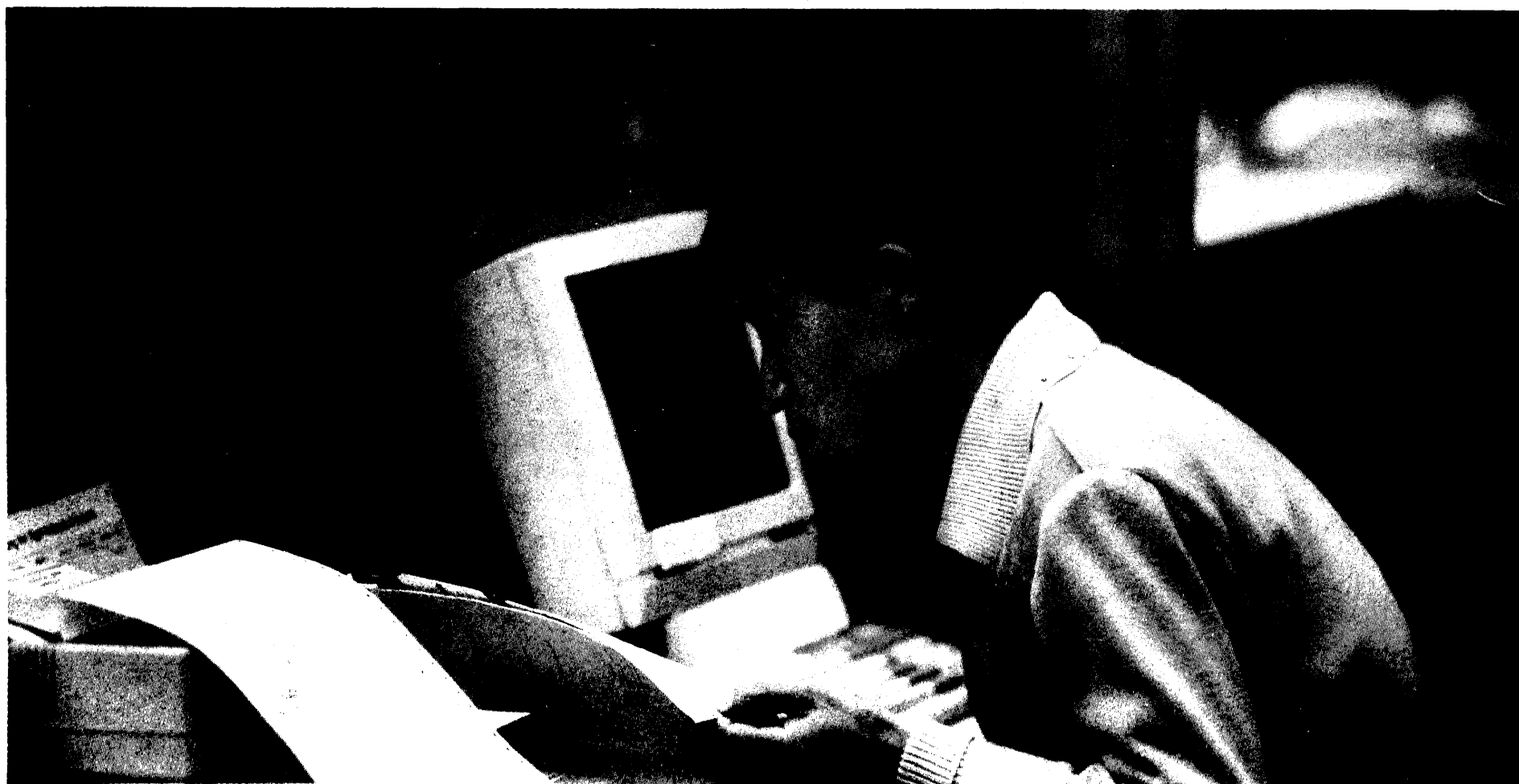
games. Student organizations and student government offices are located in the center as well. Administrative offices of the University Centers, University Events & Student Activities and the Associated Students are also housed here, along with the Women's Resource Center and Alumni Offices. In addition, the Price Center is the home of the UCSD Bookstore.

#### THE STUDENT CENTER

Mail code 0323

Administration office: 534-8929

The Student Center, located east of the Main Gym, offers services operated by students. The student-run co-ops and enterprises include the General Store Co-op, Bike Shop, Food Co-op, Soft Reserves/Lecture Notes, Groundworks Books, Computer Co-op, and KSDT Radio. The Grove Caffe serves specialty coffees and pastries as well as other food and drink. Located next to the Grove Caffe are the Craft Center and the Grove Gallery. The Craft Center offers a variety of classes to students, faculty, and staff. The Grove Gallery hosts art exhibitions and showcases student-made art. The campus media, including the UCSD *Guardian*, and some student organization offices are located on the Student Center's second level. The Ché Cafe restaurant, a part of the Student Center complex (located at the





southern end of Reville campus), offers a vegetarian menu at affordable prices.

**STUDENT INFORMATION CENTER (EDNA)**

Mail code 0076  
Administration Office: 534-3362

Located in the Price Center Plaza next to the theater lobby, the information desk serves the campus community by providing information and providing information and a variety of other services benefitting the students, faculty, and the general public alike.

If the student staff cannot answer your question, they will direct you to the proper person or agency.

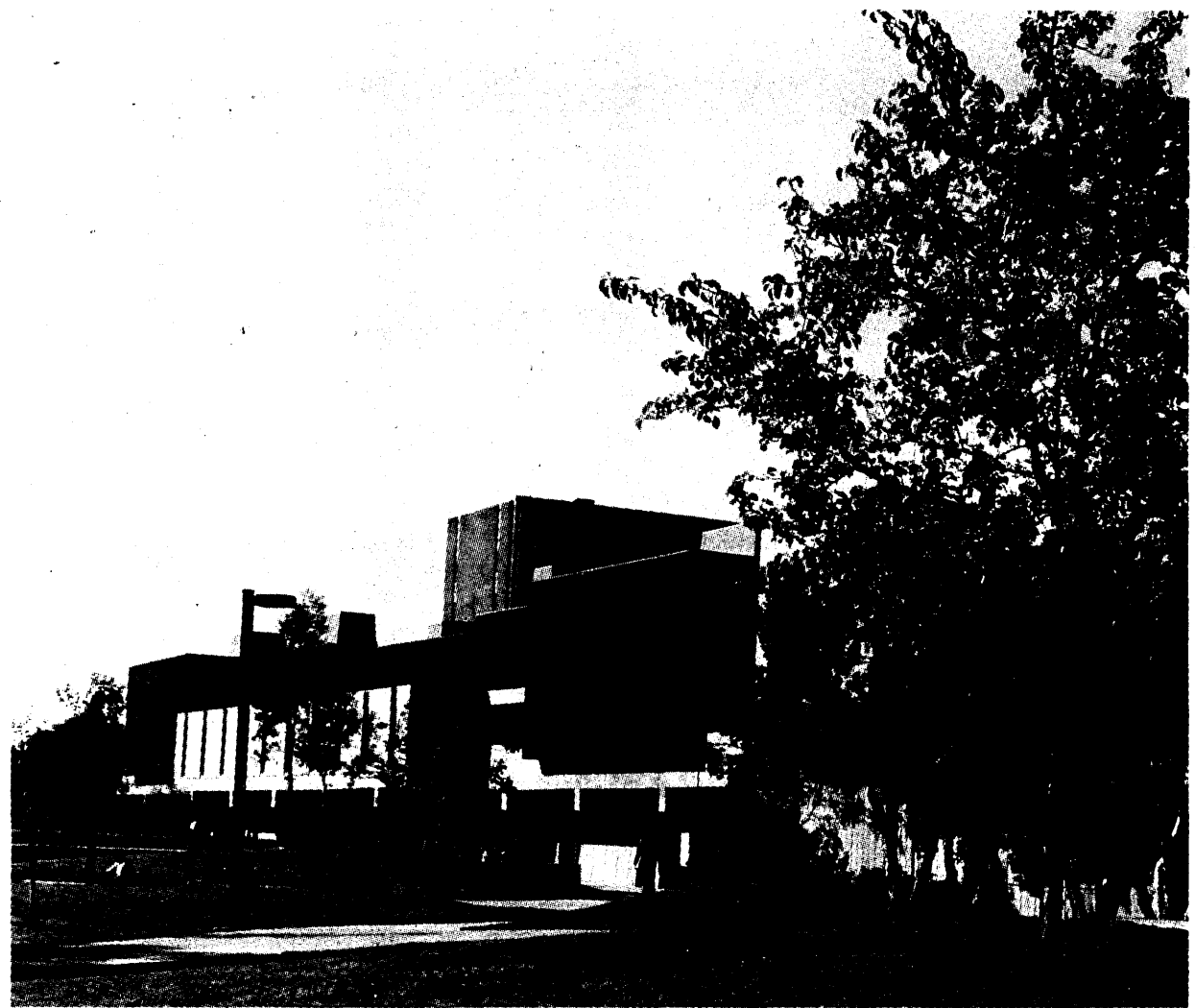
**STUDENT GOVERNMENT SERVICES**

Associated Students  
Third Floor, Price Center  
Mail code 0077  
ASUCSD: 534-4450  
Hours: 8:00 a.m.–4:30 p.m. Monday–Friday  
Graduate Student Association  
Second Floor, Student Center A  
Mail code 0353  
GSA: 534-6504  
Hours: 8:00 a.m.–4:30 p.m. Monday–Friday

The Associated Students Government (ASUCSD) and the Graduate Student Association (GSA) provide students with practical leadership experience in the areas of programming, financial planning, and in the development of programs and services which are designed to meet the students' needs. The ASUCSD owns and operates Assorted Vinyl, ASIO, Grove Caffe, Lecture Notes, Soft Reserves, U.S. Grants, and the Volunteer Connection. The ASUCSD also sponsors a wide variety of programming, including concerts, films, and festivals. The GSA takes a pro-active stance on graduate concerns in the areas of housing, TA/RA work-related issues, and mandatory health insurance. The Student Government staffs work with the AS and the GSA in providing logistical, accounting, and programmatic advice. The student leaders and the staff of the ASUCSD, the GSA, and the Student Government Services office encourage you to get involved and take part in the many leadership opportunities available at UCSD.

**UNIVERSITY EVENTS OFFICE**

Price Center  
Mail code 0078  
534-4090



The University Events Office is a central resource for programming of events and activities at UCSD. The office hosts over one hundred events annually. It provides the campus and community with programs in the areas of fine arts, films, speakers, and popular entertainment.

The staff is a central resource for programming advice and assistance in the areas of event planning, publicity, ticket handling, and contracting. The management of the Central Box Office provides for the sale of tickets to most campus events as well as tickets sold on the Ticketmaster system to events in town and around the country. Administration of the Master Calendar for Public Events provides a clearinghouse for all public events.

**STUDENT ORGANIZATIONS AND LEADERSHIP OPPORTUNITIES**

Price Center  
Mail code 0078  
534-4090

The office of Student Organizations and Leadership Opportunities strongly supports the notion that the university must provide learning experiences for students both within and outside the classroom. Participating in

leadership workshops, seminars, conferences and in any of the over 250 student organizations is an integral part of the university experience. With so many organizations to choose from, there is bound to be one that sparks individual interest. If not, students can start their own organization! Registration for student organizations begins in the fall and continues throughout the academic year. The advisers are here to assist in selecting an organization or in starting one.

In addition, leadership seminars are organized to help strengthen the leadership potential of students. Listed below are some of the training programs we schedule each year:

- Improving interpersonal skills
- Public relations
- Interviewing techniques
- Fund raising
- Team building
- Running effective meetings
- Time management
- Careers in student affairs
- Budget management
- Motivation
- Stress management



- Ethics
- Publicity/advertising
- Recruiting volunteers
- Diversity

We invite you to stop by the third floor of the Price Center to learn more about student organizations and leadership opportunities!

### **VETERANS' AFFAIRS**

Building 210 Matthews Administrative and Academic Complex  
Mail code 0013  
534-4483

#### **ELIGIBILITY**

The following persons may be eligible for federal veterans' educational benefits:

1. Sons, daughters, spouses, and surviving spouses of veterans who died in service; who died as a result of a service connected disability; who became permanently and totally disabled as a result of a service connected disability; who died while a disability so evaluated was in existence; or who have been listed as missing in action, captured, detained, or interned in line of duty by a foreign government or power for more than ninety days.
2. A servicemember who entered service after December 31, 1976 and who contributed to an education fund.

3. Members of the Selected Reserve who enlist, reenlist, or extend an enlistment for a six-year period or more, beginning July 1, 1985.
4. A veteran of World War II or thereafter who has a service connected disability and needs vocational rehabilitation. In addition to federal veterans' educational benefits, this office can assist you in attaining California benefits if you meet the requirements listed in 1 above and if the veteran was a resident of California.

#### **ACADEMIC REQUIREMENTS**

A student receiving veterans' benefits is required to maintain satisfactory progress and conduct according to standards established and enforced by the institution, fully and clearly published in this catalog under "Academic Regulations."

All students who are on probation more than one quarter or who are subject to academic disqualification are considered to be making unsatisfactory progress according to V.A. regulations and are not eligible to receive their veterans' benefits. Their status will be reported to the Veterans Administration.

#### **OTHER SERVICES**

In addition to certifying paperwork to initiate a student's veterans' benefits, the Office of Veterans' Affairs staff can answer questions about check problems or other programs administered by the Veterans Administration

such as tutorial assistance and VA work-study, or can provide you a phone number so that you can make an inquiry to the Veterans Administration Regional Office.

Upon admission to the university, please contact the Veterans' Affairs Office to request certification of VA educational benefits.

### **OTHER SERVICES AND PROGRAMS**

#### **UCSD ALUMNI ASSOCIATION**

Price Center  
Mail code 0083  
534-3900

Founded in 1972 with a grant from the University of California Board of Regents, the UCSD Alumni Association provides a principal link between graduates and the university. Revenues generated by this nonprofit membership organization enable the association to provide student scholarships, honor distinguished alumni, provide career services and programs, develop regional clubs, and participate in legislation affecting higher education.

The association is governed by a board of volunteer alumni directors who are elected by members and who are representative of all of the UCSD colleges.

Members of the UCSD Alumni Association enjoy free library privileges at all UCSD and



UC libraries, educational and professional seminars, travel programs, a subscription to *UCSD Perspectives*, discount cards, and a members only newsletter.

**ART GALLERIES**

**MANDEVILLE ART GALLERY**

Mandeville Center, Room 101  
Mail code 0327  
534-2864

Mandeville Art Gallery exhibitions cover a wide range of fields, with an emphasis on changing exhibitions of contemporary works. Last year's exhibitions included: *Derek Boshier: New Paintings*; *Dana Salvo — "Nichos y Nacimientos": Home Altars of Mexico*; *Mexican Retablo Paintings*; *video works by UCSD faculty and graduate alumni*; *UC San Diego Faculty Exhibition*; *Manfred Müller/Sculpture Installations and Julia Lohmann/Sculptural Events*; and *WORLDWIDE, Leon Golub Installation Work*.

Gallery hours are from 12:00 noon to 5:00 p.m., Tuesday through Sunday. The gallery is closed Mondays and holidays. There is no admission charge.

**MANDEVILLE ANNEX GALLERY**

Mandeville Center, Room B-118  
Mail code 0327  
534-3102

The Mandeville Annex Gallery is a graduate and undergraduate student gallery. A new exhibition is mounted each week of the quarter. Included in the exhibition schedule are visual arts group class shows and M.F.A. exhibitions. Gallery hours are from 12:00 noon to 5:00 p.m., Monday through Friday. There is no admission charge.

**CRAFTS CENTER**

Mail code 0338  
534-2021

Located in the center of the campus, the Crafts Center offers studio and art/crafts instructional facilities in ceramics, photography, jewelry, drawing, neon, and other crafts. The center provides personal enrichment and creative educational opportunities to individuals wishing to develop artistic skills in an active studio-classroom situation.

The Grove Gallery is a part of the center, and offers ongoing exhibits of contemporary crafts and ethnic arts. The Grove Gallery Store

sells an international selection of handmade crafts and other decorative accessories.

Registration for Crafts Center activities takes place the first week of every quarter at the center. Specific classes, schedules, and course fees information can be obtained by calling 534-2021.

**DAY CARE CENTER**

Mail code 0962  
534-2768

The UCSD Early Childhood Education Center serves the children of students, staff, and faculty. Age requirements are eleven months and walking to age five and one-half. State subsidy is available for income eligible, full-time students on a limited basis. Only full-time enrollment is offered, 7:45 a.m. to 5:00 p.m., Monday through Friday. Breakfast, lunch, and afternoon snack are included in the cost. For further information or to visit, call or make an appointment with the director.

As an alternative, the Infant Toddler Referral Service aids campus families in locating licensed home-care providers from six weeks through preschool ages. For assistance, call 534-7740 during office hours or leave a recorded message for a return call.

**PARKING AND TRANSPORTATION SERVICES ON CAMPUS**

Building 400 Matthews Administrative and Academic Complex  
Mail code 0040  
534-4223

Parking permits are required on the UCSD main campus from 7:00 a.m. to 11:00 p.m. Monday through Friday, Saturday and Sunday 10:00 a.m. to 11:00 p.m., and at Scripps Institution of Oceanography from 7:00 a.m. to 5:00 p.m. every day, unless otherwise posted. This requirement is enforced by the Department of Community Safety through the issuance of parking citations.

Permits are available at the Parking Office, Building 400 Matthews campus. Permits may be picked up between the hours of 7:30 a.m. and 4:30 p.m. Request for a permit requires a completed application. Applications can be obtained at the Parking Office. Student "S" permits must be paid in advance, preferably through registration fees; otherwise payment will be made to the Central Cashier. Quarterly student permits are also available. Student

permits are valid only in yellow-striped spaces. A grace period during Welcome Week of the fall quarter *only* allows students to park in yellow-striped spaces without a permit. Effective the first day of classes of fall quarter, all vehicles parked on university property must display a valid parking permit.

If you have any questions about parking, phone 534-4223. Those who are interested in joining a carpool, forming a vanpool, or getting information on San Diego Transit or North County Transit phone 534-RIDE.

**PRINTING AND DUPLICATING SERVICES**

Campus Services Complex, Bldgs. A and B  
Mail code 0031  
534-3020

Several kinds of printing and duplicating services are available on campus. The Price Center has self-service photocopying machines which make copies for \$.05 a page.

The copier machine located in Graphics and Reproduction Services, Campus Services Complex, Buildings A and B, is especially good for thesis work requiring excellent copy quality. Copies cost \$.05 each, and students are requested to reserve time in advance for the use of the machine. "On demand" electronic publishing is available from a large variety of electronic input.

**STUDENT MAIL SERVICES**

Campus Services Complex, Bldg. A  
Mail code 0047  
534-7098

The Student Mail Services provides Monday through Saturday distribution of mail to resident students during the academic year. Hours of operation are 7:30 a.m. to 4:30 p.m.

**UCSD BOOKSTORE**

Price Center  
Mail code 0008  
534-READ

In addition to required textbooks and reading materials, the UCSD Bookstore makes available an extensive selection of general, medical and technical books, including academic and scholarly titles, UCSD faculty authors, literature, reference, and bestsellers. Computers, computer supplies, software, and a computer repair service are provided for the campus community. The bookstore also stocks a full line of school and office supplies, elec-

## CAMPUS SERVICES AND FACILITIES

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tronic calculators, art and engineering supplies, and medical instruments. Hours are 8:00 a.m. to 6:00 p.m. Monday through Friday, Saturday 10:00 a.m. to 5:00 p.m., with extended hours during rush periods in the first two weeks of every quarter.

### **SUNSHINE STORE**

Price Center  
Mail code 0008  
534-2875

The Sunshine Store carries snacks, sundries, school supplies, and newspapers. Film and film processing are also available. Hours are 7:00 a.m. to 9:00 p.m. Monday through Friday; Saturday 10:00 a.m. to 7:00 p.m.; Sunday 10:00 a.m. to 5:00 p.m.

### **REVELLE SUNDRY STORE**

Blake Hall, Revelle campus  
Mail code 0311  
534-2035

The Revelle Sundry Store offers snacks, gifts and greeting cards, school supplies, and film and film processing. Hours are 7:30 a.m. to 8:00 p.m. Monday through Friday.

### **CHECK CASHING (THREE LOCATIONS)**

With proper identification, students may cash checks up to \$50 for a small charge at the Central Cashier's Office, Building 401 Matthews Administrative and Academic Complex, (Hours: Monday through Friday, 9:00 a.m.-3:00 p.m.), and the Central Box Office, Price Center (Hours: Monday through Friday, 10:00 a.m. to 2:00 p.m.).

With required identification, students may cash personal checks up to \$50 for a nominal charge at the UCSD Bookstore (Hours: Monday through Friday, 8:00 a.m. to 6:00 p.m. and Saturday, 10:00 a.m. to 5:00 p.m.) and the Revelle Sundry Store (Hours: Monday through Friday, 7:30 a.m. to 8:00 p.m.).

### **UNIVERSITY POLICE DEPARTMENT**

Building 500 Matthews Administrative and Academic Complex  
Mail code 0017  
**EMERGENCY, DIAL 9-1-1**  
Business, 534-4357

The duty of the UCSD Police Department is to protect life and property through the enforcement of local, state, and federal laws. It is the goal of the police department to ensure the

existence of a safe campus environment, free from unlawful disruptions and illegal activities, in an environment where the educational and research pursuits of the university can be realized.

The Police Department provides continuous twenty-four-hour-a-day police patrol to protect the campus community, along with the dispatching of emergency fire and ambulance services.

In addition, student residential areas are provided with additional security with on-site security guards during the evening and early morning hours.

### **CRIME PREVENTION PROGRAM**

534-3644

The Police Department's Crime Prevention Program offers a variety of information to the campus community on crime prevention methods. Pamphlets, displays, and informative seminars are available.

### **COMMUNITY SERVICE OFFICER PROGRAM**

534-9255

CSOs are students employed by the UCSD Police Department. They provide a variety of services related to crime prevention and campus safety. One of the services is the ESCORT program, which is available every evening from 5:00 p.m. to 1:00 a.m.

### **BICYCLE AND SKATEBOARD PROGRAM**

534-7335

The UCSD Police Department's Bicycle and Skateboard Program provides enforcement of the UCSD Bicycle and Skateboard Regulations. The program also provides licensing, registration, safety pamphlets, and bike route maps to encourage bicycling as an alternative form of transportation.

### **LOST AND FOUND**

534-4361

The Police Department serves as a central repository for lost and found articles. Lost and found items should be taken to the police station. The station is open twenty-four hours daily.

### **U.S. NEIGHBORHOOD POST OFFICE**

242 Price Center  
Mail code 0324  
534-2052

The Price Center Post Office is a contract station operated under the rules and regulations of the U.S. Postal Service. Stamps, money orders, and other postal items may be purchased and mailed at this location Monday-Friday, 9:00 a.m. to 3:45 p.m. P.O. Box rentals are available in various sizes. Stamp purchases from stamp vending machines are available Monday-Friday, 8:30 a.m. to 7:00 p.m.









Members of organized research institutes and centers carry out advanced research projects, often spanning the areas of knowledge encompassed by several academic departments, and provide opportunities for graduate student support in broad disciplines. The study programs of graduate students supported by institutes and centers are administered by the academic departments in which the students are enrolled. The senior staff of these units are faculty members in related academic departments. Institutes and centers currently in operation at UCSD are described below.

In addition, the university is formally and informally affiliated with various private research organizations such as the Center for Study of Nonlinear Dynamics of the La Jolla Institute, the Institute of the Americas, the Salk Institute for Biological Studies, and the San Diego Supercomputer Center.

## UNIVERSITY-WIDE INSTITUTES/ ORGANIZED RESEARCH UNITS

**California Space Institute (Cal Space)** was established in 1979 as a statewide organized research unit of the University of California. It conducts and supports space research, both pure and applied, with special emphasis on the opportunities created by space science and technology in the applied field. Specific areas of investigation include the following:

*Remote sensing*—the acquisition and processing of data on natural resources and the environment gathered by satellites or other automated devices with remote sensing instruments. Programs explore applications in oceanography, coastal studies, agriculture, forestry, and atmospheric pollution.

*Climate*—atmospheric physics and oceanography as applied to long- and medium-range weather and climate prediction, especially those aspects which utilize remote sensing data. Cal Space takes part with the Climate Group of ORD in the Climate and Remote Sensing (CARS) research group.

*Space resources and human needs*—advanced technologies which can improve access to space. These include automation and robotics, innovative modes of propulsion, and use of extraterrestrial materials. Development

of possible practical uses of special conditions in space of zero or controlled gravity, unlimited and uninterrupted solar heat, and vacuum.

*Minigrant program*—Cal Space supports a program of small grants to investigators on all UC campuses in space-related research, including the fields described above, astrophysics, and space science.

**Institute of Geophysics and Planetary Physics (IGPP)** was established in 1960. Present research concentrates on the study of crustal dynamics by measurements of gravity, tilt, displacement, and strain; of non-Newtonian gravity through continental and oceanic gravitational measurements; of regional seismicity and linear and nonlinear earthquake and explosion source mechanisms; of the variability of the earth's geomagnetic field and its generation by the geodynamo; of the spherical and aspherical structure of the earth by measurements of free oscillations and travel times; of seafloor tectonics using marine geophysical methods; of linear and nonlinear theoretical and computational fluid dynamics; of the variable mesoscale structure of the oceans and global ocean warming by acoustic tomography; of the structure of the oceanic crust and lithosphere by seismic and electromagnetic measurements on the ocean bottom and at the ocean's surface through seismic multichannel methods; and of tides, waves, turbulence, and circulation in the oceans. The institute operates a global network of thirty broadband seismometers, the IDA (International Deployment of Accelerometers) Array, with six of these stations in the Soviet Union which are telemetered by satellite to the institute; a crustal strain and seismic observatory at the Cecil and Ida Green Piñon Flat Observatory near Palm Springs; a southern California network of Global Positioning System (GPS) satellite geodetic sites; an array of ocean bottom seismographs; and a telemetered seismic array in the Anza, California, area. The institute does not grant degrees, but makes its facilities available to graduate students from various departments who have chosen to write their dissertations on geophysical problems. Members of the institute staff now hold joint appointments with the Departments of the

Scripps Institution of Oceanography, Applied Mechanics and Engineering Sciences, and Physics. Support for visiting scholars is provided through an endowment to the Cecil and Ida Green Foundation for the Earth Sciences.

**Institute on Global Conflict and Cooperation (IGCC)** was founded in 1983 as a multi-campus research unit serving the entire UC system. The purpose of IGCC is to study the causes of international conflict and the means of its attenuation. During its first five years, the research program of the institute focused largely on the issue of nuclear-war avoidance through arms control and confidence-building measures between the superpowers. Reflecting ongoing changes in the international system, the research portfolio has diversified to include the international security consequences of such "common enemy" problems as global ecological changes and international economic imbalances, as well as a concern with regional security issues. In addition to research projects undertaken by the central office, IGCC also supports research, instructional programs, and public education throughout the UC system. The institute is supported financially by the Regents of the University of California, and it has been awarded grants by such foundations as Ford, MacArthur, Rockefeller, Sloan, the Carnegie Corporation, and the United States Institute of Peace.

**Institute of Marine Resources (IMR)**, established in 1954, is a university-wide organization with its headquarters and principal operating units at the UCSD Scripps Institution of Oceanography. An executive committee provides representation from each of the university's general campuses. The institute's mission is to enhance understanding of the marine environment and human interactions with it by supporting research programs and stimulating interchange among the university's campuses. As part of its intercampus activities IMR conducts workshops on specialized topics and provides support for graduate students in ocean-oriented fields to study temporarily on a campus other than their home campus.

A major function of the institute is the administration of the California Sea Grant College Program. This program supports the work

of over fifty investigators on various campuses of the university and other academic institutions throughout the state, including traineeships for graduate students carrying out projects in all aspects of marine and coastal research.

Further information about the IMR inter-campus study program and Sea Grant traineeships can be obtained from the IMR director's office.

**Intercampus Institute for Research at Particle Accelerators (IIRPA)** is an inter-campus research unit established to facilitate the use of large national laboratory particle accelerator centers by individual University of California campuses. The principal activity at these particle accelerator centers is concerned with high-energy and elementary particle physics. Other disciplines are also finding more uses for the radiation from these accelerators, and hence the institute includes individuals engaged in biophysics research. There is at present no direct graduate program in the institute; however, graduate students in physics and biophysics can participate in the activity of the institute through their respective campus departments.

## CAMPUS-WIDE INSTITUTES

The **Biomedical Engineering Institute** was established in November 1991. The purpose is to provide an academic research unit for interdisciplinary interactions among UCSD faculty and students aimed at promoting and coordinating bioengineering research and education at the interface of engineering, biology, and medicine.

The research and training programs are related to medical problems such as cancer, diabetes, myocardial infarction, hypertension, atherosclerosis, pulmonary diseases, orthopedic disorders, and sports injuries. Engineering approaches are used to improve the understanding of these diseases, such that the physiological processes and their pathological deviations can be predicted with quantitative theories. The ultimate goal is to develop methods of prevention, diagnosis, and therapy. These research projects are briefly outlined under three headings.

*Cardiopulmonary bioengineering:* Biomechanics of normal and diseased hearts. Mapping of cardiac surface for diagnosis and treatment of arrhythmia. Microvascular dynamics; renal circulation, and sympathetic ner-

vous system in hypertension. Skin microcirculation, retinal microvasculature, endothelial transport of glycoproteins, and development of a glucose sensor in diabetes. Roles of lipids, lipoproteins, vascular endothelium, and anti-atherosclerotic agents in arteriosclerosis. Stress, growth, and remodeling of the cardiovascular system. Noninvasive diagnosis and natural history of peripheral arterial disease. Regulation, exchange, flow dynamics, and aging in the microcirculation. Physiological consequences of pulmonary diseases and responses of pulmonary circulation to hypoxia and weightlessness.

*Neuro-musculo-skeletal bioengineering:* Biomechanical and physiological bases of nerve development, nerve injury, ligament healing, joint contracture, muscle injury, cartilage allografts, and skeletal adaptation. Muscle growth and strengthening with electrical stimulation. Structure analysis of the retina.

*Cellular-molecular bioengineering:* Cellular mechanisms in immune responses. Production of monoclonal antibodies to tumor associated antigens and development of mass hybridoma cultures for producing antibodies. Biomechanical and molecular bases of cell adhesion, including the killing of cancer cells by cytotoxic lymphocytes. Molecular biology of membrane skeletal proteins as related to the microrheology of cells and hemolytic anemia. Membrane and protein traffic in normal and cancer cells. Regulation of gene expression. Roles of intracellular calcium ion and secondary messengers in cell functions and proliferation.

The **Institute for Neural Computation** has as its goals the understanding of how nervous systems function through direct observation, experimental investigation, and modeling of neural structures. It extends into the field of psychology, where it seeks to uncover cognitive principles through psychological experimentation and parallel-distributed processing models. It will apply these principles of neural computation toward the solution of diverse technological and scientific problems, particularly the building of a new generation of massively parallel computers. The institute is multidisciplinary, with founding members coming from both biological and social sciences as well as engineering. The research areas in which the institute has major projects include motor systems, visual processing, learning and memory, and language modeling.

The **Institute for Nonlinear Science (INLS)** promotes interdisciplinary research

and graduate education in the development and application of contemporary methods in the study of nonlinear dynamical systems. Using a common mathematical language, faculty and students from disciplines as diverse as cardiology, mathematics, oceanography, mechanical engineering, and economics pursue the implications of generic characteristics of nonlinear problems for their subjects. Each year the institute sponsors several long- and short-term senior visitors from the University of California and elsewhere and provides, through funds from external funding agencies, support for about twenty-five graduate students to work on Ph.D. dissertations concerned with nonlinear problems. Also associated with INLS are about ten postdoctoral fellows.

The core of INLS activities is composed of (1) joint research among faculty and students across disciplinary lines, (2) lecture series and working seminars designed to convey recent research progress and to stimulate new investigations. Through contracts with external agencies the INLS supports a major center in the experimental, numerical, and theoretical study of chaos and turbulence in fluid dynamics, investigations in nonlinear polymer science, studies (jointly with the University of California, Berkeley) in the nonlinear stability of fluids and plasmas, investigations of mathematical properties of quasi-conformal mappings, and work on the bifurcation of symmetric systems.

INLS has developed joint research programs with universities, research institutes, and commercial companies in areas of common interest. It actively works with colleagues at MIT and the University of Michigan, at Lockheed Sanders, Inc., Randle Corp., and Mission Research, and with the Institute for Applied Physics in Nizhny Novgorod. These affiliations provide new research horizons and realistic opportunities for technology transfer.

**Institute for Pure and Applied Physical Sciences (IPAPS)** is an interdisciplinary research unit which brings together members of departments in the sciences and in engineering, and Scripps Institution of Oceanography. The institute is concerned with fluids and materials. Specific subjects of research include superconductivity, ferromagnetism, semiconductor heterostructures, solid surfaces, plasma physics, hydromagnetics, turbulence, fluid mechanics, laser physics, and numerical analysis.

**Sam and Rose Stein Institute for Research on Aging** encourages interdisciplinary research into a wide range of phenomena and changes in body function associated with aging. These range from the basic nature of the biological process of aging to the clinical disorders that occur in greater frequency with advanced age. Alzheimer's disease, as the principal cause of senile dementia, has been designated for highest priority research, with special attention also to be given to arthritis, cardiovascular disease, and osteoporosis. The following program areas have been identified: immunology, arthritis and genetics; neurosciences; endocrinology and cell biology; atherosclerosis; clinical research; education (aging specific); psycho-socio aspects of aging; and human development and aging.

## CENTERS

The UCSD **Cancer Center (CC)**, active in the fight against cancer since 1978, is a National Cancer Institute-designated Clinical and Research Cancer Center. It has a triple mission of providing the highest quality conventional and experimental cancer care, defining and applying new knowledge concerning the mechanisms of cancer initiation and growth, and providing the medical and scientific community and the public with information concerning the causes, management, and prevention of cancer. Under the auspices of a Cancer Center Core Support Grant from the National Cancer Institute, there are six active program areas within the Cancer Center. These include biostatistics; cancer biology; pharmacology; basic and clinical immunology; cancer treatment, clinical trials research and education; and cancer prevention, epidemiology, and control. Shared resources at the Cancer Center include pharmacology, molecular biology and immunohistology core laboratories; a flow cytometry unit; a tissue bank and hybridoma production facility; a biostatistics unit; and a clinical trials office. Research and educational grants support the training of postdoctoral fellows and medical students. The Clinical Trials Office coordinates clinical research trials involving cancer patients at UCSD, and is the focal point for a large cancer Protocol Outreach Network which provides state-of-the-art protocol treatment opportunities for patients in a broad geographic area within Southern California. Patient care activities of the Cancer Center are located in the Combined Oncology Clinic at the Theodore Gildred Cancer Center Facility

and in the Inpatient Oncology Unit at UCSD Medical Center, both located at Hillcrest. Basic research activities of the Cancer Center are carried out both at the Theodore Gildred Cancer Facility and at the 303 Matthews Administrative and Academic Complex building on the La Jolla campus. Members, associate members, and affiliate members of the Cancer Center number in excess of 150 laboratory investigators and clinical physicians from eleven academic departments. The overall operating budget of the Cancer Center, including contracts, grants, foundation awards and individual gifts, exceeds \$11 million a year.

**Center for Astrophysics and Space Sciences (CASS)** is an interdisciplinary research unit established in 1979. The center brings together academic and research staff from the Departments of Physics, Chemistry, and Electrical and Computer Engineering. Research is conducted in the scientific areas of theoretical astrophysics; infrared, optical, and ultraviolet astronomy; solar observational and theoretical studies; X-ray and gamma-ray astrophysics; astronomy; solar, magnetospheric and space plasma physics; radio astronomy and cosmochemistry, including the chemistry of interstellar matter. CASS provides a jointly shared facility which has office, laboratory, and

computer space to enhance the interchange of expertise. Researchers in CASS have access to many University of California observing facilities, and have contributed experiments to many major NASA space missions.

The center's facilities, faculty, and research staff are available to graduate students in the Departments of Physics, Electrical and Computer Engineering, and Chemistry who have chosen to write their dissertation on subjects of research encompassed by CASS. Graduate and undergraduate courses in astrophysics, astronomy, and space sciences are developed and taught by the academic staff of CASS.

The Marlar Foundation provides several enhancements to the academic program, including a fellowship to an outstanding senior graduate student, and funding for a yearly public lecture given by an eminent astrophysicist.

CASS has about sixteen faculty associates, twenty-six Ph.D. research staff, eighteen graduate students in physics and ECE, and about fifty support personnel. The total yearly budget is about \$10 million, mostly from federal funding sources.

The **Center for Energy and Combustion Research (CECR)**, in 1986, replaced and encompassed the **Energy Center**, which was





formed in 1972-73 with initiation of graduate research programs and graduate and undergraduate courses on energy production, utilization, conservation, environmental impacts, and policy. Current research directions include energy research as well as combustion science and evaluations of environmental impacts associated with fossil-fuel utilization. These interdisciplinary studies involve faculty members from several UCSD departments and SIO. A limited number of graduate research assistantships is available. Applications for graduate study in any of the disciplines covered by CECR should be directed to the chair of the academic department in which graduate study is to be undertaken.

**Center for Human Information Processing (CHIP)** provides facilities for visiting scholars and research. Associated laboratories undertake psychological and interdisciplinary projects in the areas of perception, psychophysics, cognitive development, psycholinguistics, attention, memory, detection theory, judgment and choice, information integration, and cognitive functions. The work of the center concentrates on theoretical and research projects, postdoctoral studies, workshops, conferences, and discussion groups.

**Center for Iberian and Latin American Studies (CILAS)** coordinates and promotes Latin American and Iberian research, teaching, and service activities for faculty and students in all departments at the university. It sponsors multidisciplinary colloquia, conferences, projects and publications, as well as library expansion and outreach efforts. The center also hosts visiting faculty, films, and performances. It awards fellowships each year to the most promising graduate students. The U.S. Department of Education has designated CILAS, in consortium with the Latin American Center at San Diego State University, as a National Resource Center for Latin American Language and Area Studies.

The **Center for Magnetic Recording Research (CMRR)**, founded in 1983, is a national center devoted to multidisciplinary teaching and research in areas of science and engineering related to magnetic recording. As part of its mission to educate future leaders in this vital technology, the center, in cooperation with the Departments of Physics, Chemistry, Computer Science and Engineering, Electrical and Computer Engineering, and Applied Mechanics and Engineering Sciences, offers

classes at both the undergraduate and graduate levels in order to expose students to the concepts of magnetic recording and encourages graduate-level study. In addition, the center assists in the continuing education of professionals already in the field through workshops and seminars. CMRR also stimulates and supports research related to magnetic recording, especially the development of techniques to increase the storage capacity of magnetic recording devices.

**Center for Molecular Genetics (CMG)** promotes molecular genetic research and the training of graduate students and postdoctoral fellows in the biological and biomedical sciences. The latest techniques of gene isolation, gene manipulation, including the control of gene expression, and the genetic transformation of cells and organisms are both further developed and applied to major problems in biology and medicine. Current research and instructional programs are in the fields of developmental biology, human heredity, immunology, molecular neurobiology, plant molecular biology, and applied microbiology.

The center serves as a resource for the entire campus for molecular genetic techniques, materials and facilities, and encourages interactions with other organized research units in the biomedical area.

The **Center for Research in Computing and the Arts (CRCA)** exists to foster collaborative working relationships among artists, scientists, and technologists by identifying and promoting projects in which common research interests may be advanced through the application of computer-mediated strategies.

In this context, "artist" is understood to include, but not be limited to, practitioners and theorists in architecture, dance, literature, music, poetry, theatre, and the visual arts. "Scientists and technologists" are similarly understood to include researchers in cognitive science, computer science, engineering, linguistics, mathematics, physics, and psychology.

The center has two closely related goals. One is the discovery, evaluation and development of new conceptual modes, drawing on the most productive aspects of the intellectual disciplines of all its members. The other is to further the aims of the arts, science, and technology through the exploration of ways in which the expanding bodies of knowledge invested in each can be used to promote the aims of the others. Research conducted under

the auspices of the center is intended to challenge and expand conventional categories under which the results of artistic, scientific, and technological pursuits are understood.

**Center for Research in Language (CRL)**. The foci of the center are on processing models of language understanding, first and second language acquisition, and neuro-linguistics. Research in the center is interdisciplinary and draws upon the fields of linguistics, psychology, cognitive science, neurosciences, computer science, sociology, and anthropology.

The center's facilities are designed to accommodate laboratory research projects by the faculty and graduate students; facilities include a number of high-performance work stations, a Transputer laboratory, extensive equipment for audio recording and analysis, and equipment for psycholinguistic experimentation.

Current research projects include development of neurally inspired parallel processing model of speech perception; studies in first language acquisition; cross-linguistic comparisons of the process of language acquisition and aphasia; the psycholinguistic characterization of the process of acquisition of sign language by deaf children and of other gestural communication; study of tone sandhi across certain Chinese dialects; research on the integration of grammatical analyses and theories; the compilation of a comparative dictionary of the Yuman languages, and the compilation of an Albanian-English dictionary. The center administers a neural networks training program sponsored by the MacArthur Foundation. This program provides training for developmental psychologists in network modelling techniques. CRL has entered into an institutional agreement with the Istituto di Psicologia of the Italian National Council for Research, Rome. This agreement provides for the exchange of personnel and support for projects of mutual interest. An ongoing speaker series presents a broad range of experimental approaches to the study of language. The center publishes a monthly newsletter.

The **Center for U.S.-Mexican Studies (CMS)**, established in 1979, is the nation's largest program devoted exclusively to the study of Mexico and U.S.-Mexican relations. It combines research in all of the social sciences and history, graduate and undergraduate student training, continuing professional education, publications, and public education activ-



ities that address the full range of problems affecting economic and political relations between Mexico and the United States. The center also studies the history, economy, political system, and social structure of Mexico; aspects of the U.S. economy and U.S. public policy that affect Mexico; and Mexico's economic interactions with Japan and other Pacific Basin countries.

Through its program of visiting research fellowships, the center each year sponsors the research of twenty to twenty-five predoctoral and postdoctoral scholars, and nonacademic specialists, who spend three to ten months in residence at the center. Typically, people from Mexico receive over half of these fellowships, which are awarded through an open, international competition. Other visiting fellows come from Europe, Canada, Latin America, and the Far East. The center's permanent academic staff also conducts long-term studies of political change in Mexico, agricultural reform in Mexico, Mexican migration to the U.S., domestic interest group politics on U.S.-Mexican relations, Japanese investment in Mexico, and economic integration of Mexico, Canada, and the United States. The center publishes much of the research conducted under its auspices.

Each summer, in collaboration with UCSD's American Political Institutions Program, the center conducts a seven-week seminar in studies of the United States, for twenty Latin American social scientists and nonacademic professionals.

The center's interdisciplinary Seminar on Mexico and U.S.-Mexican Relations, which meets weekly throughout the academic year, and its research library attract leading researchers from throughout the United States, Mexico, and other countries. In addition, several research workshops on specialized subjects are held each year.

The center has a very active public education program, which includes frequent briefings for journalists, business executives, public officials, and community groups.

## LABORATORIES

The **Laboratory for Mathematics and Statistics (LMS)** promotes collaborative research in applied mathematics and statistics. Its members, most of whom belong to the Department of Mathematics, have carried out joint efforts with researchers of the UCSD Cancer Center, the Department of Applied Mechanics and Engineering Sciences, the Depart-

ment of Economics, the Department of Biology, the Scripps Institution of Oceanography, the Pulmonary Program Project, the Specialized Center for Research on Ischemic Heart Disease, the UCSD Medical Center Regional Burn Center, the Salk Institute, and the HIV Neuropsychiatric Research Center. This research has involved the analysis of time series; the fitting of various models in cell kinetics, neurophysiology, pharmacokinetics, and pulmonary physiology; econometric analysis, the study of gain equalization for amplifiers; the estimation of human risk from suspected environmental carcinogens; computer-aided diagnosis and prognosis in medicine; and various aspects of AIDS research, in particular the analysis of irregular multivariate repeated measures arising in cohort studies on its natural history and epidemiology.

## PROJECTS

The **American Political Institutions Project (APIP)** was established in 1989 as a center for research and public education on American politics and public policy. Composed of faculty from the Departments of Political Science, Economics, History, Communication, Sociology, and the UCSD Library, the project's primary mission is to stimulate cross-disciplinary research. To this end, APIP sponsors lunch-table seminars and research conferences and assists scholars in identifying external sources of support, as well as preparing research proposals.

Recognizing the vital role of the university in civic education, the project has also initiated a series of public affairs programs for the campus and surrounding communities. In late 1991, APIP co-organized the third in a series of national affairs symposia at UCSD. These highly successful conferences focused upon different aspects of the presidency and resulted in critically acclaimed books as well as national public television specials, the second of which received an Emmy nomination for the best news interview program.

APIP's collaboration with UCSD's Center for U.S.-Mexican Studies continued in 1991 with the organization of the third annual summer seminar for Latin American scholars and professionals. This six-week program introduces participants from several Latin American nations to the most recent research on U.S. politics, economics, and history and also provides training in survey research and policy analysis.

APIP currently is co-establishing a survey research facility that will begin its operation in the fall of 1992 with a San Diego-based survey on current political issues.

The **Project in AIDS Research**, established in 1988, is designed to provide a forum for discussion of research in AIDS at the basic and clinical levels. It is hoped that the Project in AIDS Research will provide for planning of collaborative projects, and for education of predoctoral and postdoctoral scholars in AIDS research. Grants have been awarded to support a training program of postdoctoral fellows. A seminar series and other activities have been initiated to facilitate interaction among faculty from over six departments and three geographic locations. This project provides a possible basis for the development of an organized research unit at some future time when a larger basic research program in AIDS has been developed.

The **Project in Cognitive and Neural Development**. The purpose of the UCSD Project in Cognitive and Neural Development is to provide a forum for interdisciplinary research on brain and cognition in human children, including research on the neural bases of language and communication. The project brings together faculty and research staff from the UCSD Departments of Cognitive Science, Communication, Linguistics, Neurosciences, Psychology, Psychiatry and Sociology, the San Diego State University Departments of Psychology and Communication Disorders, the Salk Institute for Biological Studies, and Children's Hospital Research Center.

The **Project in Conservation Science**, established in December 1987, is the planning stage of a proposed international Center for Conservation Science. The project addresses the urgent need to improve the scientific basis of species and community conservation, habitat restoration, and natural resource management for sustained development. Coordinated by ecologists and geneticists in the Department of Biology, the participants also include researchers in the Department of Anthropology, the School of Medicine, Scripps Institution of Oceanography, the National Marine Fisheries Service Laboratory, and the Center for the Reproduction of Endangered Species at the San Diego Zoo. Existing linkages between local participants and field research and training programs in Montana, U.S.A., Kenya, Thailand, and several other countries are being

strengthened and, in some cases, institutionalized. The project will seek ways to foster the further development of local and international research, educational, and training opportunities.

The **Project in Geometry and Physics (PGP)**, established in 1987, provides opportunities for increased collaboration among mathematicians and physicists.

The **Structural Systems Research Project (SSRP)** promotes research and graduate education in the development of contemporary methods for the design and analysis of large-scale civil, aerospace, geo-, and ocean-based structures. The research team, which includes participants from the university and industrial institutions on a national basis, incorporates individuals with expertise in large-scale experimental testing, theoretical modeling, numerical algorithms and computer code development, interactive experimental techniques, data processing, limit state design, and optimal design.

The core of the project is the Charles Lee Powell Structural Systems Laboratory. This facility is the largest structures laboratory in the United States. It features a fifty-foot-high reaction strong wall for the testing of up to five-story full-scale buildings and other structural systems. When combined with an extensive closed loop-servo controlled hydraulic system and the Cray supercomputer, which is hard-lined to the facility, *interactive* experiments may be performed wherein actual dynamic environments are simulated. One such case involving the nonlinear response and damage evolution of a five-story structure to critical seismic excitations is currently in the development stage as part of a U.S.-Japan cooperative program in earthquake engineering. Research projects with CALTRANS on bridge rehabilitation and seismic retrofitting are in progress. Offshore structural systems research with the National Sea Grant Office and several oil companies is in progress on strength assessment and retrofit of damaged platform members. Aerospace-related research for NASA and NSF involves the development of aeroelastically tailored helicopter, tilt-rotor, and turbopropeller blades composed of advanced composite materials and the development of hybrid-damped composite structures using passive and active techniques.

The **Water Research Project (WRP)**, established in 1988, exists to promote research

in basic scientific and technological fields related to water as a natural resource, and to facilitate and develop the transfer of research ideas and results to the realm of technology and practical applications. Water research is a vast area encompassing many disciplines. The main effort at present is concentrated in three thrust areas where UCSD has particular research strengths. These are: (1) *Fluid mechanics*, including aspects of coastal oceanography and applications in chemical, mechanical, and civil engineering science; (2) *Chemistry*, including aspects of geochemistry, in particular the physical chemistry of water and aqueous solutions and water/solid interaction processes; (3) *Biology*, including biotechnology applications involving genetic engineering and the dynamics of natural and artificial ecosystems. Some thirty faculty and researchers participate in the project, including investigators from systems science, economics, and the health sciences.

## NATURAL RESERVE SYSTEM (NRS)

The **Natural Reserve System (NRS)** was founded to establish and maintain a system of natural land and water areas as samples of the diversity of California's terrain. These reserves are used for teaching and research in all disciplines, from geology and environmental sciences to anthropology and art. Faculty and students of the University of California and other institutions are encouraged to use any of the thirty reserves in the system for serious academic pursuits. Further inquiries can be directed to Dr. Paul Dayton, chair of the UCSD NRS advisory committee, 534-6740, or to Ms. Isabelle Kay, academic coordinator, 534-2077. The San Diego campus administers the following four reserves:

**Dawson Los Monos Canyon Reserve:** This 200-acre reserve is located on the outskirts of the city of Vista in north coastal San Diego County. Its young, stream-cut valley contains a year-round creek with precipitous north- and south-facing slopes. The major habitat types are Southern Riparian Woodland, Diegan Coastal Sage Scrub, Perennial Coastal Stream, Coast Live Oak Woodland, Mixed Grassland of native bunchgrass and introduced annuals, and South Coastal Mixed Chaparral. This area is also of unique and significant historical and archaeological value,

and extensive records are available for this reserve.

**Elliott Chaparral Reserve:** Located a short distance to the east of campus, this 107-acre reserve, adjacent to the large expanse of Miramar Naval Air Station that is undeveloped, features Chamisal Chaparral typical of the Southern California coastal plain. It is readily available during a normal three-hour lab period or for term-paper-length field studies as well as for more lengthy projects.

**Kendall-Frost Mission Bay Marsh Reserve:** This twenty-acre reserve is the last tidal salt marsh on Mission Bay and one of the few remaining in Southern California. It provides habitat for two rare and endangered birds, the light-footed clapper rail and the Belding's savannah sparrow. An on-site trailer houses limited laboratory facilities, and extensive facilities exist across the Bay at Hubb's Sea World.

**Scripps Coastal Reserve:** This reserve consists of disjunct shoreline and cliff-top (or "knoll") portions. The shoreline part consists of sixty-seven acres extending seaward 1,000 feet from the beach which were granted to the university by the state legislature for scientific purposes. Surrounding the Scripps Pier, habitats include sandy beach and submerged plain, seasonally exposed cobble beach, rocky reef, pier pilings, and upper submarine canyon ledges. Habitats of the cliff-top knoll and canyons include coastal sage and desertic maritime scrubs, sea bluff succulent scrub, and disturbed grassland. This reserve is enhanced by the availability of the laboratories and facilities of nearby Scripps Institution of Oceanography and the main San Diego campus.

## CAMPUS-WIDE RESEARCH FACILITIES

### INSTRUCTIONAL COMPUTING CENTER

See page 95.

### SAN DIEGO SUPERCOMPUTER CENTER

See page 98.

### THE UNIVERSITY LIBRARY

See page 100.

## THE SCHOOL OF MEDICINE

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The School of Medicine's unique interdisciplinary approach to medical education enables students to benefit from a diversity of laboratory facilities, clinical opportunities, and faculty talent and knowledge. The founders of the School of Medicine and the UCSD general campus stressed a close interdisciplinary cooperation between and within the units; thus teaching and research are well integrated on this campus. The medical school faculty includes scientists from the campus Departments of Applied Mechanics and Engineering Sciences, Biology, Chemistry, Mathematics, Sociology, and the Scripps Institution of Oceanography. The medical school curriculum is broadened by the contributions of these faculty members on interdisciplinary course committees, emphasizing the facets of their disciplines which closely relate to medical education. Another feature of the School of Medicine's curriculum is its emphasis on the human being as an inextricable part of the social milieu. All instruction in medicine and related

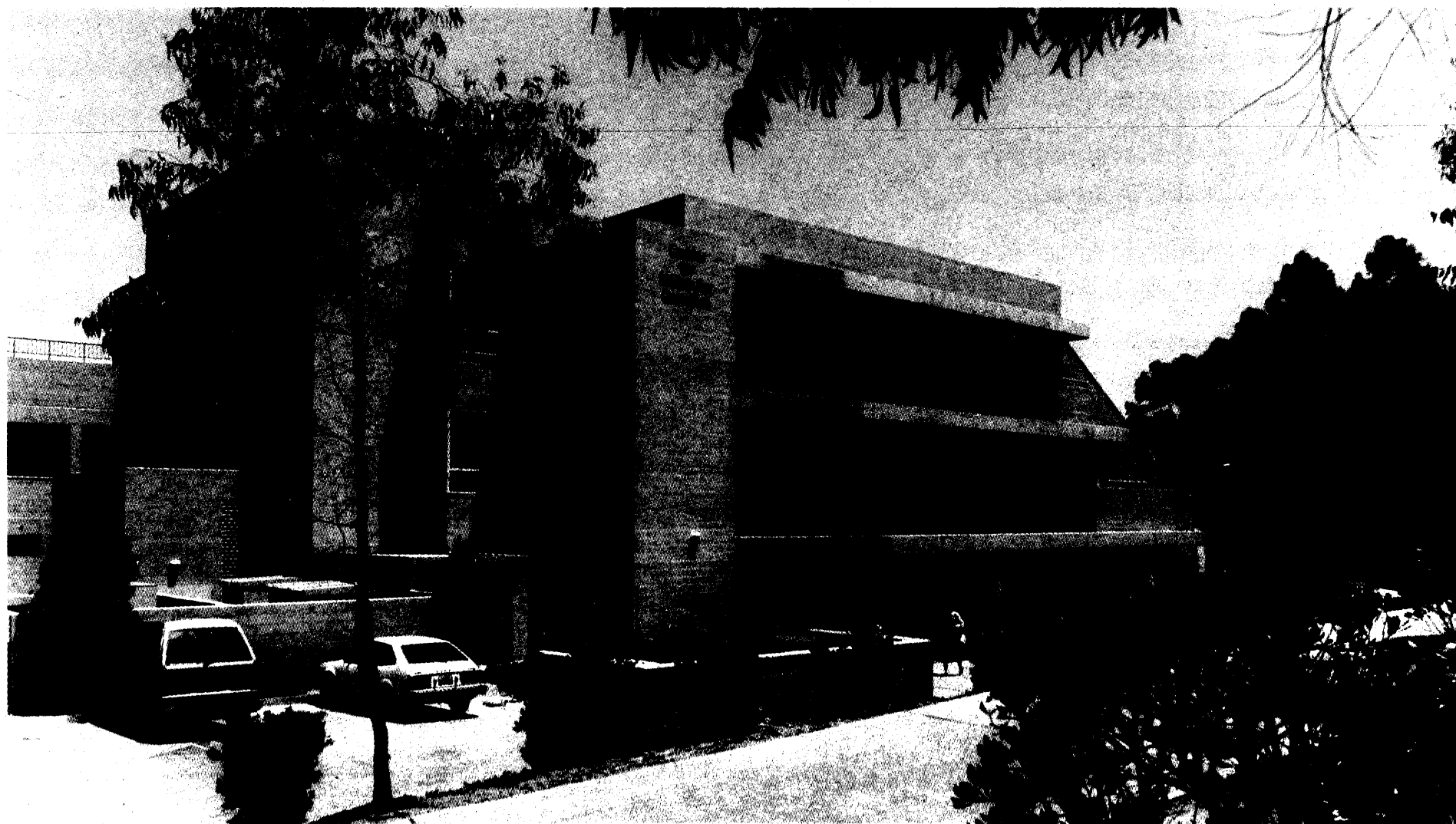
sciences considers humans not merely as physical organisms, but as persons who exist in a complex physical, social, and psychological environment.

The settings for clinical instruction and experience comprise a variety of hospitals and clinics ranging from UCSD Medical Center and county urban areas to rural, outlying facilities. These affiliated hospitals and clinics include the UCSD Medical Center with 459 beds and a variety of outpatient clinics; the 606-bed Veterans Administration Medical Center adjacent to the La Jolla campus; the 560 acute care- and 200 ambulatory care-bed Naval Hospital, which is the largest military medical complex in the United States, and eight other affiliated medical facilities. Major instructional and research buildings are located on the campus health sciences complex and at the UCSD Medical Center.

The goal of the medical curriculum clinical experience and faculty-student interactions is to develop well-trained, objective, and con-

scientious physicians prepared for the changing conditions of medical practice and continuing self-education. Students acquire understanding of the basic medical sciences and clinical disciplines, and are encouraged to choose their own specialized areas of interest for eventual development into careers in the broadly diversified medical community. All students have access to the best facilities and personalized counseling. The curriculum provides flexibility; form and content, in part, are adapted to the individual needs and goals of each student.

The curriculum is divided into two major components: the core curriculum and the elective programs. Elective opportunities constitute nearly one-fourth of classes during the first two years and more than one-third during the last two years. The core curriculum includes those aspects of medical education deemed essential for every medical student regardless of background or ultimate career direction. The integrated core curriculum of the first two



years is designed to provide each entering student an essential understanding of the fundamental disciplines underlying modern medicine. The core curriculum of the last two years is composed of the major clinical specialties taught in hospital settings, outpatient situations, and relevant extended-care facilities. A Medical Scientist Training Program provides the opportunity for a limited number of students to earn both the M.D. and Ph.D. degree over a six- to seven-year period of study.

Each student is expected to develop an individualized program of independent study in conjunction with a faculty member and to describe it in writing. Students are graded on an Honors/Pass/Fail system for required courses. The Honors grade is not used to numerically rank the class, but is used to acknowledge students who have demonstrated superior academic performance. Elective courses are graded on a Pass/Fail system. Students receive written individual evaluations by the faculty.

The School of Medicine enrolled its charter class of undergraduate medical students in September 1968. Freshman student enrollment is 122, and a total of 515 medical students were enrolled in 1991-92.

### **SELECTION FACTORS**

Selection is based upon the nature and depth of scholarly and extracurricular activities undertaken, academic record, performance on the MCAT, letters of recommendation, and personal interviews.

The Admissions Committee gives serious consideration only to those applicants with GPA values and MCAT scores above average. The School of Medicine is actively recruiting minority students who have shown determination to pursue careers in medicine and who have demonstrated personal promise for becoming dedicated physicians.

A complete catalog and information on the foregoing programs are available upon request.

Write or call:  
The Office of Admissions  
School of Medicine, 0621  
University of California, San Diego  
9500 Gilman Drive  
La Jolla, California 92093-0621  
(619) 534-3880

### **PROGRAMS FOR PROSPECTIVE MEDICAL STUDENTS**

UCSD offers no special premedical major. An undergraduate student considering medicine as a career may choose any major or concentration area leading to the bachelor's degree, provided that he or she elects those additional courses which the medical school of his or her choice may require for admission. Admission requirements differ among medical schools, but most desire a solid foundation in the natural sciences—biology, chemistry, physics, mathematics—and a broad background in the humanities, social sciences, and communication skills. A premedical/dental advisory program is available through the campus-wide Career Services Center.



# SCRIPPS INSTITUTION OF OCEANOGRAPHY

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Scripps Institution of Oceanography is one of the oldest, largest, and most important centers for marine science research, graduate training, and public service in the world. Its preeminence in the marine sciences is reflective of its excellent programs, distinguished faculty, and outstanding facilities.

In all, Scripps occupies sixty-five buildings on 230 acres along the Pacific coastline below the mesa on which UCSD is located. Its staff numbers approximately 1,200, including approximately 190 graduate students. The institution's budget is approximately \$70 million annually.

Scripps Institution was founded in 1903 as an independent biological research laboratory, which became an integral part of the University of California in 1912. At that time the laboratory was given the Scripps name in recognition of Ellen Browning Scripps and E.W. Scripps.

Research at Scripps encompasses physical, chemical, biological, geological, and geophysical studies of the oceans. Ongoing investigations include the topography and composition of the ocean bottom, waves and currents, and the flow and interchange of matter between seawater and the ocean bottom or the atmosphere. Scripps's research ships are used in these investigations throughout the world's oceans. Among the more than 250 programs that may be under way at any one time are studies of air-sea interaction, climate prediction, earthquakes, the physiology of marine animals, marine chemistry, beach erosion, the marine food chain, the ecology of marine organisms, the geological history of the ocean basins, and the multidisciplinary aspects of global change and the environment.

Scripps operates four ships and two platforms for oceanographic research primarily in support of programs by Scripps researchers, although a significant part of their work is for oceanographers from other institutions throughout the world. Cruises range from local, limited-objective trips to far-reaching expeditions in the world's oceans.

Investigations supported by contracts and grants, primarily federal, cover a wide latitude of marine research. The general research effort is conducted by five divisions: Climate Re-

search Division, Geological Research Division, Marine Biology Research Division, Marine Research Division, and Physical Oceanography Research Division. The diversity of Scripps's work is extended by two special purpose laboratories: the Marine Physical Laboratory and the Physiological Research Laboratory. Other specialized groups also are located on campus: the Center for Coastal Studies and the Marine Life Research Group. A ship operations and marine technical support unit provides essential services and facilities to all research units of the institution.

Scripps's educational program has grown hand in hand with the research programs. Instruction is on the graduate level, and students are admitted as candidates for the Ph.D. degree. Academic work is conducted through an organizational segment of the institution known as the Graduate Department of SIO and its seven curricular groups: biological oceanography, physical oceanography, marine biology, geological sciences, geochemistry/marine chemistry, geophysics, and applied ocean sciences. Approximately eighty professors are complemented by an academic staff of more than 100 research scientists, many of whom have a regularly scheduled role in the instructional program.

The Scripps Aquarium-Museum provides a wide variety of educational courses in the marine sciences for students from primary grades to high school level. UCSD students also may become involved in work-study programs or serve as volunteers or aquarist trainees. A limited number of students can be accommodated for a four-unit course in independent study by arrangement with a faculty member and the aquarium-museum director. The facility's resources include natural habitat groupings of marine life from local and Gulf of California waters; many of these marine groups are on display in the aquarium. The museum exhibits present basic oceanographic concepts and explain research undertaken at Scripps. The aquarium-museum is open from 9:00 a.m. to 5:00 p.m. daily. A new aquarium-museum will open in 1992.

The La Jolla Laboratory of the University of California's Institute of Geophysics and Planetary Physics, UC's California Space Institute,

and UC's Institute of Marine Resources (IMR), although organizationally separate, are closely affiliated with Scripps. In addition to its regular research programs, IMR administers the California Sea Grant College Program, with more than forty projects and approximately forty-five trainees supported on California campuses and in several specialized research units, including the Food Chain Research Group. The Southwest Fisheries Center (SWFC), located near the Scripps campus, is one of thirty major laboratories and centers operated by the National Marine Fisheries Service, a component of the National Oceanic and Atmospheric Administration of the U.S. Department of Commerce. Also, SWFC is the headquarters for the Inter-American Tropical Tuna Commission.

Students enter oceanography with extremely varied interests and backgrounds—naturalists, explorers, engineers, and theorists from the United States and from many foreign countries. One thing they have in common, however, is that they come to Scripps with a very strong understanding of science. Most students select positions as research assistants when they enter the program—a practice that not only gives them an early involvement with research, but also provides salaries. The student-faculty ratio at Scripps is about two-to-one; consequently, classes are small, and the student has the opportunity to work closely with his or her thesis adviser. Oceanography is an interdisciplinary field that allows for informal exchange and interaction on a variety of levels.

While at Scripps, students have for their use some of the nation's most sophisticated and complete special laboratories and facilities for oceanographic studies covering a wide range of disciplines from biology and physiology to geophysics and atmospheric sciences. A hydraulics laboratory features a unique ninety-foot stratified wave-and-current channel, and an analytical facility has a host of scanning electron microscopes and other high-precision instruments. The Satellite Oceanography Center enables researchers to receive and process satellite imagery from earth-orbiting satellites. Among the many computer resources is the Scripps Supercom-



## SCRIPPS INSTITUTION OF OCEANOGRAPHY

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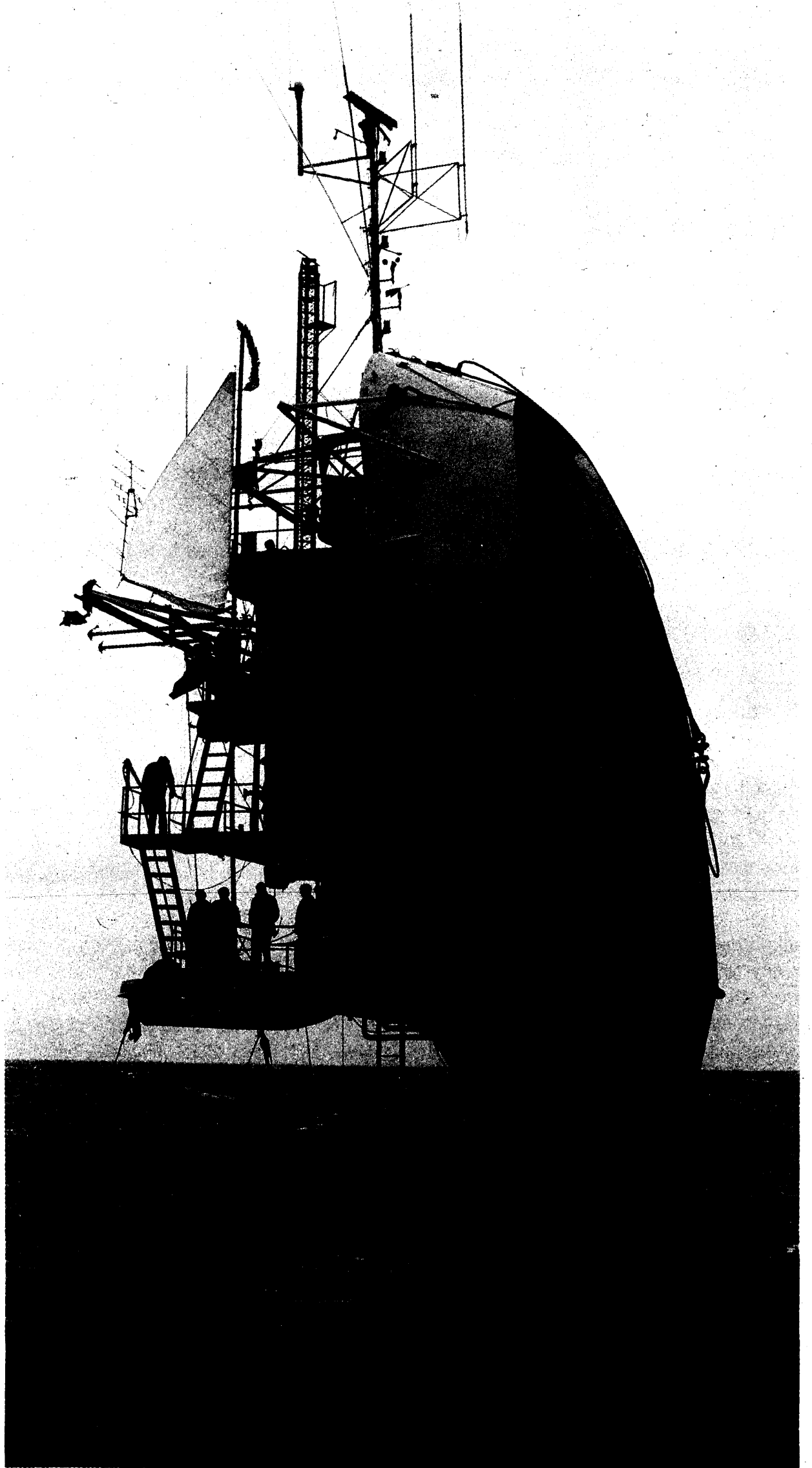
puter Users Remote Facility, which provides access to the San Diego Supercomputer Center through a high-speed link. The Scripps Library is the University of California's major collection of marine science materials, with outstanding collections in oceanography, marine biology, and marine technology. It also specializes in atmospheric sciences, fisheries, geology, geophysics, and zoology. The various marine life and geological specimens housed at Scripps form a vast "library" of oceanographic resources available for investigations. Two underwater research areas that are part of the UC Natural Reserve System are adjacent to the Scripps campus. During a student's tenure at Scripps, he or she will have the opportunity to go to sea on any of Scripps's four research vessels as well as those from other oceanographic institutions.

The combination of the large scientific staff and extensive facilities at Scripps provides an extraordinary opportunity for each student to enjoy close contact with existing oceanographic concepts and active participation in research.

See "Scripps Institution of Oceanography" in "Courses, Curricula, and Programs of Instruction" for further details on study programs, requirements, degrees, and courses.

For additional information, write:  
Graduate Student Information  
Scripps Institution of Oceanography, 0208  
University of California, San Diego  
La Jolla, California 92093-0208

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# GRADUATE SCHOOL OF INTERNATIONAL RELATIONS AND PACIFIC STUDIES

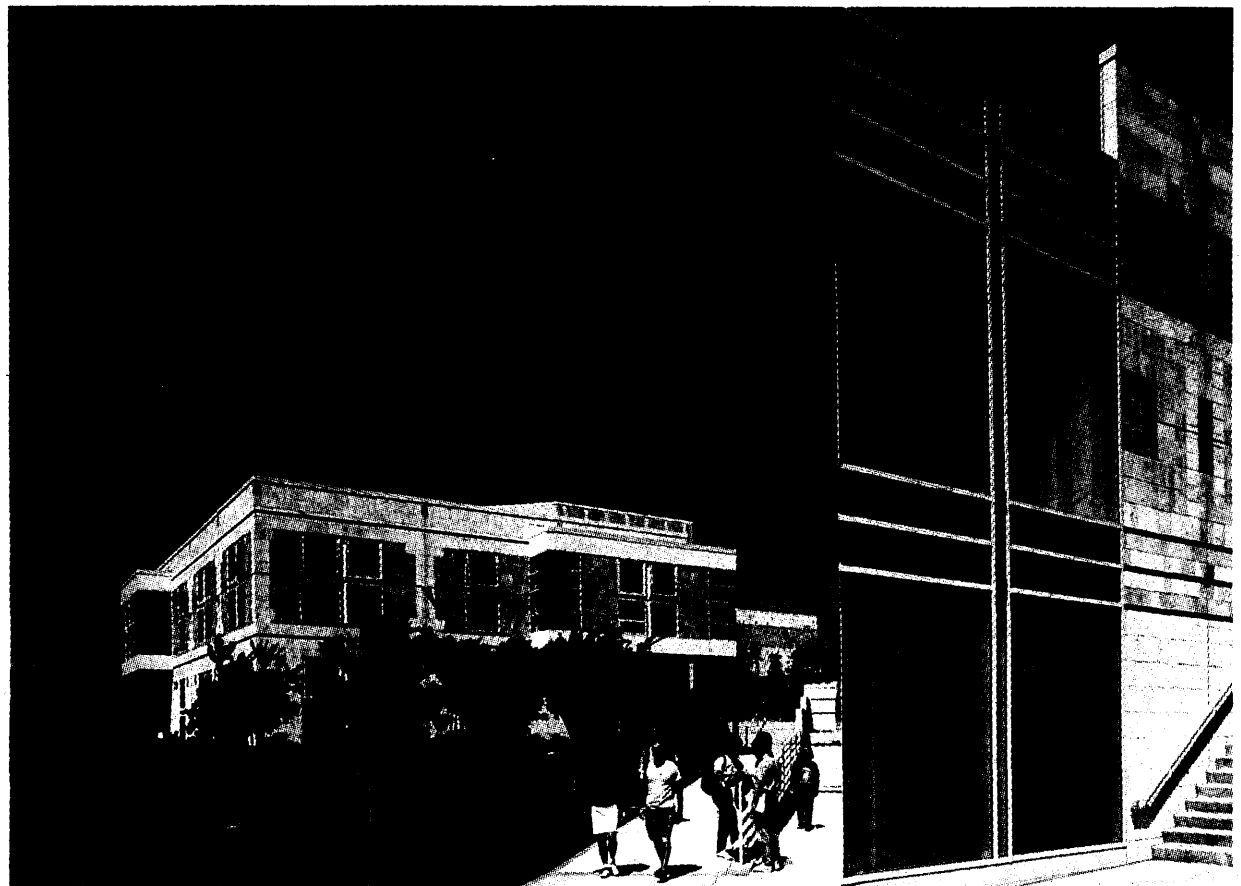
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The Graduate School of International Relations and Pacific Studies (IR/PS), University of California, San Diego was created by the Board of Regents in 1986 as the University of California's first professional school of international affairs. The school's regional focus is on the Pacific Rim, which extends from the southernmost tip of Latin America northward, across the United States and Canada, down through the Soviet Union, Japan, China, Korea, the Philippines, Australia, New Zealand, and the other nations of Oceania.

The school's programs have been developed in response to the increasing participation of the United States in global economic and political affairs. The United States wields less economic and political influence than it did in the immediate postwar years; at the same time, American industries face increasing competitive pressures in domestic and international markets. As a result, professionals who can understand and work in an internationalized environment are needed in both the public and private sectors. Moreover, while the United States once looked primarily to Europe as the site of its major commercial, financial, and strategic interests, the United States now has large stakes in the Pacific Basin, a likely source of both our greatest national challenges and possibilities in the next decades. These changes create both a need and an opportunity: a need for new programs of training and research in international affairs and an opportunity for a new school of international affairs and management to develop a distinctive, modern program that links professional training with international competence and gives greater prominence to the Pacific Basin.

The school's primary objectives are to prepare students with an interest in the Pacific Rim countries for positions of leadership in business, government, journalism, diplomacy, public service, and other fields; to serve as a center of excellence for research on economic, political, social, technological, and security issues confronting those nations; and to promote dialogue on Pacific region issues of common concern.

1. The degree programs provide students with professional training for careers in international affairs and management, including jobs



in industry, government, international organizations, foundations, schools, and research institutes. Whatever their specific goals, students receive a broad training across professional areas so that those headed for the government have a grasp of decisions in the private sector and those planning business careers acquire a grasp of decision making in public organizations. A program combining applied social science and professional subjects with courses on Pacific region countries provides students with both general skills and particular knowledge of the history, culture, language, and contemporary situations of those countries.

2. The school serves as a center for research on issues of common concern to the nations of the Pacific Rim. Since the Pacific Rim countries have become important foci of economic and security relations, the need for information and research centered on this dynamic region has become urgent. The diversity of national experiences represented by the Pacific region countries suggests a research agenda that includes comparisons of different approaches to economic management, foreign relations, policymaking, and development.

3. As part of the University of California, the school plays an important role in developing public awareness and understanding of the Pacific region. Programs of public outreach contribute to the information available to citizens and specialized groups about international issues that affect their lives.

## ***DEGREE PROGRAMS***

The degrees offered by the school include a professional master's degree in Pacific international affairs (M.P.I.A.) and a doctor of philosophy in international affairs. Training emphasizes international relations, economics and management, knowledge of specific countries or regions, analytical and research skills, and foreign language.

Mid-career and other professional development certificate programs are also offered by IR/PS. In particular, the International Career Associates Program (ICAP) is designed for working professionals seeking additional study in international management, international relations, and comparative public policy. Participants in the program spend an academic year at IR/PS beginning in mid-September and ending in mid-June. Under the auspices of the program, associates have the opportunity to

further internationalize their knowledge and experience as well as enhance their professional development in such areas as finance, accounting, quantitative methods, econometrics, and long-range strategic planning. The program of study is tailored to individual interests under the guidance of the program's director and faculty advisers.

The M.P.I.A. program is distinctive in several respects. The program:

1. Exposes students to the perspectives of both private business and public policymaking.
2. Offers specialized training in economics, management, international relations, and political analysis and integrates the languages, history, and cultures of the Pacific region into the curriculum.
3. Creates a laboratory for comparative analysis of economic management, foreign relations, policymaking, and development in the diverse countries of the Pacific region.
4. Offers language skills training necessary for international affairs professionals specializing in Pacific Rim countries.

The Ph.D. program offers a program of study that assures competence in students' major field, in their minor field, and in Pacific region policy issues. Major and minor fields are selected from international relations, international economic policy and management, and comparative policy analysis.

1. Major field: Students must acquire superior knowledge of the literature of the major field and develop research skills needed to do advanced work in their field;
2. Minor field: Students must acquire substantial knowledge of the literature of the minor field and develop some ability to bring that knowledge to bear in research activities;
3. Pacific region policy issues: Students must further develop substantial ability to analyze comparatively the policy issues of the Pacific region and to understand the historical and cultural roots of these issues.

Ph.D. students will be required to demonstrate knowledge of advanced quantitative methods or a foreign language, depending on individualized courses of study.

The master's and Ph.D. programs are distinct and separate. There is little overlap in the structure or requirements of the two programs because their objectives are very different. The master's program provides professional train-

ing for graduates who will pursue international careers in business, government, journalism, and other fields. The Ph.D. program offers an interdisciplinary academic education to a small number of students who will pursue international careers requiring advanced research capabilities in universities, corporations, government agencies, consulting firms, or other research organizations.

The master's and Ph.D. programs do share a common intellectual framework. Both the professional master's curriculum and the academic Ph.D. curriculum are designed to bring the theories, methods, and insights of various disciplines together to analyze policy issues of the Pacific region and to blend the perspectives of public policymakers and private managers. Despite these differences, the same faculty will teach and advise students in both the master's and Ph.D. programs.

### **THE FACULTY**

The school has attracted an interdisciplinary faculty from such fields as economics, linguistics, management sciences, international relations, comparative politics, and public policy. The various programs draw upon and contribute to research which focuses on the regions of the Pacific Rim and on major issues that affect the region.

The school places special emphasis on research in and teaching of topics of particular importance to the program. These topics currently include:

1. The Pacific Rim as system, including the interaction of the countries and regions within it (e.g., Latin American-Japanese economic relations, U.S. relations with both East Asia and Latin America, and the placement of the Pacific in the global system of international relations, both contemporary and historical).
2. Studies in international economics, management, and finance, including such subject areas as international competition, comparative industrial organizations, international trade and development, industrial relations, technological innovation, international financial structures, policies, institutions, and historical patterns of development.
3. Comparison of the trajectories of socio-economic development among the countries of Asia and Latin America, including the exploration of differences and similarities in state-society relations, culture, entrepreneurship, link-

age to the global economy, and geopolitical position.

4. Comparative analysis of patterns of policymaking in the countries of the Pacific region to understand how different governmental structures, economic systems, and social group interests shape the policy process and influence policy choices in such areas as budget allocation, regulation of industry, and foreign trade.

For further information, contact the Office of Admissions, Graduate School of International Relations and Pacific Studies, UCSD, 9500 Gilman Drive, La Jolla, CA 92093-0520. (619) 534-5914.



## SCHOOL OF ARCHITECTURE

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The University of California Board of Regents has approved the establishment of a School of Architecture on the San Diego campus, making it the third UC campus, along with Berkeley and Los Angeles, to have a school of architecture. In his announcement of the school, Chancellor Atkinson said, "The school will provide an exciting and stimulating environment for undergraduate and graduate students alike. It will also provide innovative advances in design and engineering that will contribute to architecture in San Diego and the world community."

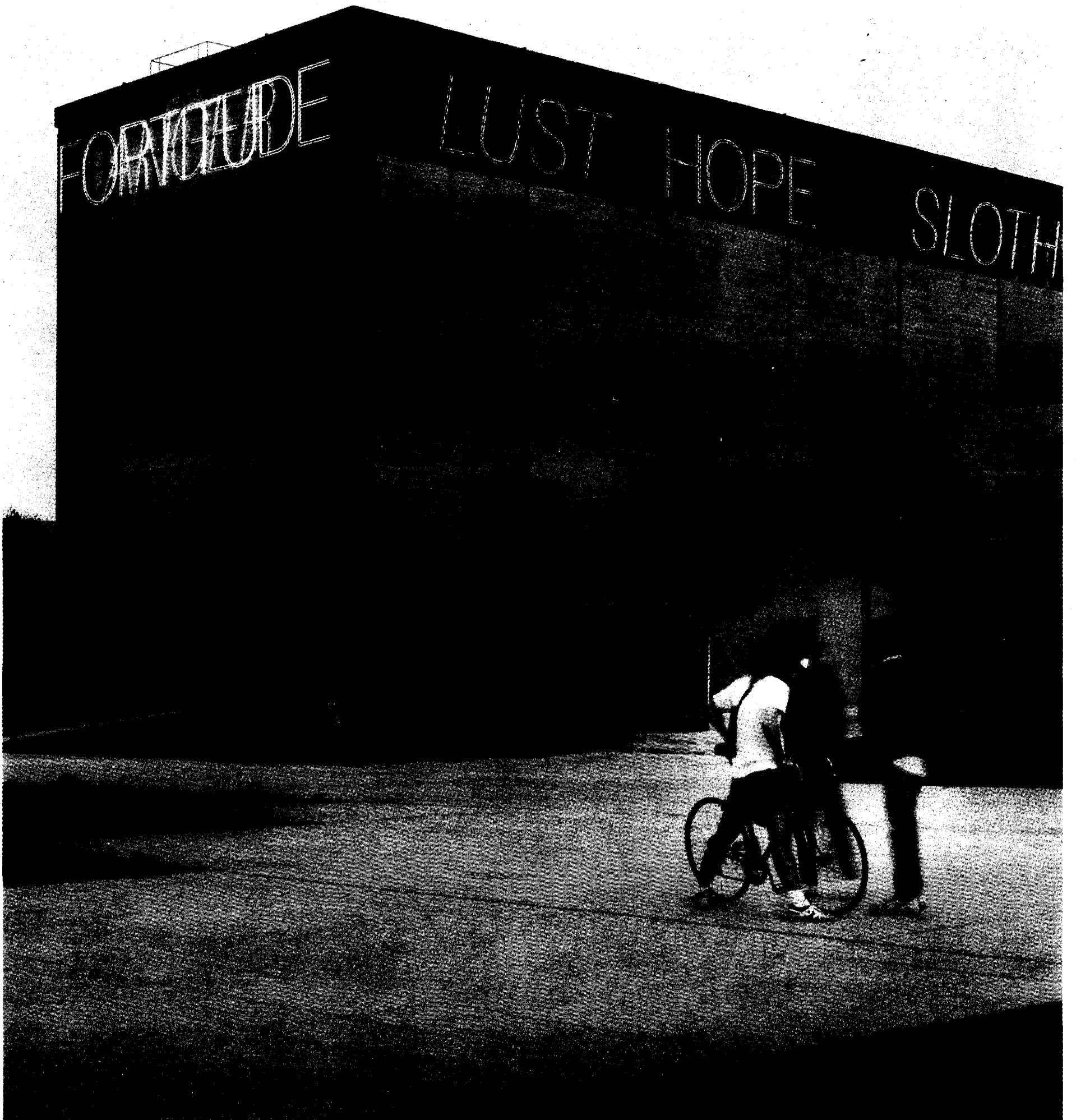
Adèle Naudé Santos, noted architect and educator, has been appointed founding dean of the school. Her mission is to create a new model for architectural education, one that is more responsive to the changing social, environmental, and technical issues facing the architectural profession. "I believe it is time for a school to address the realities of the world our students will inherit and to prepare them to play a relevant role within it," says Santos. "The school will be research based, and the research will set the intellectual tone for the curriculum and give meaning to the education of our students." Students and faculty will explore architectural issues of both regional and global scale, and the school should be an international forum for exchange of ideas.

Classes are planned to begin in fall 1992, and the following degree programs are pending approval: master of architecture I and II; and an M.S. in architectural studies. A bachelor of arts with a major in architecture is planned as well, and a small Ph.D. program should be in place by 1993 or 1994.

The undergraduate program will provide students with a challenging liberal arts major with emphasis in architectural studies. The goal of the master's programs will be to train students to bring intelligence, imagination, and sensitivity to the design of the built environment and to provide graduates with a foundation for a lifetime of learning.

Students interested in the programs should contact the School of Architecture for current information.







## UCSD FACULTY MEMBERS

NAME	TITLE	DEPARTMENT	COLLEGE
Abarbanel, Henry D. I.	Professor	Physics	Revelle
Abramson, Ian S.	Associate Professor	Mathematics	Muir
Ackerman, Farrell	Assistant Professor	Linguistics	Third
Adler, Steven	Lecturer (SOE)	Theatre	Fifth
Agler, Jim	Associate Professor	Mathematics	Muir
Agnew, Duncan C.	Professor	SIO	SIO
Agre, Philip E.	Assistant Professor	Communication	Muir
Alexander, Nicholas M.	Professor	Pathology	SchMed
Alfven, Hannes	Professor Emeritus	ECE	Muir
Algaze, Guillermo	Assistant Professor	Anthropology	Fifth
Allison, Henry E.	Professor	Philosophy	Revelle
Allison, William S.	Professor	Chemistry	SchMed
Anagnostopoulos, Georgios H.	Associate Professor	Philosophy	Warren
Ancoli-Israel, Sonia	Associate Professor-in-Res	Psychiatry	SchMed
Anderson, Donald W.	Professor/Dean	Mathematics/Natural Sciences	Muir
Anderson, Norman H.	Professor	Psychology	Muir
Anderson, Victor C.	Professor Emeritus	ECE	SIO/Muir
Anstis, Stuart	Acting Professor	Psychology	Fifth
Antin, David A.	Professor	Visual Arts	Muir
Antin, Eleanor	Professor	Visual Arts	Muir
Aref, Hassan	Professor	AMES	Warren/SIO
Armi, Laurence	Professor	SIO	SIO
Arneson, Richard J.	Professor	Philosophy	Third
Arnold, James R.	Professor	Chemistry	Revelle/SIO
Arovas, Daniel P.	Assistant Professor	Physics	Revelle
Arrhenius, Gustaf	Professor	SIO	SIO
Arthur, Robert S.	Professor Emeritus	SIO	SIO
Asaro, Robert J.	Professor	AMES	Revelle
Asbeck, Peter M.	Professor	ECE	Third
Atkinson, Richard C.	Professor/Chancellor	Psychology	Third
Attiyeh, Richard E.	Professor/Dean	Economics/Graduate Studies	Revelle
Azam, Farooq	Professor-in-Residence	SIO	SIO
Backus, George E.	Professor	SIO	SIO
Bada, Jeffrey L.	Professor	SIO	SIO/Revelle
Baden, Scott B.	Assistant Professor	CSE	Warren
Bailey, Frederick G.	Professor	Anthropology	Muir
Baird, Stephen M.	Professor of Clinical Pathology	Pathology	SchMed
Balzano, Gerald J.	Associate Professor	Music	Muir
Bank, Randolph E.	Professor	Mathematics	Warren
Baouendi, M. Salah	Professor	Mathematics	Warren
Barrett, Kim E.	Assistant Professor-in-Res	Medicine	SchMed
Bartlett, Douglas H.	Assistant Professor	SIO	SIO
Batali, John D.	Assistant Professor	Cognitive Sciences	Warren
Batchen, Geoffrey	Assistant Professor	Visual Arts	Third
Bates, Elizabeth A.	Professor	Cognitive Science/Psychology	Third
Baylis, Gordon C.	Assistant Professor	Psychology	Third
Bear, Donald V. T.	Professor	Economics	Revelle
Beck, Nathaniel L.	Associate Professor	Political Science	Warren
Behar, Jack	Associate Professor Emeritus	Literature	Revelle
Belew, Richard K.	Assistant Professor	CSE	Third

UCSD FACULTY MEMBERS

<b>Bender, Edward A.</b>	Professor	Mathematics	Muir
<b>Benirschke, Kurt</b>	Professor	Reproductive Med/Pathology	SchMed
<b>Benson, Andrew A.</b>	Professor Emeritus	SIO	SIO
<b>Benson, David J.</b>	Assistant Professor	AMES	Third
<b>Berg, Darwin K.</b>	Professor	Biology	Warren
<b>Berger, Bennett M.</b>	Professor Emeritus	Sociology	Muir
<b>Berger, Wolfgang H.</b>	Professor	SIO	SIO
<b>Berkowitz, Ami E.</b>	Professor	Physics	Warren
<b>Berman, Francine D.</b>	Associate Professor	CSE	Revelle
<b>Berman, Ronald S.</b>	Professor	Literature	Muir
<b>Bernstein, Michael A.</b>	Associate Professor	History	Warren
<b>Bertram, H. Neal</b>	Professor	ECE	Revelle
<b>Betts, Julian</b>	Assistant Professor	Economics	Third
<b>Bickford, Reginald G.</b>	Professor Emeritus	Neurosciences	SchMed
<b>Bier, Ethan</b>	Assistant Professor	Biology	Fifth
<b>Biernacki, Richard</b>	Assistant Professor	Sociology	Muir
<b>Blanco, Carlos</b>	Professor	Literature	Third
<b>Blantz, Roland C.</b>	Professor-in-Residence	Medicine	SchMed
<b>Bloor, Colin M.</b>	Professor	Pathology	SchMed
<b>Blumberg, Rae L.</b>	Associate Professor	Sociology	Third
<b>Bohn, Roger E.</b>	Assistant Professor	IRPS	IRPS
<b>Bond, F. Thomas</b>	Associate Professor/Provost	Chemistry/Revelle	Revelle
<b>Borjas, George J.</b>	Professor	Economics	Third
<b>Both, Andrei</b>	Acting Associate Professor	Theatre	Third
<b>Bowles, Kenneth L.</b>	Professor Emeritus	CSE	Muir
<b>Boynton, Robert M.</b>	Professor Emeritus	Psychology	Fifth
<b>Brace, Robert A.</b>	Professor	Reproductive Medicine	SchMed
<b>Bradbury, Jack W.</b>	Professor	Biology	Muir
<b>Bradley, Loretta</b>	Assistant Professor	CSE	Muir
<b>Bradner, Hugh</b>	Professor Emeritus	AMES	Revelle/SIO
<b>Braff, David L.</b>	Professor	Psychiatry	SchMed
<b>Branson, James G.</b>	Professor	Physics	Third
<b>Brenner, Suzanne A.</b>	Assistant Professor	Anthropology	Warren
<b>Brian, Adrienne A.</b>	Assistant Professor	Chemistry	Warren
<b>Bridges, Amy</b>	Associate Professor	Political Science	Third
<b>Britton, Karen T.</b>	Associate Professor-in-Res	Psychiatry	SchMed
<b>Brodsky, Linda</b>	Associate Professor	Literature	Warren
<b>Brody, Stuart</b>	Professor	Biology	Muir
<b>Brown, Joan Heller</b>	Professor	Pharmacology	SchMed
<b>Brown, Kevin M.</b>	Assistant Professor	SIO	SIO
<b>Brown, Marvin R.</b>	Professor-in-Residence	Medicine/Surgery	SchMed
<b>Brown, Sandra A.</b>	Associate Professor-in-Res	Psychiatry	SchMed
<b>Brown, Willie C.</b>	Associate Professor	Biology	Third
<b>Brueckner, Keith A.</b>	Professor Emeritus	Physics	Revelle
<b>Brunton, Laurence L.</b>	Associate Professor	Pharmacology/Medicine	SchMed
<b>Buckingham, Michael J.</b>	Acting Professor	SIO	SIO
<b>Bullock, Theodore H.</b>	Professor Emeritus	Neurosciences	SchMed/SIO
<b>Bunch, James R.</b>	Professor	Mathematics	Warren
<b>Burbidge, E. Margaret</b>	Professor Emeritus	Physics	Revelle
<b>Burbidge, Geoffrey R.</b>	Professor	Physics	Revelle
<b>Burkhard, Walter A.</b>	Professor	CSE	Warren
<b>Buss, Samuel R.</b>	Associate Professor	Mathematics	Fifth
<b>Butters, Nelson M.</b>	Professor-in-Residence	Psychiatry	SchMed
<b>Cancel, Robert</b>	Associate Professor	Literature	Third
<b>Cande, Steven C.</b>	Professor	SIO	SIO
<b>Carmody, James</b>	Assistant Professor	Theatre	Warren

<b>Carson, Richard T.</b>	Associate Professor	Economics	Muir
<b>Casalduero, Joaquin</b>	Professor Emeritus	Literature	Revelle
<b>Case, Ted J.</b>	Professor	Biology	Revelle
<b>Caserio, Marjorie C.</b>	Professor/Vice Chancellor	Chemistry/Acad. Affairs	Third
<b>Cassedy, Steven D.</b>	Professor	Literature	Fifth
<b>Castillo, Paterno E.</b>	Assistant Professor	SIO	SIO
<b>Catalan, Diego</b>	Professor Emeritus	Literature	Revelle
<b>Cattolica, Robert J.</b>	Professor	AMES	Warren
<b>Cavane, Webster K.</b>	Professor	Medicine	SchMed
<b>Cespedes, Guillermo</b>	Professor Emeritus	History	Revelle
<b>Chang, William S. C.</b>	Professor	ECE	Warren
<b>Charles, Christopher D.</b>	Assistant Professor	SIO	SIO
<b>Chatterjee, Shankar</b>	Assistant Professor	ECE	Warren
<b>Chau, Pao C.</b>	Associate Professor	AMES	Revelle
<b>Chau, Paul M.</b>	Assistant Professor	ECE	Revelle
<b>Cheatham, James R.</b>	Sr. Lecturer (SOE)	Music	Third
<b>Checkley, David M.</b>	Associate Professor	SIO	SIO
<b>Chen, Joseph C. Y.</b>	Professor	Physics	Fifth
<b>Chen, Matthew Y. C.</b>	Professor	Linguistics	Muir
<b>Chen, Pojen P.</b>	Associate Professor-in-Res	Medicine/Pathology	SOM
<b>Cheng, Chung-Kuan</b>	Assistant Professor	CSE	Muir
<b>Cheng, Tun-jen</b>	Assistant Professor	IRPS	IRPS/Fifth
<b>Chien, Kenneth R.</b>	Associate Professor	Medicine	SchMed
<b>Chien, Shu</b>	Professor	AMES	SchMed
<b>Chodorow, Stanley A.</b>	Professor/Dean	History/Arts and Humanities	Revelle
<b>Chojkier, Mario</b>	Associate Professor-in-Res	Medicine	SOM
<b>Chokshi, Atul H.</b>	Assistant Professor	AMES	Fifth
<b>Chrispeels, Maarten J.</b>	Professor	Biology	Muir
<b>Christmas, Eric C.</b>	Professor Emeritus	Theatre	Muir
<b>Churchland, Patricia S.</b>	Professor	Philosophy	Muir
<b>Churchland, Paul M.</b>	Professor	Philosophy	Warren
<b>Cicourel, Aaron V.</b>	Professor	Cognitive Science/Sociology	Revelle
<b>Clark, Leigh B.</b>	Professor	Chemistry	Revelle
<b>Clementz, Brett A.</b>	Assistant Professor	Psychology	Third
<b>Cohen, Alain J. J.</b>	Professor	Literature	Muir
<b>Cohen, Harold</b>	Professor	Visual Arts	Muir
<b>Cole, Michael</b>	Professor	Communication	Fifth
<b>Coles, William A.</b>	Professor	ECE	Muir
<b>Comisso, Ellen T.</b>	Professor	Political Science	Fifth
<b>Concha, Jaime</b>	Professor	Literature	Muir
<b>Conlisk, John</b>	Professor	Economics	Revelle
<b>Constable, Catherine G.</b>	Assistant Professor	SIO	SIO
<b>Cooper, Charles R.</b>	Professor	Literature	Third
<b>Cornelius, Wayne A.</b>	Professor	Political Science	Fifth
<b>Cornell, Stephen E.</b>	Associate Professor	Sociology	Fifth
<b>Corrigan, Mary K.</b>	Associate Professor	Theatre	Warren
<b>Cottrell, Garrison W.</b>	Assistant Professor	CSE	Revelle
<b>Courchesne, Eric</b>	Professor	Neurosciences	SchMed
<b>Covell, James W.</b>	Professor	Medicine	SchMed
<b>Cowhey, Peter F.</b>	Professor	Political Science/IRPS	Warren
<b>Cox, Charles S.</b>	Professor Emeritus	SIO	SIO
<b>Cox, Gary W.</b>	Professor	Political Science	Muir
<b>Cox, Stephen D.</b>	Associate Professor	Literature	Revelle
<b>Craig, Ann L.</b>	Associate Professor	Political Science	Muir
<b>Craig, Harmon</b>	Professor	SIO	Revelle/SIO
<b>Crawford, Nigel</b>	Assistant Professor	Biology	Warren
<b>Crawford, Vincent P.</b>	Professor	Economics	Warren

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<b>Cristian, Flaviu</b>	Professor	CSE	Third
<b>Crowell, John E.</b>	Assistant Professor	Chemistry	Revelle
<b>Crowne, David K.</b>	Associate Professor	Literature	Revelle
<b>Cruz, Rene L.</b>	Assistant Professor	ECE	Third
<b>Curjel, Anthony</b>	Assistant Professor	Theatre	Third
<b>Curray, Joseph R.</b>	Professor Emeritus	SIO	SIO
<b>Curtis, William J. R.</b>	Acting Professor	Architecture	SchArch
<b>Cussins, Adrian</b>	Assistant Professor	Philosophy	Fifth
<b>D'Andrade, Roy G.</b>	Professor	Anthropology	Fifth
<b>Dashen, Roger F.</b>	Professor	Physics	Muir
<b>Davidson, R. Michael</b>	Professor	Literature	Revelle
<b>Davis, Charles E.</b>	Professor	Pathology/Medicine	SchMed
<b>Davis, Fred</b>	Professor Emeritus	Sociology	Warren
<b>Davis, Russ E.</b>	Professor	SIO	SIO
<b>Davis, Susan G.</b>	Associate Professor	Communication	Warren
<b>Dayton, Paul K.</b>	Professor	SIO	SIO
<b>Deak, Frantisek, J.</b>	Professor	Theatre	Warren
<b>Delis, Dean C.</b>	Associate Professor-in-Res	Psychiatry	SchMed
<b>denHaan, Wouter</b>	Assistant Professor	Economics	Third
<b>Dennis, Edward A.</b>	Professor	Chemistry	Revelle/SchMed
<b>Deutsch, Diana</b>	Professor	Psychology	Warren
<b>Deutsch, J. Anthony</b>	Professor	Psychology	Muir/SchMed
<b>Deverell, William F.</b>	Assistant Professor	History	Third
<b>Diamond, Patrick H.</b>	Professor	Physics	Fifth
<b>Diez-Medrano, Juan</b>	Assistant Professor	Sociology	Third
<b>Dijkstra, Abraham J.</b>	Professor	Literature	Revelle
<b>Dilling, Margaret W.</b>	Assistant Professor	Music	Third
<b>Dillmann, Wolfgang H.</b>	Professor	Medicine	SchMed
<b>Dimock, Wai-Chee</b>	Associate Professor	Literature	Fifth
<b>Dimsdale, Joel E.</b>	Professor-in-Residence	Psychiatry	SchMed
<b>Dionne, Vincent E.</b>	Professor	Pharmacology	SchMed
<b>Donoghue, Daniel J.</b>	Associate Professor	Chemistry	Revelle/SchMed
<b>Doolittle, Russell F.</b>	Professor	Biology/Chemistry	Revelle/SchMed
<b>Doppelt, Gerald D.</b>	Professor	Philosophy	Warren
<b>Dorman, LeRoy M.</b>	Professor	SIO	SIO
<b>Douglas, Jack D.</b>	Professor Emeritus	Sociology	Muir
<b>Doyle, Peter G.</b>	Professor	Mathematics	Warren
<b>Drake, Paul W.</b>	Professor	Political Science	Fifth
<b>Drake, William J.</b>	Assistant Professor	Communication	Fifth
<b>Driver, Bruce K.</b>	Assistant Professor	Mathematics	Third
<b>Dryden, Deborah M.</b>	Professor	Theatre	Muir
<b>Dubin, Daniel H.</b>	Assistant Professor	Physics	Muir
<b>duBois, Page A.</b>	Professor	Literature	Muir
<b>Dunseath, Thomas K.</b>	Associate Professor	Literature	Revelle
<b>Duntley, Seibert Q.</b>	Professor Emeritus	SIO	SIO
<b>Dutton, Richard W.</b>	Professor	Biology	SchMed
<b>Dymond, Patrick</b>	Associate Professor	CSE	Warren
<b>Dynes, Robert C.</b>	Professor	Physics	Warren
<b>Ebbesen, Ebbe B.</b>	Professor	Psychology	Muir
<b>Edelman, Robert S.</b>	Associate Professor	History	Revelle
<b>Edwards, Anthony</b>	Associate Professor	Literature	Third
<b>Elkan, Charles P.</b>	Assistant Professor	CSE	Revelle
<b>Ellisman, Mark H.</b>	Professor	Neurosciences	SchMed
<b>Elman, Jeffrey L.</b>	Professor	Cognitive Science/Linguistics	Muir
<b>Emr, Scott</b>	Professor	Medicine	SchMed

<b>Engel, Albert E. J.</b>	Professor Emeritus	SIO	SIO
<b>Engestrom, Yrjo H.</b>	Acting Professor	Communication	Third
<b>Engle, Robert F.</b>	Professor	Economics	Third
<b>Enright, James T.</b>	Professor	SIO	SIO
<b>Enright, Thomas J.</b>	Professor	Mathematics	Third
<b>Erickson, Gregory F.</b>	Professor	Reproductive Medicine	SchMed
<b>Erickson, Robert</b>	Professor Emeritus	Music	Muir
<b>Erie, Steven P.</b>	Associate Professor	Political Science	Third
<b>Esener, Sadik C.</b>	Associate Professor	ECE	Warren
<b>Esherick, Joseph</b>	Professor	History	Fifth
<b>Espiritu, Yen</b>	Assistant Professor	Ethnic Studies	Third
<b>Evans, Ivan T.</b>	Assistant Professor	Sociology	Fifth
<b>Evans, John W.</b>	Professor	Mathematics	Muir/SchMed
<b>Evans, Ronald J.</b>	Professor	Mathematics	Third
<b>Fagin, Steve</b>	Associate Professor	Visual Arts	Third
<b>Fahey, Robert C.</b>	Professor	Chemistry	Revelle
<b>Fainman, Yeshaiahu</b>	Associate Professor	ECE	Warren
<b>Fanestil, Darrell D.</b>	Professor	Medicine	SchMed
<b>Fantino, Edmund J.</b>	Professor	Psychology	Muir
<b>Farber, Manny</b>	Professor Emeritus	Visual Arts	Muir
<b>Farrell, Peter</b>	Professor Emeritus	Music	Warren
<b>Fauconnier, Gilles R.</b>	Acting Professor	Cognitive Science	Third
<b>Faulkner, D. John</b>	Professor	SIO	SIO/Revelle
<b>Feher, George</b>	Professor	Physics	Revelle
<b>Fejer, Jules A.</b>	Professor Emeritus	ECE	Muir
<b>Felbeck, Horst</b>	Associate Professor	SIO	SIO
<b>Fellman, Ronald D.</b>	Assistant Professor	ECE	Fifth
<b>Fenical, William H.</b>	Professor-in-Residence	SIO	SIO
<b>Fenner-Lopez, Claudio E.</b>	Lecturer (SOE)	Visual Arts/Communication	Third
<b>Feramisco, James R.</b>	Professor	Medicine/Pharmacology	SchMed
<b>Ferneyhough, Brian J.P.</b>	Professor	Music	Third
<b>Fierer, Joshua</b>	Professor-in-Residence	Medicine/Pathology	SchMed
<b>Fillmore, Jay P.</b>	Professor	Mathematics	Muir
<b>Firtel, Richard A.</b>	Professor	Biology	Revelle
<b>Fisk, Zachery</b>	Professor	Physics	Muir
<b>FitzGerald, Carl H.</b>	Professor	Mathematics	Revelle
<b>Fitzgerald, William C.</b>	Associate Professor	Literature	Warren
<b>Fitzsimmons, Patrick J.</b>	Professor	Mathematics	Third
<b>Fonville, John W.</b>	Associate Professor	Music	Revelle
<b>Foote, Stephen L.</b>	Associate Professor-in-Res	Psychiatry	SchMed
<b>Forbes, Douglass Jane</b>	Associate Professor	Biology	Muir
<b>Fortes, P. A. George</b>	Associate Professor	Biology	Third
<b>Foster, Frances S.</b>	Professor	Literature	Warren
<b>François, Jean-Charles</b>	Professor	Music	Fifth
<b>Frankel, Theodore T.</b>	Professor Emeritus	Mathematics	Revelle
<b>Frazer, William R.</b>	Professor	Physics	Third
<b>Fredkin, Donald R.</b>	Professor	Physics	Revelle
<b>Fredman, Michael L.</b>	Professor	Mathematics/ECE	Warren
<b>Freedman, David Noel</b>	Professor	History	Revelle
<b>Freedman, Michael H.</b>	Professor	Mathematics	Revelle
<b>Frenk, Margit</b>	Professor Emeritus	Literature	Third
<b>Friedkin, Morris E.</b>	Professor Emeritus	Biology	Revelle/SchMed
<b>Friedman, Richard E.</b>	Professor	Literature	Muir
<b>Friedman, Robert Marc</b>	Associate Professor	History	Warren
<b>Friedmann, Theodore</b>	Professor	Pediatrics	SchMed
<b>Frieman, Edward A.</b>	Prof/V Chan/Dean/Dir	SIO/Mar Sci/SIO/SIO	SIO



**UCSD FACULTY MEMBERS**

<b>Fuller, George M.</b>	Associate Professor	Physics	Fifth
<b>Fung, Yuan-Cheng B.</b>	Professor Emeritus	AMES	Revelle/SchMed
<b>Fussell, Edwin S.</b>	Professor Emeritus	Literature	Muir
<b>Gaffney, Floyd</b>	Professor	Theatre	Third
<b>Gage, Fred H.</b>	Professor	Neurosciences	SchMed
<b>Galambos, Robert</b>	Professor Emeritus	Neurosciences	SchMed
<b>Galbraith, John S.</b>	Professor Emeritus	History	Revelle
<b>Garsia, Adriano M.</b>	Professor	Mathematics	Revelle/SchMed
<b>Geiduschek, E. Peter</b>	Professor	Biology	SchMed/Fifth
<b>Getoor, Ronald K.</b>	Professor	Mathematics	Revelle/SchMed
<b>Geyer, Mark A.</b>	Professor-in-Residence	Psychiatry	SchMed
<b>Gharib, Morteza</b>	Associate Professor	AMES	Muir
<b>Gheissari, Ali</b>	Assistant Professor	Sociology	Third
<b>Gibson, Carl H.</b>	Professor	AMES/SIO	Revelle/SIO
<b>Gleskes, Joris M.T.M.</b>	Professor	SIO	SIO
<b>Gilbert, J. Freeman</b>	Professor	SIO	SIO
<b>Gill, Gordon N.</b>	Professor	Medicine	SchMed
<b>Gill, Philip E.</b>	Professor	Mathematics	Third
<b>Gillin, J. Christian</b>	Professor	Psychiatry	SchMed
<b>Gilpin, Michael E.</b>	Professor	Biology	Muir
<b>Goddard, Joseph D.</b>	Professor	AMES	Third
<b>Goldberg, Edward D.</b>	Professor	SIO	SIO
<b>Goldman, Harvey S.</b>	Associate Professor	Sociology	Third
<b>Gonzalez, Manuel F.</b>	Assistant Professor	Psychology	Revelle
<b>Goodblatt, David</b>	Professor	History	Muir
<b>Goodkind, John M.</b>	Professor	Physics	Revelle
<b>Goodman, Judith C.</b>	Assistant Professor	Psychology	Revelle
<b>Goodman, Murray</b>	Professor	Chemistry	Revelle
<b>Gorin, Jean-Pierre</b>	Professor	Visual Arts	Third
<b>Gough, David A.</b>	Professor	AMES	Third
<b>Gould, Robert J.</b>	Professor	Physics	Revelle
<b>Goulian, Mehran</b>	Professor	Medicine	SchMed
<b>Gourevitch, Peter A.</b>	Professor/Dean	Political Science/IRPS	IRPS/Fifth
<b>Granger, Clive W. J.</b>	Professor	Economics	Warren
<b>Grant, Igor</b>	Professor	Psychiatry	SchMed
<b>Green, Melvin H.</b>	Professor	Biology	Revelle
<b>Greenstein, Jack M.</b>	Associate Professor	Visual Arts	Muir
<b>Grobstein, Clifford</b>	Professor Emeritus	Biology	Revelle/SchMed
<b>Groves, Philip M.</b>	Professor	Psychiatry/Neurosciences	SchMed
<b>Groves, Theodore</b>	Professor	Economics	Revelle
<b>Guasch, J. Luis</b>	Associate Professor	Economics	Fifth
<b>Guest, Clark C.</b>	Associate Professor	ECE	Warren
<b>Gusfield, Joseph R.</b>	Professor Emeritus	Sociology	Muir
<b>Gutierrez, David G.</b>	Assistant Professor	History	Warren
<b>Gutierrez, Ramon A.</b>	Professor	History	Third
<b>Guza, Robert T.</b>	Professor	SIO	SIO
<b>Haas, Richard H.</b>	Associate Professor	Neurosci/Pathol/Pediatrics	SchMed
<b>Haff, Leonard R.</b>	Professor	Mathematics	Third
<b>Hahn, Steven</b>	Professor	History	Muir
<b>Haiman, Mark D.</b>	Assistant Professor	Mathematics	Fifth
<b>Halberstam, Judith M.</b>	Assistant Professor	Literature	Revelle
<b>Haldane, F. Duncan M.</b>	Professor	Physics	Muir
<b>Halkin, Hubert</b>	Professor	Mathematics	Revelle
<b>Halleck, DeeDee</b>	Associate Professor	Communication	Warren
<b>Hallin, Daniel C.</b>	Associate Professor	Communication	Third

Halpern, Francis R.	Professor Emeritus	Physics	Muir
Hamburger, Robert N.	Professor Emeritus	Pediatrics	Revelle/SchMed
Hamilton, Richard S.	Professor	Mathematics	Warren
Hammel, Harold T.	Professor Emeritus	SIO	SIO/SchMed
Harkins, Edwin L.	Professor	Music	Muir
Harper, Elvin	Professor	Chemistry	Third
Harris, William A.	Professor	Biology	Third
Harrison, Helen M.	Professor	Visual Arts	Fifth
Harrison, Newton A.	Professor	Visual Arts	Fifth
Hartouni, Valerie A.	Assistant Professor	Communication	Muir
Harvey, Daniel F.	Assistant Professor	Chemistry	Third
Haubrich, Richard A.	Professor Emeritus	SIO	SchMed
Hauger, Richard L.	Associate Professor-in-Res	Psychiatry	SchMed
Havis, Allan	Assistant Professor	Theatre	Muir
Hawkins, James W.	Professor	SIO	Revelle/SIO
Haxo, Francis T.	Professor Emeritus	SIO	SIO
Hayashi, Masaki	Professor	Biology	Revelle
Haydu, Jeffrey M.	Associate Professor	Sociology	Fifth
Haygood, Margo G.	Assistant Professor	SIO	SIO
Heaton, Robert K.	Professor	Psychiatry	SchMed
Hedrick, Stephen M.	Associate Professor	Biology	Third
Hegemier, Gilbert A.	Professor	AMES	Revelle
Heidenreich, Kim	Associate Professor-in-Res	Medicine	SchMed
Heiligenberg, Walter F.	Professor	SIO	SIO
Helinski, Donald R.	Professor	Biology	Third
Heller, Walter P.	Professor	Economics	Revelle
Hellman, Frances	Assistant Professor	Physics	Third
Helstrom, Carl W.	Professor Emeritus	ECE	Muir
Helton, John W.	Professor	Mathematics	Third
Henaff, Marcel	Acting Professor	Literature	Warren
Hendershott, Myrl C.	Professor	SIO	SIO
Hendrickson, David N.	Professor	Chemistry	Muir
Herbert, Timothy D.	Assistant Professor	SIO	SIO
Herz, Richard K.	Associate Professor	AMES	Warren
Hessler, Robert R.	Professor	SIO	SIO
Hildebrand, John A.	Associate Professor	SIO	SIO
Hillyard, Steven A.	Professor	Neurosciences	SchMed
Hirsch, Harry N.	Associate Professor	Political Science	Warren
Hirsch, Jorge E.	Professor	Physics	Revelle
Hock, Louis J.	Professor	Visual Arts	Third
Hodgetts, Craig	Professor	Architectre	SchArch
Hodgkiss, William S., Jr.	Professor	SIO	SIO
Hoffman, Nicole	Assistant Professor	Literature	Fifth
Hofmann, Alan F.	Professor	Medicine	SchMed
Hoger, Anne	Assistant Professor	AMES	Warren
Holland, John J.	Professor	Biology	Warren
Holland, Nicholas D.	Professor	SIO	SIO/Revelle
Holmgren, Beth	Assistant Professor	Literature	Warren
Holston, James	Assistant Professor	Anthropology	Warren
Holt, Christine E.	Assistant Professor-in-Res	Biology	Third
Horwitz, Robert B.	Associate Professor	Communication	Third
Hoshi, Takeo	Assistant Professor	IRPS	IRPS/Fifth
Houston, Alan C.	Assistant Professor	Political Science	Fifth
Howden, William E.	Professor	CSE	Muir
Howe, Fanny Q.	Professor	Literature	Warren
Howell, Stephen B.	Professor	Medicine	SchMed
Hu, Ping C.	Lecturer (SOE)	History	Muir

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<b>Hu, Te C.</b>	Professor	CSE	Warren
<b>Huerta, Jorge A.</b>	Professor	Theatre	Third
<b>Hughes, H. Stuart</b>	Professor Emeritus	History	Revelle
<b>Hughes, Judith M.</b>	Professor	History	Fifth
<b>Hunefeldt, Christine F.</b>	Assistant Professor	History	Third
<b>Hutchins, Edwin L.</b>	Associate Professor	Cognitive Science	Third
<b>Impagliazzo, Russell</b>	Assistant Professor	CSE	Third
<b>Inman, Douglas L.</b>	Professor Emeritus	SIO	SIO
<b>Insel, Paul A.</b>	Professor	Pharmacology/Medicine	SchMed
<b>Intaglietta, Marcos</b>	Professor	AMES	Revelle/SchMed
<b>Iraqui-Madoz, Vicente J.</b>	Assoc Prof of Clin Neurosciences	Neurosciences	SchMed
<b>Irons, Peter H.</b>	Professor	Political Science	Warren
<b>Irwin, Michael</b>	Assistant Professor-in-Res	Psychiatry	SchMed
<b>Jackson, Gabriel</b>	Professor Emeritus	History	Revelle
<b>Jacobson, Gary C.</b>	Professor	Political Science	Third
<b>James, Luther</b>	Associate Professor	Theatre	Muir
<b>Jed, Stephanie H.</b>	Associate Professor	Literature	Muir
<b>Jernigan, Terry L.</b>	Associate Professor-in-Res	Psychiatry/Radiology	SchMed
<b>Jeste, Dilip V.</b>	Professor-in-Residence	Psychiatry/Neurosciences	SchMed
<b>Johnson, Chalmers</b>	Professor	IRPS	IRPS/Fifth
<b>Jolley, S. Nicholas</b>	Professor	Philosophy	Revelle
<b>Jones, Barbara</b>	Professor	Physics	Muir
<b>Jones, Walton</b>	Professor	Theatre	Muir
<b>Jordan, David K.</b>	Professor	Anthropology	Revelle
<b>Judd, Lewis L.</b>	Professor	Psychiatry	SchMed
<b>Jules-Rosette, Bennetta W.</b>	Professor	Sociology	Muir
<b>Kadonaga, James T.</b>	Assistant Professor	Biology	Revelle
<b>Kagnoff, Martin F.</b>	Professor	Medicine	SchMed
<b>Kahler, Miles E.</b>	Professor	IRPS	IRPS/Fifth
<b>Kahr, Madlyn M.</b>	Professor Emeritus	Visual Arts	Warren
<b>Kamen, Martin D.</b>	Professor Emeritus	Chemistry	Revelle
<b>Kane, Alex</b>	Professor	IRPS	IRPS/Fifth
<b>Kaplan, David B.</b>	Assistant Professor	Physics	Third
<b>Kaplan, Robert M.</b>	Professor	Com & Fam Medicine	SchMed
<b>Kaprow, Allan</b>	Professor	Visual Arts	Warren
<b>Karin, Michael</b>	Professor	Pharmacology	SchMed
<b>Karis, Aleck</b>	Assistant Professor	Music	Warren
<b>Karten, Harvey J.</b>	Professor	Neurosciences/Psychiatry	SchMed
<b>Kastner, Miriam</b>	Professor	SIO	SIO/Revelle
<b>Katzman, Robert</b>	Professor	Neurosciences	SchMed
<b>Kavanagh, Karen L.</b>	Assistant Professor	ECE	Fifth
<b>Kayali, Hasan</b>	Assistant Professor	History	Fifth
<b>Kearns, David R.</b>	Professor Emeritus	Chemistry	Revelle
<b>Keeling, Charles D.</b>	Professor	SIO	SIO
<b>Kelner, Michael J.</b>	Associate Professor	Pathology	SchMed
<b>Kemmer, Suzanne E.</b>	Assistant Professor	Linguistics	Third
<b>Kernell, Samuel H.</b>	Professor	Political Science	Warren
<b>Keyssar, Helene</b>	Professor	Communication	Third
<b>Kirkland, Theo N.</b>	Associate Professor-in-Res	Pathology/Medicine	SchMed
<b>Kirkpatrick, Susan</b>	Professor	Literature	Muir
<b>Kirsch, David J.</b>	Assistant Professor	Cognitive Science	Fifth
<b>Kitcher, Patricia W.</b>	Professor	Philosophy	Revelle
<b>Kitcher, Philip S.</b>	Professor	Philosophy	Revelle
<b>Klein, Rachel</b>	Associate Professor	History	Warren

Klima, Edward S.	Professor Emeritus	Linguistics	Muir
Kluender, Robert E.	Assistant Professor	Linguistics	Fifth
Ko, Dorothy	Assistant Professor	History	Muir
Kohn, Joshua R.	Assistant Professor	Biology	Warren
Komives, Elizabeth A.	Assistant Professor	Chemistry	Fifth/SchMed
Konecni, Vladimir J.	Professor	Psychology	Muir
Kontje, Todd C.	Assistant Professor	Literature	Third
Kosmatka, John B.	Assistant Professor	AMES	Warren
Krause, Lawrence	Professor	IRPS	IRPS/Fifth
Kraut, Joseph	Professor	Chemistry	Revelle
Kreutz-Delgado, Kenneth	Assistant Professor	ECE	Warren
Kripke, Daniel F.	Professor-in-Residence	Psychiatry	SchMed
Kristan, William B., Jr.	Professor	Biology	Third
Kroll, Norman M.	Professor Emeritus	Physics	Revelle
Kronick, Richard G.	Assistant Professor	Comm & Fam Medicine	SchMed
Ku, Walter H.	Professor	ECE	Revelle
Kube, Paul R.	Assistant Professor	CSE	Third
Kuczynski, Ronald T.	Professor-in-Residence	Psychiatry	SchMed
Kulik, James A.	Associate Professor	Psychology	Warren
Kummel, Andrew C.	Assistant Professor	Chemistry	Muir
Kuroda, Sige-Yuki	Professor	Linguistics	Muir
Kutas, Marta	Professor	Cognitive Science	Muir
Kuti, Julius G.	Professor	Physics	Third
Kyte, Jack E.	Professor	Chemistry	Warren
Lakoff, Sanford A.	Professor	Political Science	Warren
Lal, Devendra	Professor	SIO	SIO
Lampland, Martha	Assistant Professor	Sociology	Fifth
Lane, Thomas A.	Professor	Pathology	SchMed
Langacker, Ronald W.	Professor	Linguistics	Revelle
Langdon, Margaret H.	Professor Emeritus	Linguistics	Warren
Larson, Philip C.	Associate Professor	Music	Fifth
Lasheras, Juan C.	Associate Professor	AMES	Third
Lau, Silvanus S.	Professor	ECE	Muir
Lawder, Standish D.	Associate Professor	Visual Arts	Warren
Ledden, Patrick J.	Sr. Lecturer (SOE)/Provost	Mathematics/Muir	Muir
Lee, Edward N.	Professor	Philosophy	Revelle
Lee, Sing H.	Professor	ECE	Muir
Leffert, Hyam L.	Professor	Pharmacology	SchMed
Lehmann, Bruce N.	Professor	IRPS	IRPS
Lettau, Reinhard	Professor Emeritus	Literature	Revelle
Levergood, Barbara J.	Assistant Professor	Linguistics	Warren
Levin, Andrew	Assistant Professor	Economics	Muir
Levin, Lisa	Associate Professor	SIO	SIO
Levine, Herbert B.	Professor	Physics	Third
Levine, Michael	Professor	Biology	Warren
Levy, Robert I.	Professor Emeritus	Anthropology	Muir
Lewak, George J.	Associate Professor Emeritus	ECE	Muir
Lewin, Ralph A.	Professor Emeritus	SIO	SIO
Lewis, George	Assistant Professor	Music	Third
Libby, Paul A.	Professor Emeritus	AMES	Revelle
Liebermann, Leonard N.	Professor Emeritus	Physics	Revelle
Lijphart, Arend	Professor	Political Science	Revelle
Lin, James P.	Professor	Mathematics	Muir
Lin, Shao-Chi	Professor Emeritus	AMES	Revelle
Lin, Ting-Ting Y.	Assistant Professor	ECE	Muir
Lindenberg, Katja	Professor	Chemistry	Third

UCSD FACULTY MEMBERS

<b>Lindsley, Dan L.</b>	Professor Emeritus	Biology	Revelle/SchMed
<b>Lipsitz, George</b>	Professor	Ethnic Studies	Third
<b>Livingston, Robert B.</b>	Professor Emeritus	Neurosciences	SchMed
<b>Lonidier, Fred S.</b>	Associate Professor	Visual Arts	Revelle
<b>Lonsdale, Peter F.</b>	Professor	SIO	SIO
<b>Loomis, William F., Jr.</b>	Professor	Biology	Revelle
<b>Lovberg, Ralph H.</b>	Professor Emeritus	Physics	Revelle
<b>Lowe, Lisa</b>	Assistant Professor	Literature	Muir
<b>Luco, J. Enrique</b>	Professor	AMES	Third
<b>Luft, David S.</b>	Professor	History	Revelle
<b>Lugannani, Robert</b>	Professor	ECE	Warren
<b>Luhrmann, Tanya M.</b>	Assistant Professor	Anthropology	Third
<b>Lumpkin, Oscar J.</b>	Associate Professor	Physics	Revelle
<b>Luo, Huey-Lin</b>	Professor	ECE	Muir
<b>Lupia, Arthur W.</b>	Assistant Professor	Political Science	Third
<b>Lyon, James K.</b>	Professor/Provost	Literature/Fifth	Fifth
<b>Lytle, Cecil W.</b>	Professor/Provost	Music/Third	Third
<b>MacConnel, Kim R.</b>	Professor	Visual Arts	Third
<b>MacDonald, Gordon</b>	Professor	IRPS	IRPS
<b>Macdougall, J. Douglas</b>	Professor	SIO	Revelle/SIO
<b>Machina, Mark J.</b>	Professor	Economics	Revelle
<b>MacLeod, Carol L.</b>	Associate Professor-in-Res	Medicine	SchMed
<b>MacLeod, Donald I.A.</b>	Professor	Psychology	Muir
<b>Madsen, Richard P.</b>	Professor	Sociology	Fifth
<b>Magagna, Victor V.</b>	Associate Professor	Political Science	Muir
<b>Magde, Douglas</b>	Professor	Chemistry	Warren
<b>Malhotra, Vivek</b>	Assistant Professor	Biology	Revelle
<b>Malmberg, John H.</b>	Professor Emeritus	Physics	Revelle
<b>Manaster, Alfred B.</b>	Professor	Mathematics	Revelle
<b>Mandell, Arnold J.</b>	Professor Emeritus	Psychiatry	SchMed
<b>Mandler, George</b>	Professor	Psychology	Muir
<b>Mandler, Jean M.</b>	Professor	Cognitive Science/Psychology	Revelle
<b>Mangolte, Babette M.</b>	Associate Professor	Visual Arts	Third
<b>Manohar, Aneesh V.</b>	Professor	Physics	Third
<b>Maple, M. Brian</b>	Professor	Physics	Revelle
<b>Mares, David R.</b>	Associate Professor	Political Science	Muir
<b>Marino, John A.</b>	Associate Professor	History	Revelle
<b>Mariscal, George L.</b>	Associate Professor	Literature	Warren
<b>Markenscoff, Xanthippe</b>	Professor	AMES	Revelle
<b>Marquardt, Diana L.</b>	Associate Professor-in-Res	Medicine	SchMed
<b>Marshall, Margaret C.</b>	Lecturer (SOE)	Theatre	Third
<b>Marti, Kurt</b>	Professor	Chemistry	Revelle
<b>Martin, Lisa L.</b>	Assistant Professor	Political Science	Fifth
<b>Masek, George E.</b>	Professor	Physics	Revelle
<b>Masouredis, Serafeim P.</b>	Professor Emeritus	Pathology	SchMed
<b>Masry, Elias</b>	Professor	ECE	Muir
<b>Masters, T. Guy</b>	Professor	SIO	SIO
<b>Mathieu-Costello, Odile</b>	Associate Professor-in-Res	Medicine	SchMed
<b>McCubbins, Mathew D.</b>	Professor	Political Science	Third
<b>McCulloch, Andrew D.</b>	Assistant Professor	AMES	Muir
<b>McCurry, Stephanie</b>	Assistant Professor	History	Warren
<b>McDaniel, Timothy L.</b>	Professor	Sociology	Fifth
<b>McElroy, William D.</b>	Professor Emeritus	Biology	Revelle
<b>McGowan, John A.</b>	Professor	SIO	SIO
<b>McIlwain, Carl E.</b>	Professor	Physics	Revelle
<b>McKittrick, Joanna M.</b>	Assistant Professor	AMES	Warren



<b>McMillan, R. John</b>	Professor	IRPS	IRPS/Fifth
<b>McMorris, Trevor C.</b>	Professor	Chemistry	Third
<b>Meeker, Michael E.</b>	Professor	Anthropology	Revelle
<b>Mehan, Hugh B., Jr.</b>	Professor	Sociology	Third
<b>Melville, Wallace K.</b>	Professor	SIO	SIO
<b>Mendis, D. Asoka</b>	Professor	ECE	Muir
<b>Meranze, Michael</b>	Assistant Professor	History	Third
<b>Metzger, Thomas A.</b>	Professor Emeritus	History	Muir
<b>Meyers, Marc A.</b>	Professor	AMES	Revelle
<b>Middleman, Stanley</b>	Professor	AMES	Warren
<b>Miles, John W.</b>	Professor Emeritus	AMES	Warren
<b>Miller, Arnold L.</b>	Professor	Neurosciences	SchMed
<b>Miller, David R.</b>	Professor	AMES	Revelle
<b>Miller, Jeffrey O.</b>	Professor	Psychology	Revelle
<b>Miller, Stanley L.</b>	Professor	Chemistry	Revelle
<b>Mills, Stanley E.</b>	Professor Emeritus	Biology	Muir
<b>Milstein, Laurence B.</b>	Professor	ECE	Warren
<b>Minster, Jean-Bernard</b>	Professor	SIO	SIO
<b>Mitchell, Allan</b>	Professor	History	Fifth
<b>Mitchell, Sandra D.</b>	Assistant Professor	Philosophy	Revelle
<b>Miyai, Katsumi</b>	Professor	Pathology/Medicine	SchMed
<b>Miyoshi, Masao</b>	Professor	Literature	Third
<b>Montal, S. Mauricio</b>	Professor	Physics/Biology	Revelle
<b>Monteon, Michael P.</b>	Associate Professor	History	Muir
<b>Montrose, Louis A.</b>	Professor	Literature	Revelle
<b>Moore, F. Richard</b>	Professor	Music	Revelle
<b>Moore, James J.</b>	Assistant Professor	Anthropology	Warren
<b>Moore, Stanley W.</b>	Professor Emeritus	Philosophy	Revelle
<b>Mosshammer, Alden A.</b>	Professor	History	Revelle
<b>Mukerji, Chandra</b>	Professor	Sociology/Communication	Third
<b>Mullin, Michael M.</b>	Professor	SIO	SIO
<b>Munk, Walter H.</b>	Professor Emeritus	SIO	SIO/Warren
<b>Murakami, Hidenori</b>	Associate Professor	AMES	Revelle
<b>Murre, Cornelius</b>	Assistant Professor	Biology	Revelle
<b>Myers, Robert R.</b>	Professor-in-Residence	Anesthesiology/Pathology	SchMed
<b>Nachbar, William</b>	Professor Emeritus	AMES	Revelle
<b>Naughton, Barry</b>	Assistant Professor	IRPS	IRPS
<b>Nee, Thomas B.</b>	Professor Emeritus	Music	Warren
<b>Négyesy, János</b>	Professor	Music	Muir
<b>Nelson, Ann E.</b>	Assistant Professor	Physics	Muir
<b>Nemat-Nasser, Siavouche</b>	Professor	AMES	Revelle
<b>Nesbitt, Muriel N.</b>	Associate Professor	Biology	SchMed/Warren
<b>Neville, Helen</b>	Professor	Cognitive Science	Warren
<b>Newman, William A.</b>	Professor	SIO	SIO
<b>Newmark, Leonard D.</b>	Professor Emeritus	Linguistics	Revelle
<b>Newport, John W.</b>	Associate Professor	Biology	Muir
<b>Nicolaou, Kyriacos C.</b>	Professor	Chemistry	Muir
<b>Nierenberg, William A.</b>	Prof/V Chan/Dir Emeritus	SIO/Mar Sci/SIO	SIO
<b>Niiler, Pearn P.</b>	Professor	SIO	SIO
<b>Noble, Gregory W.</b>	Assistant Professor	Political Science	Muir
<b>Nodelman, Sheldon A.</b>	Associate Professor	Visual Arts	Warren
<b>Norman, Donald A.</b>	Professor	Cognitive Science	Revelle
<b>Northcutt, R. Glenn</b>	Professor	Neurosciences	SchMed
<b>O'Brien, John S.</b>	Professor	Neurosciences	SchMed
<b>O'Brien, William A.</b>	Assistant Professor	Literature	Muir

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<b>O'Connor, Daniel T.</b>	Professor-in-Residence	Medicine	SchMed
<b>O'Connor, Joseph M.</b>	Assistant Professor	Chemistry	Third
<b>Oesterreicher, Hans K.</b>	Professor	Chemistry	Muir
<b>Ogdon, Wilbur L.</b>	Professor Emeritus	Music	Muir
<b>Ohman, Mark D.</b>	Assistant Professor	SIO	SIO
<b>Okamura, Melvin Y.</b>	Professor	Physics	Revelle
<b>Olafson, Frederick A.</b>	Professor Emeritus	Philosophy	Revelle
<b>Olefsky, Jerrold M.</b>	Professor	Medicine	SchMed
<b>Olfe, Daniel B.</b>	Professor	AMES	Revelle
<b>O'Neil, Thomas M.</b>	Professor	Physics	Warren
<b>Onuchic, José N.</b>	Assistant Professor	Physics	Muir
<b>O'Quigley, John</b>	Professor	Mathematics	Muir/SchMed
<b>Orailoglu, Alex</b>	Assistant Professor	CSE	Revelle
<b>Orcutt, John A.</b>	Professor	SIO	SIO
<b>Orloff, Marshall J.</b>	Professor	Surgery	SchMed/Muir
<b>Osman, Allen</b>	Assistant Professor	Psychology	Warren
<b>Paar, Hans</b>	Acting Professor	Physics	Revelle
<b>Padden, Carol A.</b>	Associate Professor	Communication	Third
<b>Pandol, Stephen J.</b>	Associate Professor-in-Res	Medicine	SchMed
<b>Papadimitriou, Christos H.</b>	Professor	CSE	Muir
<b>Parker, Robert L.</b>	Professor	SIO	SIO
<b>Parrish, Michael E.</b>	Professor	History	Muir
<b>Parry, Christopher N.</b>	Assistant Professor	Theatre	Fifth
<b>Pashler, Harold E.</b>	Associate Professor	Psychology	Muir
<b>Pasler, Jann C.</b>	Associate Professor	Music	Fifth
<b>Pasquale, Joseph</b>	Assistant Professor	CSE	Third
<b>Patterson, Patricia A.</b>	Professor	Visual Arts	Muir
<b>Paturi, Ramamohan</b>	Assistant Professor	CSE	Warren
<b>Pearce, Roy Harvey</b>	Professor Emeritus	Literature	Fifth
<b>Pearson, J. Steven</b>	Professor	Theatre	Muir
<b>Penn, Nolan E.</b>	Professor	Psychiatry	SchMed
<b>Penner, Stanford S.</b>	Professor Emeritus	AMES	Revelle
<b>Pereira, Alfredo M.</b>	Assistant Professor	Economics	Warren
<b>Perlmutter, David M.</b>	Professor	Linguistics	Revelle
<b>Perrin, Charles L.</b>	Professor	Chemistry	Revelle
<b>Peterson, Laurence E.</b>	Professor	Physics	Revelle
<b>Peterson, Melvin N. A.</b>	Assoc. Prof. Emeritus	SIO	SIO
<b>Phillips, David P.</b>	Professor	Sociology	Revelle
<b>Phipps-Morgan, W. Jason</b>	Associate Professor	SIO	SIO
<b>Phleger, Fred B</b>	Professor Emeritus	SIO	SIO
<b>Piccioni, Oreste</b>	Professor Emeritus	Physics	Revelle
<b>Pickowicz, Paul G.</b>	Professor	History	Muir
<b>Pineda, Jaime A.</b>	Assistant Professor	Cognitive Science	Fifth
<b>Pinkel, Robert</b>	Professor	SIO	SIO
<b>Pinon, Ramon, Jr.</b>	Associate Professor	Biology	Third
<b>Pippin, Robert B.</b>	Professor	Philosophy	Revelle
<b>Plantamura, Carol</b>	Professor	Music	Revelle
<b>Polyzos, George C.</b>	Assistant Professor	CSE	Fifth
<b>Pomeroy, Earl</b>	Professor Emeritus	History	Warren
<b>Poole, Fitz John P.</b>	Associate Professor	Anthropology	Muir
<b>Popkin, Samuel L.</b>	Professor	Political Science	Third
<b>Posakony, James W.</b>	Associate Professor	Biology	Third
<b>Powell, Frank L.</b>	Associate Professor	Medicine	SchMed
<b>Powell, Henry C.</b>	Professor	Pathology	SchMed
<b>Pozrikidis, Constantine</b>	Associate Professor	AMES	Muir
<b>Price, Paul A.</b>	Professor	Biology	Muir

Price, Trevor D.	Assistant Professor	Biology	Muir
Priestley, M.J. Nigel	Professor	AMES	Warren
Printz, Morton P.	Professor	Pharmacology	SchMed
Propp, William H.	Assistant Professor	History	Muir
Quest, Kevin B.	Associate Professor	ECE	Warren
Rabin, Jeffrey M.	Associate Professor	Mathematics	Revelle
Radcliff, Pamela B.	Assistant Professor	History	Fifth
Rafael, Vicente L.	Associate Professor	Communication	Third
Raitt, Russell W.	Professor Emeritus	SIO	SIO
Ramachandran, Vilayanur S.	Professor	Psychology	Third
Ramanathan, Ramachandra	Professor	Economics	Revelle
Ramanathan, Veerabhadran	Professor	SIO	SIO
Ramey, Garey	Assistant Professor	Economics	Warren
Ramey, Valerie A.	Assistant Professor	Economics	Third
Rand, Sinai	Associate Professor Emeritus	AMES	Revelle
Randel, Fred V.	Associate Professor	Literature	Revelle
Rangan, Venkat P.	Assistant Professor	CSE	Revelle
Rao, Bhaskar D.	Associate Professor	ECE	Revelle
Rao, Ramesh	Associate Professor	ECE	Revelle
Rapaport, Samuel I.	Professor	Medicine/Pathology	SchMed
Rasmussen, Dennis D.	Associate Professor-in-Res	Reproductive Medicine	SchMed
Rauch, James E.	Assistant Professor	Economics	Third
Raut, Lakshmi K.	Assistant Professor	Economics	Warren
Rearden, C. Anne	Associate Professor	Pathology	SchMed
Reid, Joseph L.	Professor Emeritus	SIO	SIO
Reid, Roddey	Assistant Professor	Literature	Muir
Reissner, M. Erich	Professor Emeritus	AMES/Mathematics	Revelle
Rommel, Jeffrey D.	Professor	Mathematics	Muir
Reynolds, Edward	Professor	History	Third
Reynolds, Roger L.	Professor	Music	Muir
Richman, Douglas D.	Professor-in-Residence	Pathology/Medicine	SchMed
Rickett, Barnaby J.	Professor	ECE	Muir
Ricles, James M.	Assistant Professor	AMES	Muir
Ride, Sally K.	Professor	Physics	Third
Rincon, Patricia A.	Lecturer (SOE)	Theatre	Fifth
Ringgold, Faith	Professor	Visual Arts	Muir
Ringrose, David R.	Professor	History	Revelle
Rinott, Yosef	Acting Professor	Mathematics	Revelle
Ritchie, Robert C.	Professor	History	Muir
Rodin, Burton	Professor	Mathematics	Muir
Roeder, Philip G.	Assistant Professor	Political Science	Third
Roemmich, Dean H.	Associate Professor	SIO	SIO
Rohrl, Helmut	Professor	Mathematics	Revelle
Roise, David	Assistant Professor	Chemistry	Warren
Rona-Tas, Akos	Assistant Professor	Sociology	Fifth
Rosenblatt, Murray	Professor	Mathematics	Muir
Rosenblatt, Richard H.	Professor	SIO	SIO
Rosenbluth, Frances M.	Assistant Professor	IRPS	IRPS
Rosenbluth, Marshall N.	Professor	Physics	Fifth
Rosenfeld, Michael G.	Professor	Medicine	SchMed
Ross, Lola R.	Professor	Comm & Fam Medicine	SchMed/Muir
Rotenberg, Manuel	Professor	ECE	Muir
Rothenberg, Jerome D.	Professor	Visual Arts/Literature	Fifth
Rothschild, Linda P.	Professor	Mathematics	Warren
Rothschild, Michael	Professor/Dean	Economics/Social Sciences	Third

UCSD FACULTY MEMBERS

<b>Rudee, M. Lea</b>	Professor/Dean	ECE/Engineering	Warren
<b>Rudwick, Martin J.S.</b>	Professor	History	Warren
<b>Ruiz, Ramon E.</b>	Professor Emeritus	History	Muir
<b>Rumsey, Victor H.</b>	Professor Emeritus	ECE	Muir
<b>Russell, Percy J.</b>	Associate Professor Emeritus	Biology	SchMed
<b>Sah, Robert L.-Y.</b>	Assistant Professor	AMES	Muir
<b>Saier, Milton H., Jr.</b>	Professor	Biology	Muir
<b>Sailor, Michael J.</b>	Assistant Professor	Chemistry	Fifth
<b>Saitoh, Tsunao</b>	Associate Professor	Neurosciences	SchMed
<b>Saks, Michael E.</b>	Professor	CSE	Third
<b>Salmon, David P.</b>	Assistant Professor-in-Res	Neurosciences	SchMed
<b>Salmon, Richard L.</b>	Professor	SIO	SIO
<b>Saltman, Paul D.</b>	Professor	Biology	Revelle
<b>Sanchez, Marta E.</b>	Associate Professor	Literature	Third
<b>Sanchez, Rosaura</b>	Associate Professor	Literature	Third
<b>Sandwell, David T.</b>	Associate Professor	SIO	SIO
<b>Santos, Adele N.</b>	Professor/Dean	Architecture/SchArch	SchArch
<b>Saville, Jonathan</b>	Associate Professor	Theatre	Revelle
<b>Saville, Julie</b>	Assistant Professor	History	Third
<b>Savitch, Walter J.</b>	Professor	CSE	Muir
<b>Scanga, Italo</b>	Professor	Visual Arts	Muir
<b>Schane, Sanford A.</b>	Professor	Linguistics	Fifth
<b>Scheffler, Immo E.</b>	Professor	Biology	Revelle
<b>Schick, Steven E.</b>	Associate Professor	Music	Muir
<b>Schiller, Daniel T.</b>	Associate Professor	Communication	Muir
<b>Schiller, Herbert I.</b>	Professor Emeritus	Communication	Third
<b>Schmid-Schoenbein, Geert W.</b>	Professor	AMES	SchMed
<b>Schmidt, Robert J.</b>	Assistant Professor	Biology	Warren
<b>Schneider, Alan M.</b>	Professor	AMES	Warren
<b>Schneider, Jerry A.</b>	Professor	Pediatrics	SchMed
<b>Schrauzer, Gerhard N.</b>	Professor	Chemistry	Revelle
<b>Schreibman, Laura E.</b>	Professor	Psychology	Warren
<b>Schroeder, Julian I.</b>	Assistant Professor	Biology	Warren
<b>Schuckit, Marc A.</b>	Professor	Psychiatry	SchMed
<b>Schudson, Michael S.</b>	Professor	Sociology/Communication	Third
<b>Schuller, Ivan K.</b>	Professor	Physics	Revelle
<b>Schultz, Sheldon</b>	Professor	Physics	Third
<b>Schwartz, Theodore</b>	Professor	Anthropology	Muir
<b>Sclater, John G.</b>	Professor	SIO	SIO
<b>Scull, Andrew</b>	Professor	Sociology	Fifth
<b>Sebald, Anthony V.</b>	Associate Professor	ECE	Third
<b>Segal, David S.</b>	Professor	Psychiatry	SchMed
<b>Seible, Frieder</b>	Professor	AMES	Third
<b>Sejnowski, Terrence J.</b>	Professor	Biology	Muir
<b>Selverston, Allen I.</b>	Professor	Biology	Warren
<b>Sereno, Martin I.</b>	Assistant Professor	Cognitive Science	Warren
<b>Seshadri, Kalyanasundaram</b>	Associate Professor	AMES	Third
<b>Shadwick, Robert E.</b>	Assistant Professor	SIO	SIO
<b>Shafir, Gershon</b>	Associate Professor	Sociology	Fifth
<b>Shaiken, Harley</b>	Associate Professor	Communication	Revelle
<b>Sham, Lu Jeu</b>	Professor	Physics	Warren
<b>Shank, Adele E.</b>	Professor	Theatre	Third
<b>Shank, Theodore J.</b>	Professor	Theatre	Revelle
<b>Shapin, Steven</b>	Professor	Sociology	Revelle
<b>Sharpe, Michael J.</b>	Professor	Mathematics	Muir
<b>Shearer, Peter M.</b>	Associate Professor	SIO	SIO

<b>Shenk, Norman A.</b>	Associate Professor	Mathematics	Revelle
<b>Sher, Gila</b>	Assistant Professor	Philosophy	Warren
<b>Shevelow, Kathryn</b>	Associate Professor	Literature	Muir
<b>Shirk, Susan L.</b>	Professor	Political Science/IRPS	Fifth/IRPS
<b>Shor, George G., Jr.</b>	Professor Emeritus	SIO	SIO
<b>Shugart, Matthew F.</b>	Assistant Professor	IRPS	IRPS
<b>Shuler, Kurt E.</b>	Professor Emeritus	Chemistry	Revelle
<b>Shults, Clifford W.</b>	Assistant Professor	Neurosciences	SchMed
<b>Siegel, Jay S.</b>	Assistant Professor	Chemistry	Muir
<b>Silber, John J.</b>	Professor Emeritus	Music	Fifth
<b>Silva, Ernest R.</b>	Associate Professor	Visual Arts	Warren
<b>Simon, John D.</b>	Professor	Chemistry	Muir
<b>Singer, S. Jonathan</b>	University Professor	Biology	Revelle/SchMed
<b>Skalak, Richard</b>	Professor-in-Residence	AMES	SchMed
<b>Small, Lance W.</b>	Professor	Mathematics	Revelle
<b>Smallwood, Dennis E.</b>	Associate Professor	Economics	Warren
<b>Smith, Donald R.</b>	Professor	Mathematics	Revelle
<b>Smith, Douglas W.</b>	Professor	Biology	Muir
<b>Smith, Harding E.</b>	Professor	Physics	Revelle
<b>Smith, Peter H.</b>	Professor	Political Science	Third
<b>Smith, Susan L.</b>	Assistant Professor	Visual Arts	Third
<b>Snyder, Jon R.</b>	Associate Professor	Literature	Fifth
<b>Sobel, Joel</b>	Professor	Economics	Revelle
<b>Solis, Faustina</b>	Professor Emeritus	Comm & Fam Med	Third
<b>Somero, George N.</b>	Professor Emeritus	SIO	SIO
<b>Somerville, Richard C. J.</b>	Professor	SIO	SIO
<b>Sorensen, Harold W.</b>	Professor Emeritus	AMES	Revelle
<b>Spector, Deborah H.</b>	Professor	Biology	SchMed/Fifth
<b>Spiess, Fred N.</b>	Professor Emeritus	SIO	SIO
<b>Spiro, Melford E.</b>	Professor Emeritus	Anthropology	Muir
<b>Spitzer, Nicholas C.</b>	Professor	Biology	Muir
<b>Spivack, Arthur J.</b>	Assistant Professor	SIO	SIO
<b>Spooner, Charles E.</b>	Professor	Neurosciences	SchMed
<b>Squire, Larry R.</b>	Professor-in-Residence	Psychiatry	SchMed
<b>Stanton-Salazar, Ricardo D.</b>	Assistant Professor	Sociology	Muir
<b>Stark, Harold M.</b>	Professor	Mathematics	Muir
<b>Starr, Ross M</b>	Professor	Economics	Warren
<b>Steiger, Rand</b>	Associate Professor	Music	Warren
<b>Steinberg, Daniel</b>	Professor	Medicine	SchMed
<b>Steinmetz, Phel</b>	Associate Professor	Visual Arts	Revelle
<b>Stern, Herbert</b>	Professor Emeritus	Biology	Third
<b>Stevens, Jane</b>	Assistant Professor	Music	Warren
<b>Stewart, John L.</b>	Professor Emeritus	Literature	Muir
<b>Stiles, Joan</b>	Associate Professor	Psychology	Muir
<b>Stinchcombe, Maxwell B.</b>	Assistant Professor	Economics	Third
<b>St. John, Mark F.</b>	Assistant Professor	Cognitive Science	Third
<b>Storms, Lowell H.</b>	Professor-in-Residence	Psychiatry	SchMed
<b>Stroll, Avrum</b>	Professor Emeritus	Philosophy	Revelle
<b>Strom, Kaare</b>	Associate Professor	Political Science	Fifth
<b>Strong, Tracy B.</b>	Professor	Political Science	Fifth
<b>Strum, Shirley C.</b>	Professor	Anthropology	Revelle
<b>Suarez-Orozco, Marcelo</b>	Assistant Professor	Anthropology	Third
<b>Subramani, Suresh</b>	Professor	Biology	Warren
<b>Suess, Hans E.</b>	Professor Emeritus	Chemistry	Revelle/SIO
<b>Sueyoshi, Glenn</b>	Assistant Professor	Economics	Revelle
<b>Sugihara, George</b>	Associate Professor	SIO	SIO
<b>Suhl, Harry</b>	Professor Emeritus	Physics	Revelle



UCSD FACULTY MEMBERS

<b>Surko, Clifford M.</b>	Professor	Physics	Third
<b>Swain, Susan L.</b>	Professor-in-Residence	Biology	Revelle
<b>Swanson, Robert A.</b>	Professor Emeritus	Physics	Revelle
<b>Swartz, Marc J.</b>	Professor	Anthropology	Muir
<b>Sworder, David D.</b>	Professor	ECE	Revelle
<b>Takash, Paule Cruz</b>	Assistant Professor	Ethnic Studies	Third
<b>Talbot, Jan B.</b>	Associate Professor	AMES	Muir
<b>Talke, Frank E.</b>	Professor	AMES	Warren
<b>Talley, Lynne D.</b>	Associate Professor	SIO	SIO
<b>Tauxe, Lisa</b>	Associate Professor	SIO	SIO
<b>Tay, William Shu-sam</b>	Professor	Literature	Fifth
<b>Taylor, Palmer W.</b>	Professor	Pharmacology	SchMed
<b>Taylor, Susan S.</b>	Professor	Chemistry	SchMed/Fifth
<b>Teilhet-Fisk, Jehanne H.</b>	Professor	Visual Arts	Muir
<b>Terras, Audrey A.</b>	Professor	Mathematics	Revelle
<b>Terry, Robert D.</b>	Professor	Neurosciences/Pathology	SchMed
<b>Thal, Leon J.</b>	Professor	Neurosciences	SchMed
<b>Thiemens, Mark H.</b>	Professor	Chemistry	Third
<b>Thiess, Frank B.</b>	Sr. Lecturer (SOE) Emeritus	Mathematics	Third
<b>Thompson, William B.</b>	Professor Emeritus	Physics	Revelle
<b>Ticho, Harold K.</b>	Professor	Physics	Third
<b>Tilley, T. Don</b>	Professor	Chemistry	Third
<b>Tohsaku, Yasu-Hiko</b>	Associate Professor	IRPS	IRPS/Fifth
<b>Tokuyasu, Kiyoteru</b>	Professor-in-Res Emeritus	Biology	Revelle
<b>Tomlinson, Barbara</b>	Associate Professor	Literature	Muir
<b>Trauner, Doris A.</b>	Professor	Neurosciences/Pediatrics	SchMed
<b>Traylor, Teddy G.</b>	Professor Emeritus	Chemistry	Revelle
<b>Trogler, William C.</b>	Professor	Chemistry	Revelle
<b>Troupe, Quincy</b>	Professor	Literature	Third
<b>Truant, Cynthia M.</b>	Assistant Professor	History	Fifth
<b>Tschirgi, Robert D.</b>	Professor Emeritus	Neurosciences	SchMed/Muir
<b>Tsien, Roger K.</b>	Professor	Pharmacology/Chemistry	SchMed/Revelle
<b>Tu, Charles W.</b>	Professor	ECE	Fifth
<b>Tukey, Robert H.</b>	Associate Professor-in-Res	Medicine/Pharmacology	SchMed
<b>Turetzky, Bertram J.</b>	Professor	Music	Muir
<b>Turner, Christena</b>	Assistant Professor	Sociology	Fifth
<b>Tuzin, Donald F.</b>	Professor	Anthropology	Revelle
<b>Tytler, David R.</b>	Acting Associate Professor	Physics	Muir
<b>Ubbelomde, M. Susan</b>	Associate Professor	Architecture	SchArch
<b>Uht, Augustus K.</b>	Assistant Professor	CSE	Revelle
<b>Vacquier, Victor</b>	Professor Emeritus	SIO	SIO
<b>Vacquier, Victor D.</b>	Professor	SIO	SIO
<b>VanAtta, Charles W.</b>	Professor	AMES/SIO	Revelle/SIO
<b>Van Young, Eric</b>	Professor	History	Fifth
<b>Varki, Ajit P.</b>	Professor	Medicine	SchMed
<b>Varon, Silvio S.</b>	Professor	Biology	SchMed
<b>Vasquez, Olga</b>	Assistant Professor	Communication	Third
<b>Vecchio, Kenneth S.</b>	Assistant Professor	AMES	Fifth
<b>Vehrencamp, Sandra L.</b>	Professor	Biology	Muir
<b>Vendler, Zeno</b>	Professor Emeritus	Philosophy	Muir
<b>Verdicchio, Pasquale</b>	Assistant Professor	Literature	Fifth
<b>Vernon, Wayne</b>	Professor	Physics	Revelle
<b>Vianu, Victor D.</b>	Associate Professor	CSE	Third
<b>Viturbi, Andrew J.</b>	Professor	ECE	Warren

<b>Volcani, Benjamin E.</b>	Professor Emeritus	SIO	SIO
<b>Vold, Regitze R.</b>	Professor	Chemistry	Revelle
<b>Vold, Robert L.</b>	Professor	Chemistry	Revelle
<b>Von Lates, Adrienne</b>	Assistant Professor	Visual Arts	Muir
<b>Wadsworth, Adrian R.</b>	Professor	Mathematics	Warren
<b>Wagner, Arthur</b>	Professor Emeritus	Theatre	Muir
<b>Wagner, Peter D.</b>	Professor	Medicine	SchMed
<b>Wahlen, Martin</b>	Professor	SIO	SIO
<b>Waisman, Carlos H.</b>	Professor	Sociology	Third
<b>Walicke, Patricia A.</b>	Assistant Professor	Neurosciences	SchMed
<b>Walk, Cynthia</b>	Associate Professor	Literature	Fifth
<b>Walker, Kevin M.</b>	Assistant Professor	Mathematics	Third
<b>Wallach, Nolan R.</b>	Professor	Mathematics	Fifth
<b>Walter, Gernot F.</b>	Professor	Pathology	SchMed
<b>Wang, Jean Yin Jen</b>	Associate Professor	Biology	SchMed/Fifth
<b>Ward, John F.</b>	Professor	Radiology	SchMed
<b>Wasserman, Stephen I.</b>	Professor	Medicine	SchMed
<b>Watson, Joseph W.</b>	Professor/Vice Chancellor	Chemistry/Student Affairs	Third
<b>Watson, Kenneth M.</b>	Professor Emeritus	SIO	SIO
<b>Wavrik, John J.</b>	Associate Professor	Mathematics	Muir
<b>Wayne, Don E.</b>	Associate Professor	Literature	Muir
<b>Weare, John H.</b>	Professor	Chemistry	Revelle
<b>Wei, Wuchang</b>	Assistant Professor	SIO	SIO
<b>Weinger, Matthew B.</b>	Assistant Professor	Anesthesiology	SchMed
<b>Weiss, Ray F.</b>	Professor	SIO	SIO
<b>Wenkert, Ernest</b>	Professor	Chemistry	Revelle
<b>Wenzl, Hans</b>	Associate Professor	Mathematics	Third
<b>Werner, Bradley T.</b>	Assistant Professor	SIO	SIO
<b>Wesling, Donald T.</b>	Professor	Literature	Fifth
<b>West, John B.</b>	Professor	Medicine	SchMed
<b>Westman, Robert S.</b>	Professor	History	Muir
<b>Wheeler, John C.</b>	Professor	Chemistry	Revelle
<b>White, Fred N.</b>	Professor Emeritus	Medicine	SchMed/SIO
<b>White, Halbert L.</b>	Professor	Economics	Revelle
<b>Wieder, Harry H.</b>	Professor-in-Residence	ECE	Muir
<b>Wiederholt, Wigbert C.</b>	Professor	Neurosciences	SchMed
<b>Wiley, Clayton A.</b>	Associate Professor	Pathology/Neurosciences	SchMed
<b>Williams, Ben A.</b>	Professor	Psychology	Muir
<b>Williams, Forman A.</b>	Professor	AMES	Third
<b>Williams, Ruth J.</b>	Professor	Mathematics	Warren
<b>Williams, Sherley A.</b>	Professor	Literature	Third
<b>Williamson, S. Gill</b>	Professor	CSE	Fifth
<b>Wills, Christopher</b>	Professor	Biology	Warren/SchMed
<b>Wilson, Kent R.</b>	Professor	Chemistry	Revelle
<b>Winant, Clinton D.</b>	Professor	SIO	SIO
<b>Winker, James R.</b>	Associate Professor	Theatre	Third
<b>Winterer, Edward L.</b>	Professor	SIO	SIO
<b>Wiseman, Jacqueline P.</b>	Professor Emeritus	Sociology	Warren
<b>Wixted, John T.</b>	Assistant Professor	Psychology	Revelle
<b>Wolf, Jack K.</b>	Professor	ECE	Fifth
<b>Wolfe, Arthur M.</b>	Professor	Physics	Warren
<b>Woll, S. Heather</b>	Assistant Professor	CSE	Fifth
<b>Wong, David Y.</b>	Professor/Provost	Physics/Warren	Warren
<b>Wong-Staal, Flossie</b>	Professor	Biology/Medicine	Revelle/SchMed
<b>Woodhull, Winifred</b>	Assistant Professor	Literature	Warren
<b>Woodruff, David S.</b>	Professor	Biology	Fifth

**UCSD FACULTY MEMBERS**

**Woolard, Kathryn A.  
Wright, Andrew  
Wulbert, Daniel E.**

Associate Professor  
Professor Emeritus  
Professor

Sociology  
Literature  
Mathematics

Muir  
Revelle  
Third

**Xuong Nguyen-Huu**

Professor

Biology/Chemistry/Physics

Revelle/SchMed

**Yaffe, Michael P.  
Yaksh, Tony L.  
Yalowitz, Steven  
Yanofsky, Martin F.  
Yen, Samuel S.C.  
Yguerabide, Juan  
Yip, Wai-Lim  
York, Herbert F.  
Young, William R.  
Yu, Paul K. L.  
Yuasa, Joji**

Assistant Professor  
Professor  
Assistant Professor  
Assistant Professor  
Professor  
Professor  
Professor  
Professor Emeritus  
Professor  
Associate Professor  
Professor

Biology  
Anesthesiology  
Philosophy  
Biology  
Reproductive Medicine  
Biology  
Literature  
Physics  
SIO  
ECE  
Music

Third  
SchMed  
Fifth  
Warren  
SchMed  
Third  
Muir  
Warren  
SIO  
Revelle  
Warren

**Zamosc, Leon  
Zanetti, Maurizio  
Zimm, Bruno H.  
Zipser, David  
Zisook, Sidney  
Zivin, Justin A.  
Zola-Morgan, Stuart M.  
Zuker, Charles  
Zweifach, Benjamin W.**

Associate Professor  
Associate Professor-in-Res  
Professor Emeritus  
Professor  
Professor  
Professor  
Associate Professor-in-Res  
Associate Professor  
Professor Emeritus

Sociology  
Medicine  
Chemistry  
Cognitive Science  
Psychiatry  
Neurosciences  
Psychiatry  
Biology/Neurosciences  
AMES

Warren  
SchMed  
Revelle  
Fifth  
SchMed  
SchMed  
SchMed  
Revelle  
Warren/SchMed





UCSD is among the top universities in the country, a fact recognized by its membership in the Association of American Universities (other California universities in the AAU are UC Berkeley, UCLA, USC, Stanford, and Caltech). Central to UCSD's national prominence is the excellence of the faculty. By almost any measure, the faculty rate among the very best. For example, UCSD ranks among the top ten universities in the nation in the number of its faculty who are members of the National Academy of Sciences. UCSD faculty have also been elected in substantial numbers to the American Academy of Arts and Sciences, the National Academy of Engineering, the Institute of Medicine, and the American Philosophical Society.

Over 17,000 undergraduate and graduate students pursue degrees in a wide variety of academic programs at UCSD. The undergraduate program at San Diego embodies the cluster college concept; each student and faculty member belongs to one of the five colleges, and each college has its own general-education requirements. This college structure provides a stimulating environment of social and academic interaction that is rarely found on university campuses.

We are proud of our undergraduate program, which has received national and international recognition. Two surveys that rank universities on the percentage of their graduates accepted into medical school and graduates accepted into doctoral programs rated UCSD number one among public universities in placing students in these areas.

The distinguished faculty and the academic programs they have developed, together with the splendid physical setting of the campus, provide an incomparable university experience. The following interviews provide interesting insights by faculty, staff, and students.

**Richard C. Atkinson**  
**Chancellor, UCSD**

## QUINCY TROUPE

PROFESSOR OF LITERATURE



**P**oet Quincy Troupe, a man who has spent his life teaching young people about self-expression in the written word, found himself as the public voice for one of music's most enigmatic personalities, the late Miles Davis. In a book that Troupe describes as an "as told to" autobiography, Troupe captured the personality of Davis by "living in the man's pocket" for two years.

The book, titled *Miles: The Autobiography*, became a springboard for Troupe's own literary career. Prior to the Davis book, published in 1989, he had already published a book on the late black author, James Baldwin, called *The Legacy*. His published works also include a nonfiction book about television, *The Inside Story of T.V.'s Roots*, with David L. Wolper and several books of poetry, including his latest, *Weather Reports: New and Selected Poems*, published in December 1991.

Troupe taught for twenty years in New York City, at Richmond College and then at The College of Staten Island (CUNY). He also is an adjunct professor at Columbia University's Graduate Division of Writing. While in New York, he helped to produce two radio series for Public Broadcasting, "The Miles Davis Project" and "The John Coltrane Project."

Troupe joined UCSD's Department of Literature in 1990. He gives poetry readings regularly in San Diego, and all over the world.

### **Q. Why did you decide to come to UCSD to teach, after spending so much of your literary career in New York City?**

**A.** Susan Kirkpatrick, the department's previous chair, asked me to come, along with Third College Provost Cecil Lytle and Associate Chancellor Nolan Penn. They were genuinely interested in me. When I came to California to meet them, I liked the people I met and the writers who were here. I was very comfortable in New York, teaching in Staten Island, and living in Manhattan. I love New York, and I was right in the center of the writing communities, not just with the African-American, but with the whole of New York's writing scene. But in 1989, I started to feel a little uncomfortable in the city. My wife and I have a little boy, Porter, and I started thinking that it would be very good for him to grow up like my wife

and I did. My wife is from Mississippi, and she grew up in the country. I grew up in St. Louis, and I could run outside and play. So, I started to think that it would be a selfish thing for my wife and me to stay in New York for our own purposes. When we came to visit, we brought Porter, and he loved it. So that was it for us.

### **Q. What do you teach in your poetry classes?**

**A.** I try to teach the kids something about form. I think form is very important to poets. Most people come in, and they think, "Well, okay, I'm going to write free verse." So, when they come to my class, they have to write traditional forms and free verse. They learn about many forms of poetry. My whole idea about teaching poetry is that you have to make the students understand that it's all right to come from themselves, rather than come from where John Ashbery is, because they don't know John Ashbery. So they have to find what to write about in their own lives and their own experience. I try to get them to look into their own experience, their own surroundings, their own language, their own cultural and ethnic surroundings—the language that comes out of there.

### **Q. What are some of the things you try to get them to talk about in their poetry?**

**A.** Commonplace things can be great in poetry. You don't always have to think



about so-called high themes. You can look into your life and if you come from San Francisco, what is that about? If you are a woman, what is that about? If you are gay, what is that about? If you are African-American, what is that about? But at the same time you are an American and you're in the world: that's the international part. But you root yourself in what you know and you work up to the rest.

**Q. What is your idea about what poetry is?**

**A.** Poetry is about language; therefore, it's about singing. You know, singing. Poetry has been in the hands of academics over the last forty to fifty years, especially since T. S. Eliot, and it's not Eliot's fault, or Ezra Pound's, though they, and many critics and academics, kind of took poetry away from the people. They took it away and they put it in this little tower, and for a long time it hasn't touched anybody. And I want the students to understand that it doesn't have to be about this, that it can be about just natural, everyday things; but you must bring artistry to it. Poetry has to be about artistry, and creativity and imagination.

**Q. Your approach to poetry has brought you into some unusual situations. What was the most memorable for you?**

**A.** In 1989, one of the most wonderful things happened to me. Bill Moyers came out of no place. He called me up and said, "I want to do this television show on you and fifteen other people." He said that he used to love poetry, but at some point early in his academic career, he started to hate it. So, he went into journalism. Then he told me that in 1987 he started to examine why he disliked poetry so much, and decided to find out if there were any poets that he liked. He found people like myself, and Lee Young Lee, and Mary Tall Mountain, Sharon Olds,

Lucille Clifton, Robert Bly—poets that he loved. He made "The Power of the Word," and the segment I was on in 1989 won him the Emmy for interview of that year.

**Q. How did you become involved writing the Miles Davis autobiography?**

**A.** I was free-lancing for the *Village Voice* in New York. The editor at the time had a stable of writers, such as Amiri Baraka (LeRoi Jones) and Joel Oppenheimer. One day he said he was moving to *Spin*, the music magazine. He asked me to give him a wish list of stories I'd like to do. I went away and thought about it, and then called him with it. I told him I would like to do stories on Miles Davis, Michael Jackson, Prince, Chuck Berry, Patty LaBelle, and Sting. So he called me back and okayed me to do Miles, Jackson, Prince and Berry, in that order. We called up Miles Davis and he agreed to the interview. He doesn't usually do that. He didn't know me, my poetry, or anything. But I was very lucky. One of my ex-students was the publicist for Columbia Records at that time, so when my name came across her desk, she said, "Okay, we want him to do it," because she knew me and my work. They agreed in a day to let me do it.

**Q. What happened during the interview?**

**A.** She and I went to his apartment in New York, for what was supposed to be a one-and-a-half-hour interview. After two-and-a-half hours, we were still there. She had to go, and Miles and I spent ten hours together. I taped him on and off for ten hours. He cooked dinner for me and we looked at boxing matches. He was painting and he cooked some more. I called my wife and let her talk to him. It was amazing. I'll never forget that.

**Q. Did you do the piece for *Spin*?**

**A.** Yes, and I wrote so much material from the interview, it turned out to be the only two-part piece *Spin* has ever done. One thing led to another, and a few months later I received a call from Simon and Schuster telling me I had first right of refusal to write Miles Davis' life story. I was shocked. Well, everything worked out, and the book has been very popular. It won the 1990 American Book Award for Nonfiction, and was nominated for the 1990 R.J. Gleason award, which *Rolling Stone* magazine administers, and also was nominated for a Pulitzer Prize.

**Q. Now that you are in San Diego, what are your plans?**

**A.** Poetry is my main thing. It's what I am. I'm a poet. I try to teach my students how to get in touch with themselves. There was a young man in one of my classes—he came to my house on a Saturday because I had missed giving a class and we made it up at my house—who, when he came into the house, stopped and looked around at the paintings, and the art, and everything. He said, "Wow." He kept looking around and looking around. When he finally wrote his paper, he talked about the fact that he didn't know who he was, that he didn't have a culture, and that he was struck by the fact that my culture was reflected so strongly in my home. He said that he had been living through surfing, going to the beach, and getting a suntan. And he realized that wasn't enough. He said that he had to change, so that he could learn who he was, and learn how to define himself. That was an amazing experience for me. He thanked me for letting him know who I was, so that he could find out about himself. And, on top of that, he's a good writer.

**CHRISTINE HUNEFELDT**  
ASSISTANT PROFESSOR OF HISTORY



**C**hristine Hunefeldt was born in Germany, but left at an early age and spent most of her life in Peru. She completed her undergraduate degree in anthropology at the National San Marcos University in Lima, Peru. Hunefeldt did graduate studies at Cambridge University, England, in social anthropology and then finished her Ph.D. in ethnology, social, constitutional, and economic history at Bonn University in Germany in 1982.

Hunefeldt has taught history and anthropology at several universities in Peru and now is one of UCSD's newest faculty members.

She has published numerous publications including her recently completed book, titled *Lima's Urban Slaves: Family, Labor and Freedom, 1790-1860*.

**Q. What are your special areas of interest in history?**

**A.** Latin American and Andean history, particularly slavery, family and rural history.

**Q. How did you become interested in Latin American and Andean history?**

**A.** I started out actually doing research in anthropology. That research involved living in peasant communities. There I learned how deep-rooted beliefs and traditions were. At some time in between I felt it was not enough to look at present-day conditions. I decided to investigate the more long-term development, which led me to historical analysis. The ethnicity issue observed in peasant communities led me to a new issue, family relations, which represent a microcosm in which ethnicity is observable through people's daily experi-

ences. Since Andean societies also have strong black, Chinese, and Japanese immigrations, this new perspective brought insight into intercultural dynamics. So, at the end, I moved from peasants to slavery and family relations in general.

**Q. Prior to coming to UCSD, where were you teaching?**

**A.** I began teaching in Peru at a national university in 1976 in the sociology department. Since 1984, I taught in the economics department at the Catholic University in Lima, Peru.

**Q. What made you decide you wanted to teach at UCSD?**

**A.** Hard local conditions in Peru exist today. Intellectual activities become very difficult to organize. Libraries stopped buying books. Political priorities tend to undermine academic life. Then you start looking for alternatives, and of course, I had heard of San Diego. In Lima, due to the distribution of fields in the Catholic University, there is no economic history taught in the history department, which meant teaching economic history in the economics department. UCSD offered a very strong history department and it meant coming back to be among historians. I was

very impressed with UCSD's diversity. Also, here at UCSD there is a strong emphasis on Latin American issues, which is linked to faculty members in other social sciences researching Latin America and to the existence of the Institute of the Americas and the Graduate School of International Relations and Pacific Studies.

**Q. What has been learned from the changes occurring in Latin America?**

**A.** The changes are plentiful. You can't lump them together, but rather analyze what is happening on a country-to-country basis. I have seen that one of the big mistakes in terms of diplomatic issues and general economic policy relations between the U.S. and Latin American countries is the homogenizing tendency. Each country is different, and in not accounting for diversity the dialogue becomes distorted. Democracy and liberal policies do not have the same implications everywhere.

**Q. How do you think changes in Latin America will affect the rest of the world?**

**A.** Our attention today has been reoriented somewhat towards Eastern Europe, and what happens there is greatly affecting what is going on in Latin America. International strategies are also part of the aims of today's Latin American governments, with the return to democracy and, actually, with the United States encouraging these processes. I see some distortions as well that might be significant in terms of what we may learn from what is going on today in Latin America. A return to democracy, and liberalization, may not necessarily be the

best solution for Latin America. We'll see a reverse trend being repeated in other parts of the world, I'm sure.

**Q. What significant role will Latin America play in world affairs?**

**A.** One dimension is the financial issues, the debt crisis. Several actions and attitudes have forced international agencies into a re-evaluation of North-South relations, unequal exchange, and the meaning of political stability.

**Q. What research are you involved with now?**

**A.** I have submitted *Lima's Urban Slaves: Family, Labor and Freedom* to the UC Press and am now returning to broader issues related to family history.

**Q. What do you want your students to get out of your courses?**

**A.** Students become interested in history if it can be linked to one's own problems and patterns in the past. Therefore, I raise topics and issues that are relevant, so that students can relate their experiences to others' in the past, and learn how they dealt with those experiences.

*"Here at UCSD there is a strong emphasis on Latin American issues, which is linked to faculty members in other social sciences researching Latin America and to the existence of the Institute of the Americas and the Graduate School of International Relations and Pacific Studies."*

**Q. What career opportunities are there for someone interested in Latin American studies?**

**A.** Some possibilities are working with the U.S. State Department because it will help mold the international arena. Also, a relatively high percentage of graduates join the Peace Corps. Teaching is always another opportunity, and working in ministries and corporations. General knowledge in history, in this case, Latin America, is always good. It is a vital issue. You have to understand in order to transform.

## JAMES KADONAGA

ASSISTANT PROFESSOR OF BIOLOGY

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*ames Kadonaga, a native*

*Californian, firmly believes that*

*teaching inspires research, and vice versa.*

*As a result, Kadonaga has devoted consider-*

*able time to develop a new laboratory course*

*that teaches students state-of-the-art*

*techniques in biochemistry and molecular*

*biology. He believes this will benefit students*

*who intend to pursue a career in the*

*biological sciences.*

*Kadonaga came to UCSD in 1988 after*  
*serving as a postdoctoral research fellow at*

*UC Berkeley. He received his doctorate in*  
*chemistry from Harvard University in 1984.*

*Kadonaga admits biology is not his first*

*love, but he has applied his chemistry*

*knowledge to teaching and research in the*  
*biological sciences.*



### **Q. Why did you decide to come to UCSD?**

**A.** UCSD, for biologists, is a great place. There is a strong cluster of biologists here. It's one of the few places in the country where you can find top-notch researchers. I've always liked the idea of working at a research institution because there's a level of excitement. I also very much enjoy interacting with students.

### **Q. How did you become interested in chemistry?**

**A.** When I was in grade school, I always liked chemistry sets . . . it started out as a hobby at first. Then, when I was in high school, I was determined to be a wine maker. I have an appreciation of art and

science, and felt wine making was a blend of both. As I looked into it more I realized wine making was not the best career choice for me because it was pretty tough to start your own winery — so I became a chemist.

### **Q. How did you become interested in teaching biology?**

**A.** Chemistry was my first love in science, but chemistry is a relatively-mature field. I like discovering new things and being at the edge of knowledge. In my opinion, there is less opportunity for discovery in the field of chemistry. I felt biology was one direction a chemist could go. What I now do is apply my background in chemistry to biology. The type of work I do goes back to my roots of understanding things at the molecular level.

### **Q. Why do you believe the best researchers are often the best teachers?**

**A.** It was an initial observation of mine as an undergraduate student and has held up through my experience.

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**Q. What do you think of the research facilities at UCSD and how do they compare to facilities at other universities?**

**A.** We're definitely a top research institute. We're always in the top ten nationally, and we're definitely a major force in biology. People appreciate that now, too. There's a lot of respect for some of the research going on at UCSD.

**Q. What do you believe are the strengths of the biology curriculum being taught to UCSD students?**

**A.** At the undergraduate level, one of the strengths is that a lot of teaching is done by top researchers. There is a certain perspective one has, at that level of research, that you can never understand unless you're there. The researchers bring that level of excitement and understanding into the classroom. There are a lot of opportunities for undergraduate research because there are many labs. Also, there is a broad range of subject areas students can study. That extra research experience means a lot.

At the graduate level, it's really one of the best departments there is, probably in the top five nationally. We also have a joint program with the Salk Institute which makes the program quite impressive.

**Q. What differences in education are there between universities back East and UCSD?**

**A.** We're a lot less formal, a lot more friendly. On the whole, professors at a lot of schools in the East are unapproachable, much more formal and rigid. Their style is more restrained, distant, whereas we're much more accessible.

**Q. What areas in biology will have significant employment opportunities in the future?**

**A.** Biology has to be one of the best areas to major in right now.

It is recession-proof because most jobs in biology are related to pharmaceuticals.

People always want good health and it's something we're not going to cut back on.

Biotechnology is making a big impact on society. There will be new drugs that will have a significant effect on saving lives. There are plenty of good jobs right now.

**Q. What recommendations can you make to students interested in biology?**

**A.** First, keep an open mind. Try out new things. If you do that, you will probably find the area of science you're most interested in. When you get further on, in terms of being a biologist, you have to be prepared for some stiff competition because biology draws some of the best talent.

**Q. What has been your most challenging research?**

**A.** I think it's what we've been doing most recently. It is the most intriguing because it has been the most complicated. Our studies involve how genes get turned on and off. Most of those studies have been done in fairly simplified systems. We try to reconstruct in the test tube what's actually happening in the cell by assembling very

*"We're always in the top ten nationally, and we're definitely a major force in biology."*

complicated protein complexes in the test tube and analyzing them. It has been a technical challenge to try to assemble these complexes, and a real intellectual challenge trying to figure out what all this means.

**Q. Overall, how would you rate the science program at UCSD?**

**A.** It's very strong; students interested in science can't go wrong.



## NEIL MURRAY

DIRECTOR, CAREER SERVICES CENTER



*Neil Murray came to UCSD in 1982 after having served as director of*

*career planning and placement at the University of Oregon from 1977 to 1980 and as the placement program director at UC Santa Barbara from 1980 to 1982. As the current director of the Career Services Center at UCSD, he ensures that students and alumni get the proper assistance in determining and fulfilling career goals.*

*His insistence that students be provided the best possible advice from staff has resulted in a career center that offers a wide variety of services related to employment and graduate education. Among these are Career Exploration Week, MENTOR, S.L.A.T.E., and WECAN.*

*Aside from heading the Career Services Center, Murray has written numerous publications on career searching techniques and skills.*

study. I recall noticing when I first got here that the students seem more academically motivated and have a more intense attitude toward their studies than all of the other places I've been. I haven't changed my mind after being here ten years.

**Q. What is the most popular service the Career Services Center offers?**

**A.** By volume, the part-time employment part of our program. However, by the time a student graduates, he or she is just as likely to have used some part of our career advising service.

**Q. What is Career Exploration Week?**

**A.** It's a terrific short-term opportunity for students to get exposure to a field of interest. That, in turn, allows them to make a more solid decision about whether or not they want to pursue that field. It takes place over spring break. Students don't get paid, nor do they receive academic credit, but they spend that week in a setting that's up their alley.

**Q. What advice would you give to new students regarding career planning?**

**A.** First, don't get uptight about it. There's absolutely no evidence you have to have this stuff figured out and wrapped up during your freshman year. Secondly, think of your career as a series of bridges rather than a one-way, nonstop freeway. Most people's careers don't look like a straight line. Also, use services while you're a student. At no other time in your life will you have as great an access to high-quality services, covering virtually anything you want. And it's here at your fingertips.

**Q. What can you say about UCSD compared to other campuses?**

**A.** I think this is a great place to work and

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**Q. What industries are covered?**

**A.** It's driven entirely by student interests, so there's no industry that's not possible.

**Q. How does the MENTOR program work and what is its significance?**

**A.** We know that most people get jobs through personal contacts. MENTOR allows our students to take advantage of that fact by putting them in touch with someone in the community who's in their field of interest. That person then serves as a mentor in all the practical aspects of their job search for a period of four weeks, giving advice, suggestions, and, we hope, leads and introductions.

**Q. What is the average starting salary for UCSD baccalaureate recipients?**

**A.** It might edge up to \$25,000 but not much above that. It slowly increases each year, some more dramatically than others.

**Q. Which major had the highest average starting salary?**

**A.** The engineering disciplines in general.

**Q. What trends in the job market do you foresee within the next five years?**

**A.** Demographically, if the economy were stable, this would be a great time to graduate. A higher percentage of our society's jobs require a college degree than ever before. At the same time, our graduating collegiate class is smaller than,

say, five, ten years ago. The competition for jobs is less intense than it was a few years ago, provided that the economy doesn't play tricks on the whole numbers game by shrinking the job market.

**Q. What industry do you think will have a high demand for employees?**

**A.** High-tech will probably maintain its strength. There is growth in biotechnology and the health-care fields as well.

**Q. What can you say about the typical UCSD graduate compared to, say, ten years ago?**

**A.** In the very beginning of that time period we were at the edge of the last group of students who were not particularly career oriented. That changed during the 1980s to a group of students, as a generalization, who gave almost undue attention to careers. It seemed to be their compelling reason to be here. Today's students may be tempered a little bit by the times in which we live. Today's students have a lot going for them. This is not to say they're disinterested in money, but probably have it in a better perspective. They are more interested in happiness than material well-being.

**Q. Why do you enjoy being Career Services director?**

**A.** I like the relationship that an office like this has to the campus. It's a critical

*"Think of your career as a series of bridges rather than a one-way, nonstop freeway."*

campus service and yet you have one foot off-campus in the community, symbolically at least.

Secondly, while it's in the educational realm, there is a tangible result to it. The third reason is that people who come to use our service are motivated to be here.

# PAULE CRUZ TAKASH

ASSISTANT PROFESSOR OF ETHNIC STUDIES

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*aule Cruz Takash grew up on the U.S.-Mexican border in Laredo, Texas.*

*Her father's family came from Mexico during the Mexican Revolution and settled in Laredo.*

*As a young man, her father joined the U.S. Army and was stationed in England, where he met and married her mother. Takash and her family traveled throughout the U.S. and overseas during her childhood.*

*Takash has a doctorate in sociocultural anthropology from the University of California, Berkeley and is now a professor in the new UCSD Department of Ethnic Studies, established in 1991. She describes herself as having worked her way through the educational ranks; she began her education in community college and went to CSU Dominguez Hills before attending UCB. Her research addresses the "Latinization" of California and how white Americans are responding to becoming a numerical minority; Chicano and Latino political mobilization; and Latinas in electoral politics.*

*Her latest publication, "The Social Reproduction of Latino Communities in the United States," is a chapter that will appear in The Handbook of Latino Anthropology.*



**Q. What are your observations about the newly created ethnic studies department?**

**A.** I think it's a dynamic department that provides a kind of scholarship that is increasingly recognized as vitally important. Given the trends that we see all around us, i.e., the issues of multiculturalism and the changing racial and ethnic makeup of the United States, this department is a place where this kind of scholarship can occur. I think it will make an important contribution to academic scholarship and to the public at large.

**Q. You have lectured at several UC campuses; why did you decide to teach at UCSD?**

**A.** I had been considered for several

positions in both anthropology and other ethnic studies departments. I felt that UCSD's ethnic studies department has considerable potential for developing along lines I would like to see.

I think the other members here are especially strong in their particular fields and their research interests overlap with my own. Here I can work on the issues of race, ethnicity, class, and gender in a multidisciplinary framework.

**Q. Are there any observations you can make about UCSD students in general?**

**A.** In the first quarter of instruction most of my students were freshmen. Now I have mainly seniors. Regardless of their student status, most of my students are eager, hard working, and intelligent. They do the work.

**Q. Why is ethnic studies so important?**

**A.** There's a growing realization of the importance of studying issues of race, ethnicity, class, gender, and politics. In a state like California, where there is great ethnic and cultural diversity, there is a tremendous need to develop more scholarship and to educate students on issues that address ethnicity and race.

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**Q. What kind of impact do you hope to have on students?**

**A.** I hope to leave them with a greater appreciation and knowledge of their own ethnicity and the myriad other ethnic groups in society and with a desire to contribute to efforts to eradicate racism, classism, sexism, homophobia, etc. Because students are, say, Irish-American or African-American, I don't assume that they know about their own culture, their own race. I don't assume that any of my students comes to class with a well-developed understanding of racism, of labor history, or a knowledge of the history of specific groups in U.S. society.

**Q. What are the characteristics of students majoring in ethnic studies?**

**A.** More students are choosing to become ethnic studies majors. As far as their ethnicity and race goes, we have a diverse group. But since the major is so new, I think we'll have better profiles in the next few years.

**Q. What has been the focus of your research?**

**A.** My own work has focused broadly on immigration issues.

I realized in the early 1980s that much of the work on immigration is focused on the sending areas, countries that send immigrants. I could see that we needed to understand what happens not only to the immigrant populations in the communities where they end up, but also how the *communities themselves* were responding to immigrants, especially as immigrants

settled and became a permanent part of these communities, and sometimes became more numerous than the original inhabitants. I conducted a case study of how white Americans were responding to becoming a numerical minority, not only attitudinally, but also politically and legally.

**Q. What impact do you think the ethnic studies department will have on the San Diego community?**

**A.** I am hoping our department will help develop a special kind of relationship with San Diego. Although we treat the issues of race, ethnicity, class, and gender in geographically and historically diverse settings, we will also examine how these phenomena are manifested locally. Some of our students will be involved in fieldwork in San Diego neighborhoods and in surrounding regions. This work will not only contribute to their educations but may also be utilized by San Diegans.

**Q. Why did you choose to study anthropology?**

**A.** I had always been fascinated by anthropology. I began to read folklore when I was a child, and later was fascinated with Howard Carter's expedition in the Valley of the Kings and discovery of King Tutankhamen's tomb. When I was in junior college I thought anthropology was just the study of bones and pyramids. I didn't know then the vastness of the field.

*"I don't assume that any of my students comes to class with a well-developed understanding of racism, of labor history, or a knowledge of the history of specific groups in U.S. society."*

When deciding on a major, however, and later, in graduate school, it was the methodology of "hanging out" with people; of listening to and analyzing their everyday experiences and struggles; of the validity of this kind of knowledge that convinced me to choose anthropology over other disciplines. Ethnic studies graduate programs did not exist when I entered graduate school. If they had, I would have opted to be an ethnic studies major instead.

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## KAREN L. KAVANAGH

ASSISTANT PROFESSOR OF ELECTRICAL AND  
COMPUTER ENGINEERING



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*aren L. Kavanagh was brought up in Canada, went to high school in Malaysia, and came to the United States to attend graduate school. Her early interests in science and math eventually spurred her into a career in engineering and materials science in industry and then academia.*

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*Kavanagh joined the UCSD faculty in June 1989 as an assistant professor in the Department of Electrical and Computer Engineering. Last year, she was named a Presidential Young Investigator, a prestigious award from the National Science Foundation intended "to help universities attract and retain outstanding young Ph.D. scientists who might otherwise pursue non-teaching careers." Her research interests include electronic materials—particularly semiconductors—and thin films.*

**Q. You went to high school in Malaysia for two years. How did that come about?**

**A.** My father worked for the Canadian Department of Defense and he was on loan to the Malaysian government to advise them on defense research. It was a very nice cultural experience, and the school was much smaller and more pleasant than the large high school I came from in Canada.

**Q. At what point and why did you decide to go into engineering?**

**A.** I didn't know about engineering as an undergraduate. I went to college with a definite interest in science, but at that time I only knew about physics, chemistry, biology, and math. I learned about

engineering only after I went to Queens University in Kingston, Ontario, Canada. I then went to work for a research laboratory in Ottawa, Bell-Northern Research, the Canadian equivalent of Bell Engineering. So I finally found something that my chemistry and physics fit very well with, and it seemed to be the ideal thing for me to do in graduate school.

After about three years of working, I went back to school, and entered a graduate program, with the goal of a degree in materials science and engineering. I applied to a number of places in the United States, and one school in Canada, and I ended up going to Cornell. I liked the idea of living in a smaller town; and its material sciences department was one of the best in the country.

After five years there, I knew quite a bit about materials science and engineering. I then went on to a postdoc at IBM and spent about a year at MIT in their materials science and engineering department. Then I came here.

**Q. Why did you select UCSD?**

**A.** My particular specialty is electronic materials science, and I knew a number of the professors here and knew their work.



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There was a strong group of people working on electronic materials in the electrical and computer engineering department and I liked the fact that UCSD was not in the middle of a large city. I particularly liked the department and the group of people I would be working with. That's why I came here.

**Q. What impact did being named Presidential Young Investigator have on you?**

**A.** It offered a great source of financial stability and it also was a nice piece of encouragement. I was running out of cash and would have had to do something drastic . . . like fire a graduate student.

**Q. How would you advise young women today about career opportunities in engineering?**

**A.** Right now, the opportunities are there if they want them. They really are. I don't think there are any restrictions in whichever field of engineering a woman enters now. I don't think anyone is stopping anyone from doing whatever discipline of engineering or science he or she wants to do.

**Q. Are the opportunities better now than in the past?**

**A.** Yes, absolutely. People of perhaps not my generation, but women of the preceding generation, have seen some amazing changes. As for myself, I don't think I have ever come across any job discrimination or discouragement to go into science or engineering based on the fact that I am a woman. The bottom line is, if you are interested in science, don't let the future

job worry you. Take the classes you are most interested in.

**Q. What are your principal research interests?**

**A.** I work on semiconductor interfaces, at the last one or two layers of atoms in between a semiconductor and the metal that has contact to a semiconductor. In every device you have to get the electron current from the conductor wires into the semiconductor where the active area of the device is located. I'm interested in understanding more about the details of that process.

I'm also interested in defects in semiconductors, including those existing in a material that can dominate the electrical properties and can determine whether any free electrons in there are available to work in the device. I work on understanding what defects do to electrical current and how to control their formation.

Another one of my interests is scanning tunneling microscopy, which we use to measure properties of metal-semiconductor interface. We are looking at how many electrons from the tunneling tip get through the metal into the semiconductor. That tells us something about the current that transports across that interface.

*“There was a strong group of people working on electronic materials in the electrical and computer engineering department and I liked the fact that UCSD was not in the middle of a large city.”*

**Q. What are the goals of this work?**

**A.** Two goals are better reliability of contacts for semiconductors—higher yields—and more efficient manufacturing.

**Q. Is teaching important to you?**

**A.** You'd be crazy to take a job at a university if you didn't think you'd like to teach. So teaching is definitely part of the job. Teaching is important in that you want to get students involved in your research, and the way you are going to do that is to teach them about the areas in which you are interested.

**Q. One can't help but notice that your office is virtually papered with comics.**

**A.** I like humor, things that are ridiculous. It keeps you from taking yourself too seriously. That's never a good idea.

They're interesting and fun. These are like art—good pieces of wit.

## VERONICA NAVARRETTE

SOPHOMORE, FIFTH COLLEGE

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*Veronica Navarrette, nineteen, was interested in having a small college experience. As the first of five siblings to attend a UC campus, she did not want to attend a university monolith that would dwarf her. She chose UCSD because of its arrangement of five small colleges within the boundaries of a large research university.*

*Veronica is studying communication, while playing an active role at her college. She is co-founder and feature editor of Fifth Dimension, the Fifth College newspaper, and an active member of her college's activities board.*

*The curriculum at Fifth is opening her mind to many world cultures, including her own Hispanic heritage. Her hometown of Visalia is located in the San Joaquin Valley, where her father is a retired police officer and her mother is a teacher at an adult school.*



**Q. In your own words, how would you describe Fifth College?**

**A.** Close knit; very united; it's like a small community. I live in the Pepper Canyon Apartments and everyone knows everyone else, and I like that.

**Q. What about academically?**

**A.** I feel it's challenging and it's rewarding. With such a liberal education at Fifth, you see a lot of students coming in narrow-minded. You see them grow as they learn more and more and, eventually, you see their minds open. I've seen students go from politically conservative to pretty liberal. It has a lot to do with Fifth's educational focus and atmosphere, and I think that's very rewarding.

**Q. What was it about Fifth College that made it attractive to you?**

**A.** Mainly it was the international focus. Fifth's education is unlike any other in the country. Fifth really stood out for me, especially with all the changes that are going on around the world today.

**Q. Students at Fifth take a six-quarter course called "Making of the Modern World" (MMW). How has it influenced the way you view the world?**

**A.** MMW deals with philosophy, history, anthropology, literature. You're dealing with everything all rolled up in one course. And you're learning new things each quarter, but at the same time you're reinforcing what you have already learned.

I think my favorite quarter was MMW 4 because we learned about the Atlantic slave trade and European hegemony. That quarter I had Professor Edward Reynolds (history) and he was just great. We read one of his books. I value that quarter the most because it just put everything into perspective.

Also, we have *Meet the Prof*, where the professor and students have lunch and talk. I think that's a really great program.

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It's interesting because you get to meet the professor and discuss the course together.

**Q. Are certain regions of the world more interesting to you today than they might have been two years ago?**

**A.** India. We learned about Hinduism and Buddhism—religions I find interesting and eye-opening. At one point, I even wanted to study abroad there, but now it's just too expensive.

**Q. Do you think the course has helped you understand what's happening in Europe and the Middle East better today?**

**A.** We're getting to that point now, since we're studying the nineteenth and twentieth centuries. Slowly but surely, things are coming together and you can see why things happen.

**Q. How does Fifth College's curriculum fit into your goals for your major and your career?**

**A.** Right now I'd really love to go into international journalism. With Fifth College's liberal arts background I'll know much more about the world, its traditions, cultures, and societies. I've just become so much less ethnocentric about things.

**Q. How has that helped you in your communication classes?**

**A.** I can't say much, because I've only taken one communication class. I'm just starting my upper-division classes. You'd be surprised how much, for instance, we learned about the printing press in MMW and again in my communication class.

You're able to see the connections and the relations between how societies dealt with things at each time, but you view it differently because of each class.

**Q. You mentioned an interest in studying abroad. What are your plans?**

**A.** I don't want to go away for a year because of the requirements for my major, so I've been looking at internships abroad and summer programs. I'd love to study advertising in London. Unfortunately, financial aid doesn't cover it for the summer.

**Q. One of the requirements for Fifth is a regional specialization. Have you chosen yours?**

**A.** Yes, I'm doing Pan-American studies along with three quarters of Spanish so I can have a minor. So, I'm killing two birds with one stone. Right now I'm taking an upper-division class on Chicano theatre literature, which is an interesting class.

**Q. Why did you choose the Spanish and Pan-American focus?**

**A.** One of the reasons, to be perfectly honest, was to get a minor since I had already taken Spanish. Also, because of my ethnic background. I wanted to learn more about my culture. Both my parents' first language is English, so even though I took Spanish here, I'll never be fluent. I can speak a little, and I enjoy what I know. When I need to know it, I know it. I know enough to get by.

*"Also, we have Meet the Prof, where the professor and students have lunch and talk. I think that's a really great program. It's interesting because you get to meet the professor and discuss the course together."*

**Q. Do you find Spanish a valuable asset living in California? If a student is undecided about a second language, would you encourage him or her to consider studying Spanish?**

**A.** Definitely, not because I have taken it, but because it is so much a part of California. Especially if you're coming to UCSD, because you're going to want to go to Tijuana!

**Q. Unlike most schools, UCSD is on a ten-week quarter system. How do you handle three quarters each year?**

**A.** I've had my good quarters and I've had my bad quarters. I like this system better than semesters. When you go as quickly as we do, you may think it's difficult, but I think it depends on the person. You get so much more done. A person will rise to the level of expectation, and when you're expected to perform a job, you're going to do it. I like the challenge of it, and I think if

I were on the semester system I would get bored really quickly. The quarter system holds my attention; right when I get tired of it, there's a final and it's over with.

**Q. You mentioned that you've had good and bad quarters. What makes for a good one?**

**A.** To plan things efficiently in advance, to make your list, and to take care of all your dirty work beforehand so you don't keep going back and forth—like paying your bills, buying books and supplies, or seeing a play for your theatre class. Efficient planning and an equal balance between work and play, because it's not just studying. You're here to experience life and get to know new people from other backgrounds. Don't overload yourself with work or get too caught up in the social life. It should be balanced to be successful.

**Q. Outside your academics, what do you do to blow off steam?**

**A.** I do aerobics! I strongly suggest that new students take advantage of everything UCSD has to offer. You pay for rec fees and every kind of little fee and you find yourself not going to the university's facilities, and that's one thing I hate to see go to waste. Take advantage of the one-dollar movies, the canoe trips that Canyonview offers, and every guest speaker. As a student, those are the opportunities given to you.

**Q. That sounds like good advice. Some students, on the other hand, may not be aware of what's happening each week. How do you stay informed?**

**A.** If you're passing by a bulletin board, stop for a minute and find out what's going on. You'll see: "Barbeque out in the quad tomorrow." Every year there's FFOG (fall festival on the green), so go to the festivals. Pick up information pamphlets and stop and smell the roses. Just look at what's going on, because it's all there for you.

The beach is just five minutes away. A lot of people come to this university for that reason, but don't find themselves, like me, bothering to take an hour out of their day to sit and relax at the beach. You get so caught up in what you're doing. People waste a lot of time. You'd be surprised how time flies unless you manage it well. UCSD has a lot to offer, it really does, if people would just stop and look.

**Q. Where do you spend most of your free time?**

**A.** Other than the beach and going grocery shopping, I find myself not getting off campus too much. It bothers me, but I don't have a car. There are the bus systems, so if you plan a day in advance you can take the bus downtown or wherever. You can find yourself getting kind of suffocated because you haven't seen Highway 5 in a long time. That can be a problem. If it's important, though, you can always plan a day in advance to make sure you get off campus.

**Q. What would you be doing on a typical Friday after class?**

**A.** The Pepper Canyon Apartments are like their own little neighborhood, so I usually go apartment hopping. But if I were just walking around campus on a Friday afternoon, I'd probably hang out at the Price Center at Espresso Roma. There's a lot going on at the Price Center. There's a theatre and little restaurants and stores. I usually see a lot of my friends there.

**Q. The Price Center is sometimes called "the living room of campus." Do you feel that's an accurate description?**

**A.** I'd say it depends. The Hump attracts a lot of people too. It's a nice, calm area where it's grassy and shaded. Sometimes there's a band playing, or people playing African music with drums. You have the student-run co-ops there. Also, the way UCSD is structured, you have your main area to hang out in each college. Other than that, there really isn't much else besides the Price Center and the Hump.

**Q. It sounds like Fifth is still growing, with lots of opportunities to get involved with new projects. Is that part of the appeal of Fifth College?**

**A.** Yes, I think it is being a part of it—watching Fifth grow. In a way, we're a part of history. For instance, there are so many different opportunities that relate to the focus of Fifth, such as the cultural exchange program. It adds to what Fifth set out to do.

# DEVIN MATHIOS

SENIOR, REVELLE COLLEGE



*Looking back on his high school record, Devin Mathios admits he was not a UC-caliber student. He knew, however, that he eventually wanted to prove himself in the University of California system. He concentrated on his academic interests at De Anza Community College, later transferring to UCSD's Revelle College.*

*Unlike most transfer students, Devin chose to live on campus. Finally, at age twenty-two, he was having the college experience he longed for. Devin became very involved with campus activities. He chaired Revelle's Faculty-Student Program Board, joined the Alpha Kappa Psi business fraternity, and became captain of his intramural softball team.*

*Not only did Devin master the social side of college life, but he also excelled in the classroom. He is majoring in economics (one of UCSD's most popular majors), with a minor in U.S. history. Back in his hometown of San Jose, his mother is an elementary instructor in special education and his father is facilities manager for a data systems company.*

**Q. You started college in your hometown at San Jose State University, later transferring to De Anza Community College. Tell us about your experiences as a transfer student.**

**A.** The community college system is a great opportunity for students. I was a good high school student, but I wasn't a UC-caliber student. So, I was really given a second chance to have a UC education.

I started at San Jose State because it was local, but I really didn't get the kind of experience I was looking for. Being a commuter, I didn't feel like I was involved, so I left and went to De Anza. I knew where I wanted to go and this would be the best way to get there, because California community college students get transfer

priority when it comes to the UC system. It was a good experience and I got a lot of my course requirements out of the way. But my best experience, so far, has been here at UCSD.

**Q. What UC campuses did you consider?**

**A.** I was thinking about Berkeley primarily, and I kind of orientated my general education around it. When I came to Revelle I realized that I had a lot of requirements still unfulfilled. Originally, I didn't realize what I was getting myself into by coming to Revelle. When I saw the requirements, I felt a little intimidated and I even thought about leaving. But once I got into the Revelle community, I really liked it—the classes didn't seem as intimidating anymore.

In retrospect, I'm glad I did it because I took a lot of classes I may not have taken on my own, subjects that I feel you have to know to be an educated person (physics and humanities). I think we're very fortunate at Revelle to have some of the best professors in the whole university, people like Jonathan Saville (theatre) and Paul Saltman (biology).



**Q. Let's go back a little bit. At first you were looking at Berkeley. When did you start looking at other UCs, and San Diego in particular?**

take advantage of at the community college level. It's a really great resource. As it turns out, everything worked out all right.

**Q. Revelle is often viewed as a science college, yet you chose it for a major in the social sciences. How does economics and Revelle fit together for you?**

**A.** The math part meshed really well, because

economics on this campus is very math-oriented. It's often called applied math.

Revelle doesn't usually attract a lot of non-science majors, especially if they're transfers, because there is a ton of requirements to fulfill. It's definitely a science school, but I like that because I took a lot of classes I wouldn't have taken otherwise. Science majors are hard working, and to be in their environment makes me a better student. It teaches me better study skills and things like that.

**Q. What sort of courses have you taken that you feel you may not have been exposed to through a different program?**

**A.** The humanities sequence, which has some of the best professors in the entire university. I was exposed to works like John Milton's *Paradise Lost*, in-depth study of the Bible, even something obscure like the *Bhagavad-Gita*, which concerns the faith of Hinduism. It may not be useful in everyday life, but I just feel better knowing it.

I'm taking physics now, which I probably wouldn't have taken on my own. I'm really glad I know it because it helps me

make sense of certain things. I took another quarter of calculus here, because it was required. Revelle has a four-course foreign language requirement, which forced me to re-study something I had studied in high school, so I've achieved a certain proficiency in French now. A lot of tools here have made me a well-rounded person, in the whole motif of Revelle College.

**Q. If you were going to explain Revelle to someone who doesn't know much about UCSD, what do you think you'd tell them?**

**A.** It's a very structured environment designed to expose people to everything. You're going to get an in-depth study of calculus; you're not just going to take two quarters—you're going to take three quarters. You're going to get an in-depth study of chemistry and a foreign language. I think it's ideal for people who are undeclared, because they are going to get exposed to everything. It's very rigorous too. Some of my humanities courses really forced me to work and to improve a lot of my writing skills. Revelle took me to a higher level, to a higher expectation. I think that's the key thing: They expect a lot out of a Revelle student.

**Q. Let's talk more about your major. What do you think about the economics program at UCSD?**

**A.** It's very mathematically based, and there's no way around it. UCSD is often perceived as a science school, and while economics is considered a social science, the faculty here want to make it as much of a science as they can. I've had some fantastic professors and some professors

*"Some of my humanities courses really forced me to work and to improve a lot of my writing skills."*

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**A.** The summer before my senior year, my parents and I did a campus tour and the San Diego campus really impressed me. It's a nice environment and a nice place to live. I didn't want to stay around San Jose anymore, so I decided to come here. I'm glad I did because I really like the area, and I don't have to put up with a lot of things I'd have to put up with at a school like Berkeley. The environment here is very conducive to living, and I think that's a reason UCSD attracts a lot of the top professors—because they want to live in La Jolla.

**Q. As a new student here, you said Revelle had a few surprises for you. Tell us how that happened.**

**A.** I didn't have all the information, probably because UCSD was originally my second choice and I didn't put the time into it. I had followed a program called *transfer core curriculum*. It's supposed to satisfy the GEs for any UC campus, except I didn't read the fine print that it excluded Revelle and Fifth colleges. It was a mistake on my part; anyone who is transferring should talk to a counselor. I'll admit that is one thing I didn't

that I wished I hadn't taken, but I guess that's the reality of it.

If I were going to complain, I'd say the major is almost too mathematical and too theoretical, which is often a complaint at all the UC campuses. We lose touch when we go into Lagrange multipliers with what we're really trying to do.

The Department of Economics offers a lot of choices with a good selection of classes to orient you to what kind of concentration you want to do. There is the QEDS program for people who are more into computers and going into more of a management area, more into actuarial work. And there are a lot of classes on economics of the Third World—like economics of taxation, which is a class I'm taking now. What I've noticed is that the more mathematical classes have the best professors—Professor Mark Machina and Professor Vincent Crawford are just two of them. In the field of economics, some of the heavy hitters are the best professors anywhere.

**Q. You've mentioned a lot of faculty by name, which shows you have taken the time to get to know some of your professors. As chair of Revelle's Faculty-Student Program Board, what kind of interaction do you feel is possible between students and faculty?**

**A.** Since working with the Faculty-Student Program Board I've learned that students, for the most part, underutilize the faculty. Some of my classes have 300 students. When you're in a lecture hall, it's often very intimidating to go up to someone who may only know you by number. I think that's a

wrong perception of a lot of students. I'll be the first to admit it's hard to overcome because I've made the same mistake.

Through the program board, I've overcome a lot of my fear of faculty. I'm also utilizing professors' office hours a lot more and realizing that a lot of professors are happy to meet with students. They like it.

**Q. At Revelle, you are required to take a minor in a field unrelated to your major. What are you taking, and why did you choose it?**

**A.** U.S. history, partly because it fit some of the classes I had taken earlier, and I have an interest in history. My future may hold law school, so I figure an introduction to history and the fundamentals of law would serve me well later on.

*"The Department of Economics offers a lot of choices with a good selection of classes to orient you to what kind of concentration you want to do."*

**Q. What resources do you turn to when you need help or assistance on a project or a report?**

**A.** TAs (teaching assistants) are extremely helpful. Often a lot of them are not very far from their own undergraduate years, so they realize what it's like and are often very helpful.

OASIS, a tutoring center, is helpful too. In fact, I had a really good experience with an OASIS tutor from Princeton who taught me better than in lecture. It just made sense. It's too bad he's gone now. I think that was a really good experience and he helped a lot of people get through that class.

And professors. Let's not leave them out. A lot of times they're very willing to help, but the thing I've noticed about professors is that their time is extremely valuable. You really have to have good questions and be ready to go. You can't say, "I don't understand this." You have to be really prepared. Also, my roommates have been quite helpful. Living with science majors has been a bonus.

**Q. Let's change direction and talk about your life outside academics. What do you do for fun?**

**A.** I'm into athletics and cycling. There's a really nice ride up to Oceanside and going down Torrey Pines to the beach. Also, there's some extremely beautiful snorkeling here.

The intramural program is extremely strong here. There are a lot of different sports, like over-the-line softball, which is something I had never heard of before I came here. I had a really fun time playing. It's like softball for lazy people. There's no

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running involved. No gloves either. You just hit. It's a real finesse game. I think it started in San Diego. It's not a big sport yet, but it's growing. It's the kind of sport that really grows on you, and it's a lot of fun too. It's not ultra-competitive.

Softball is also great, because it gives you a chance to get all your friends together. My friends are all over campus, so if you can get an IM team together it gives you that time every week to do something fun. Otherwise, to get everyone together would take a lot of work.

**Q. What tips do you have for other transfer students?**

**A.** Use your counselor from wherever you're transferring from. It can be a sticky process. Try to fulfill as many requirements as you can at the community college because classes at UC are much harder. Get your calculus series and chemistry series out of the way ahead of time. The fewer classes you have to take here, the quicker you'll graduate.

A lot of transfers call it a trap, because you get here and you've bought a car, so you have a car payment, so you have to work, and school takes a low priority. They end up taking a quarter off, saying that they can always go back. Then they get behind, and this or that course isn't offered.

Right from the start of community college you have to define your objective and stick to it, because you have a lot of things to get accomplished in those two or three years there. There are a lot of other distractions in life that can really get you off course. As I said, community college is a great second opportunity for people to come to UC, but there are a lot of things you have to do. The key point is that you want to be prepared. Really understand what you're getting yourself into.

As far as any other advice, try to get involved on campus. It can be a lonely place if you don't have a base of friends. Try to get some kind of activity in. There are hundreds of student organizations that are looking for members, new ideas, and some diversity in their group. Really look at the five colleges and see which one defines your philosophy, because I think that's one of the advantages of UCSD. Usually, you'll find a college that matches you.

**PAULA HUDSON**  
FRESHMAN, THIRD COLLEGE



*A summer vacation in nearby Orange County enticed Paula Hudson to explore colleges in Southern California. She was attracted by the San Diego campus partly because of its academic reputation, but also because of its idyllic location and temperate climate. Leaving her home in Portland, Oregon was a step she knew she must take.*

*Paula, an eighteen-year-old freshman, is majoring in chemistry at Third College. She quickly became a familiar face on campus when she volunteered to take part in a hypnotist's show—performing on stage as Madonna! Paula, however, is no “material girl.” During her first year at UCSD she has looked deep within herself for the strength and motivation to succeed. She says the key word at college is “independence.”*

*Her family is deeply involved in higher education as well. An older brother is a senior at the University of Chicago. Back home in Oregon her mother works for the Governor's Commission on Higher Education, while her father teaches English at Portland Community College.*

**Q. You are a freshman, so your own college search may still be fresh in your memory. What do you recall about that process?**

**A.** My brother is in college, so I was aware of how difficult it was for him to choose a college. I didn't have any clues as to where I wanted to go until I spent the summer before my senior year in Villa Park in Orange County. I realized that I really liked Southern California. I have one cousin at UC Riverside and another at UC Santa Barbara and my uncle said that San Diego is the best. I was accepted by all three, but this one really touched me.

UCSD is a highly ranked academic institution, close to Berkeley in ranking, and the campus is beautiful and right on the

ocean. You can't beat it. I first visited the campus in January, and it was so funny because I left snow at home.

**Q. What was your long distance attraction to UCSD?**

**A.** The two universities closest to my home are the University of Oregon and Oregon State, but I didn't want to be that close. My brother went to Chicago, and I have relatives nearby. I'm away from home and I like the independence. I think going to college is a big step. It's a growing experience that needs to be taken. Sometimes I think people who go home every weekend are missing out. My parents knew it was an important step to take too. The only problem is the out-of-state tuition.

**Q. Expenses are an issue for most students. How do you handle the financial side of college?**

**A.** I applied for scholarships and financial aid. They projected I would receive about \$3,000, but I ended up getting \$109, which was hard to accept, especially with my brother in college too. It's expensive, but I have my savings and I'm paying for the rest of the year. My parents and I have split it down the middle, but I don't know how much money they are going to be able to

give me next year. I'm going to get a job and take it one step at a time. I have to. I would not want to drop out of college because of finances.

**Q. Do you have any tips for students who are going through the financial aid process for the first time?**

**A.** Write down everything. A lot of people don't think they can qualify, but even if you think your parents are in

a high income bracket, still apply because you never know what's going to happen. There are so many scholarships out there, but people never apply for them because they think, "I'm never going to get it," but definitely do. If you need the money, then do it.

**Q. Before coming here, what was your image of UCSD?**

**A.** I hadn't heard that much about it. I thought it was another surfer school because it's right on the beach. It's fairly new for a UC school, so the more that I hear about it the more I'm surprised that I

got in. I'm glad that I have the chance to go to this institution.

**Q. What's it like now that you're here?**

**A.** I never realized how great it could be. I'm living with seven other girls. After three months I feel as if I've known them my entire life. It's amazing the friends you meet and how quickly you form such strong bonds with people. It's great. School is different—classes are hard!

**Q. Was that a surprise for you coming from high school?**

**A.** Everyone says that college is so much more difficult. I thought how hard could it really be? It is. When they say two hours' studying out of class for every hour in class, they mean it. And I think that is an understatement in some respects.

There are things you learn really fast here, such as good studying techniques. In high school, I might study for a test, but here you start a week ahead—a couple of hours every day. You have to form a balance between going out and having a good time and sitting down and studying. It was really difficult to do the first quarter. The beach is right there. It was hard to do, but you learn really fast.

**Q. Tell us more about life in the residence halls.**

**A.** It's like a home. On each floor there are two double rooms, four single rooms, a suite (which is like a living room), and one bathroom. Eight girls in one bathroom—it works out. We're all really different but we

*"There are things you learn really fast here, such as good studying techniques."*



still have the ability to get along. I feel like I really fit in with everyone.

The guy-to-girl ratio isn't very good—we have two suites with guys and six suites of girls. When we first got here we'd all hang out off the balconies and talk. It was so much fun.

During "Welcome Week" there is something going on every night and day, like barbecues with burgers. You want to meet new people and everyone has a different background. I think the residential life office does a really great job of getting people together.

**Q. There's a lot of talk about how our five colleges provide a small college atmosphere within the larger university. Do you think that's an accurate statement?**

**A.** Definitely. People say it's the size of a small city with 19,000 undergraduates, not to mention graduate students, teachers, and everybody else. In my college, however, I feel like I have my own little family. In my suite I have my "sisters," and I have more older friends than I've ever had before.

You meet people from other colleges too, so it's not like I'm restricted to Third College. I have at least two friends from every college, really close friends. You get around the campus because you have classes everywhere and you're able to go to parties. I guess the campus is huge, but you can walk from one end to the other in

about fifteen minutes, so it doesn't seem as if it's too big.

**Q. Where are your favorite hang-outs?**

**A.** Revelle Plaza because there are so many vendors. It's fun to sit by the fountain and see everybody that goes by. I'm a big people-watcher.

I like the roof too. You can go up on top of our buildings and see the ocean, which is an added incentive for going to Third College. It's a big open space and the sun beats down. It's quiet and you can see the ocean and feel the wind and sun.

**Q. As a self-described people-watcher, how would you describe our student body? Are there common denominators among all students?**

**A.** There are so many kinds of people and it's so surprising that everyone fits together. Third College seems to be surfers. There are the overly intellectual people in one area, then there are the surfers, the societies, the fraternities and sororities—and there's the Ché Cafe, which is a totally different atmosphere altogether.

**Q. Let's switch gears and talk about your college. Do you remember why you chose Third?**

**A.** I think it was the main GE courses, for example, "Dimensions of Culture." One thing that really interested me about Third is its focus on being an individual and learning about other cultures—becoming less prejudiced and more open. I didn't see that at the other colleges.

*"When they say two hours' studying out of class for every hour in class, they mean it."*

**Q. Why was Third's philosophy—this idea of understanding other cultures—so appealing to you?**

**A.** I think it's really important. When I was younger I went to a practically all-black school where I was in the minority, so I've grown up thinking that everybody is cool. Also, my parents want me to be aware of other cultures. It's really scary that there are so many people who aren't. I don't think they're hard-core racists, but prejudice exists. I'm trying to learn to overcome that and to help other people realize that there are prejudices out there so we can dispel some of them. That's why I chose Third.

# TRACI POWELL

SENIOR, WARREN COLLEGE



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*As a child Traci Powell knew her body was not functioning properly, but no one could tell her why. Now, at age twenty-two, she knows her condition is Friedreich's ataxia, a progressive neuromuscular disorder. During the time her diagnosis remained cloaked in mystery, Traci developed a deep desire to understand how the body works, not only for her own edification, but also to help others who must confront the unknown.*

*While completing her senior year at Warren College, Traci wound up the long process of applying to medical schools. She also was involved on campus as activities coordinator for the Disabled Students Union, a feature writer for the student newspaper The Guardian, and an intern for Warren's Multicultural Enrichment Program. In her spare time she enjoys swimming and horse-back riding.*

*Traci is a San Diego native who attended Morse High School. Her family, which includes four brothers and a sister, lives south of the city in Bonita, where her father is a test technician for a turbine manufacturer and her mother is a communication specialist for the Navy Public Works.*

**Q. The most popular major at UCSD is general biology, which you're studying as preparation for medical school. What is your interest in pursuing a degree in medicine?**

**A.** I've always been interested in biology and how the body works, and why it sometimes doesn't work correctly. I've always been interested in helping others get well, to overcome illness. So, I decided that being a doctor would be the best way I could achieve my goals.

**Q. Presently, you're looking at several medical schools. Describe how you've approached the application process.**

**A.** It's very involved and you really have to be dedicated. It starts a couple of years

before you even plan to begin medical school. The MCAT itself requires a great deal of preparation time. I think the best way is through a preparation course, which really helped me. Obtaining faculty recommendations also can be a difficult task.

The AMCAS application, which is a central application sent out to all medical schools you apply to, also is very time consuming. A concise personal statement is required where you have to fit your whole life on one page! After all that, you get secondary applications from each school.

I've applied to twenty-one schools, and now I'm waiting to hear back from them.

**Q. That sounds like a lot of work. Is there anyone to provide assistance during this lengthy process?**

**A.** I went to the Career Services Center and also to our School of Medicine for advice on my personal statement. There's a videotape on how to fill out your application, so I watched that and had several people read my statement.

**Q. You said you applied to twenty-one schools. Isn't that expensive?**

**A.** Each application costs between \$40 and \$50. You could get a fee waiver if you

qualify, but you have to qualify! So, I started saving for it about a year ago, because I said, "It's coming up; I'd better be prepared."

If they're still interested in you after reviewing your application, then they ask you for an interview. You have to go to that school—wherever it is. I was in St. Louis for one day for a two-hour interview! And I was in Oklahoma for less than twenty-four hours, and my interview was only forty-five minutes.

**Q. How do you find time for interviews, while still keeping on top of your school work and other responsibilities?**

**A.** It's hard to fit it all in, because they ask you to come to the interviews during the middle of school. I let my professors know when I'm going to be out. Last quarter I had to miss a lab, but my professor was really nice about it. This quarter I had to miss a class which meets only one day a week. It has all worked out so far, but I've heard horror stories about people who had to take incompletes because they missed so much school because of interviews.

**Q. How would you advise someone who's thinking of going through this process?**

**A.** To know about things ahead of time—even a year before they're going to happen. I've always known that I wanted to be a physician and when I was a freshman it seemed so far away, but I would still go to all the seminars at the

medical school and career center. I was keeping myself aware of what was going to happen.

I'd also advise people to do everything early. Take the earliest MCAT possible, like in the spring. Do your application during the summer and only work on that when you have a lot of free time. I worked on my application for one and a half months during the summer.

**Q. Such an involved process must be distracting at times.**

**A.** You also have to prepare for your interview, and I did several mock-interviews with people on campus. I had this list of questions that I just kept going over and over. I also did research on the schools so I'd know more about them. Every step just takes so much time.

**Q. You've dreamed of being a physician since childhood. What triggered your interest?**

**A.** I think my neurological disorder confirmed it. I was always going to different physicians, mostly neurologists. I wasn't diagnosed until I was nineteen, but I had some problems even earlier. They weren't sure of what it was, but I now know it's *Friedreich's ataxia*, a progressive neuromuscular disorder. For me, the curiosity came when I asked questions my doctors couldn't answer. I wanted to know. After I was diagnosed, I wanted to be in a position where I could help others like me.

*"I've always known that I wanted to be a physician and when I was a freshman it seemed so far away, but I would still go to all the seminars at the medical school and career center."*

**Q. So, it became a very personal pursuit for you to learn more about your own disability and to be in a position one day to help others. Tell us about your experience while living on campus.**

**A.** It has been difficult at times because of the size and terrain of the campus, but Disabled Student Services (DSS) has been really helpful to me. DSS has provided me with a variety of services, including the loan of the scooter I use to get around campus, note-taker services, and on-campus transportation (the Campus Loop shuttles are not wheelchair accessible).

Because of my disability I cannot write quickly, so I rely on classroom note takers. I also take my tests separately because I need extra time to finish. Most schools don't have what we have here in terms of services for disabled students, so we're very fortunate at UCSD.

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**Q. With five colleges to choose from, why did you go with Warren?**

**A.** I like the well-roundedness of having two noncontiguous programs of concentration. It forces you to go into different areas besides your own major focus—mine are black American music and health care and social issues.

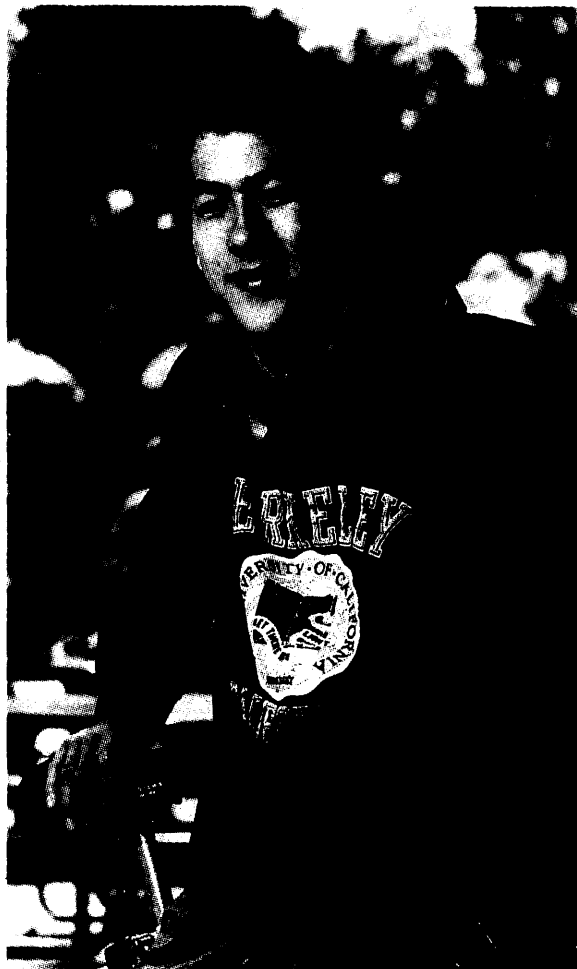
Health care and social issues is a perfect minor for me because it allows for diversity. For example, I've taken classes in psychology, sociology, anthropology, and philosophy. It's made me well-rounded by exposing me to areas related to medicine and health.

**Q. What words of encouragement do you have for a disabled student who is a little apprehensive about going on to college?**

**A.** I'd say do whatever you want to do. Don't let anyone discourage you from achieving your goals. You never know how much you can do until you actually do it. People have tried discouraging me from becoming a physician; however, when they see what I've accomplished then they start to take notice. I encourage students to follow their dreams.

## ROBERT CHOY

SOPHOMORE, MUIR COLLEGE



*Like many of his classmates from Berkeley High School, Robert Choy had plans to attend an Ivy League school back east. Having his hopes dashed was a traumatic blow that forced Robert to rethink his plans for college. He finally chose UCSD and Muir College because that selection catered to his independent nature.*

*His transition from the Bay Area to Southern California has not been easy. Robert, who is nineteen, misses the cosmopolitan flavor of his hometown. Here he takes relish in San Diego's near perfect climate, and the fact that UCSD's biology program is one of the best in the country. As an honors student he was awarded a Regents Scholarship, which is the university's most prestigious scholarship.*

*Robert is no stranger to the UC system. Not only did he grow up in the shadow of the UC's flagship campus, but his father also works in the Berkeley Chancellor's Office. His mother is an educational consultant.*

**Q. Tell us about your college search and the various campuses you were investigating.**

**A.** Well, to be totally honest, UCSD was my third or fourth choice. My first choice was Harvard, my following choices, MIT and Brown. I had already heard about getting into the UCs much earlier—around February or March, I guess. I didn't find out about the eastern campuses until April. So, I already had this school in the bag and I was just waiting to find out about the others.

I also applied to UCLA, Santa Barbara, and Santa Cruz just in case. But, there was never any doubt in my mind that I would get into the UC schools. I was real disappointed, however, to find out that I

didn't get into any of the eastern schools. Actually, I was wait-listed for a while at Harvard, almost to the point when I graduated. So, it was really traumatic when I found out that I didn't get in there.

**Q. So, your heart was set on attending an Ivy League school back East. How did you refocus and think more positively about making the decision to come here?**

**A.** It was really hard, but I guess my advice to people who are going through the same thing now is that even though it seems like it's going to be this monumental change in your life, if you don't get into a particular school, your life is not going to end. Wherever you go, just try to fit in. If it's really bad you can always transfer. Whatever happens, it's not the end of the world. One thing that immediately made things easier for me is that I really got along with my roommate.

**Q. Why were you so serious about the eastern schools?**

**A.** I guess it was the prestige. And, all my friends were applying to those schools. My parents said they could afford to send me to any of those schools, and, if I could get in, it would be worth it.



In retrospect, it really hasn't been that big of a deal. Obviously, I'm not missing out on anything great.

*"Muir also has a lot of activities that make it easier for you to meet people."*

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**Q. In comparison to the other schools you've mentioned, what stood out about UCSD?**

**A.** I was pretty sure that I wanted to study biology, which was the biggest factor in coming here. I knew UCSD is really, really strong in biology, mostly from reading the *Catalog* and literature from the biology department and from talking to my family and teachers. My counselor's son came here also, and he strongly recommended San Diego over the other UCs.

**Q. Did you visit the San Diego campus before applying?**

**A.** Yes, I visited during spring vacation of my junior year. I guess I was touring a lot of campuses because they all started to blend together. A couple of things that really stood out in my mind about UCSD were the *Sun God* and the Central Library. The *Sun God* is so exotic.

**Q. You said the biology program was probably your main attraction to UCSD. Now that you're here, tell us about the program.**

**A.** I've only taken three classes in the biology department, and I don't have any complaints about the professors. In fact, I thought they were all pretty good. The one drawback right now is taking all the

lower-division and general-education requirements. All those classes are 300, 400 to 500 people. That can be bad at times, but it doesn't bother me as much as it does a lot of people who need personal attention. I can get along okay in a big lecture because I can get help from the textbook on my own.

**Q. Why do you think you handle the large classes so well? Do you have any tips for other students?**

**A.** I think a lot of people get intimidated because they think if there are 500 people in this class some students are going to be a lot smarter than I am. I really don't let that bother me too much. I just try to work on my own and see how I do against the rest of the people. Also, I think I've been able to get a lot out of my reading and notes—stuff that other people don't use. I think I have an easier understanding of some things.

**Q. How have you managed to stay on top of your class assignments?**

**A.** I generally go to discussion sections, which I have found helpful. You hear a lot

of horror stories about bad TAs, but I haven't had too many experiences like that.

**Q. Have you had much direct contact with your professors?**

**A.** No. I'm not one of those people who sits in the front row and asks a lot of questions, but I like to ask questions if there is something really complicated to understand—to see if the professor is totally prepared. I've tried asking the professor hard questions, so he has to sit there and think about it.

**Q. Research is a driving force on this campus. Do you have any plans to get involved with a research project as an undergraduate?**

**A.** Yes, because research is something I think I want to get into later, maybe as a career. I want to get as much exposure to research to see if that's what I really want to do. I'm thinking about getting a job in a lab to get some experience and to meet some faculty members. I know that later on I'll be applying to graduate school and the most important thing is having recommendations from important faculty members.

**Q. What do you see as the true advantages of UCSD's college system?**

**A.** Oh, the colleges are my thing! They made a really big difference. A lot of my friends went to Berkeley where there are twice as many students. Here the colleges make so much difference in terms of making the campus smaller, in terms of how people live together.

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Last year I was living in Tioga Hall and, even though it's a ten-story building, the way it's divided into houses—every two floors is one house—gives you about seventy people that you automatically have something in common with. It makes you feel more comfortable. That makes a big difference because the college is smaller and not so overwhelming.

**Q. Was Muir your first choice for a college here?**

**A.** Yes, Muir was my first choice, and I mostly based my decision on what I got from the *Catalog* about the different colleges. I think it describes the colleges pretty well.

**Q. What would have made your decision easier back then?**

**A.** The *Catalog* tells you what you have to take for the general-education requirements, but it doesn't describe exactly what that's going to entail. I got lucky because from my own experience here I still would have chosen Muir.

**Q. What makes Muir a good fit for you?**

**A.** Academically, it's the general-education requirements. They're not constrictive as, for example, Revelle. I didn't want to be forced to take a certain subject. I wanted to be able to make up my own mind. At Muir you can pretty much take anything to satisfy your GEs.

**Q. That kind of flexibility places more responsibility on you. How do you handle that?**

**A.** I like to make up my class schedule on my own, but I always make a point of going to an adviser beforehand to see what he or she thinks. I'm interested in getting feedback and some reassurance to make sure I'm not making a mistake.

**Q. Was your college orientation program helpful?**

**A.** I thought orientation was really good. I really liked the guy that I was rooming with. We got along really well, and we actually stayed friends. Muir also has a lot of activities that make it easier for you to meet people.

**Q. You're taking part in your college's honors program. Tell us more about that.**

**A.** Well, I think it's a good program. It's good to talk to the faculty to find out what their research fields are—just to see what's going on on this campus. You always wonder what the professors do in their spare time. You know they're in the lecture hall for an hour a day, but what are they doing for another six or seven hours a day and on their own time.

**Q. Are there any special privileges you enjoy as an honors student?**

**A.** The biggest advantage has been being able to T-reg [telephone register] before anyone else. Because I get to start T-regging on the first day makes an enormous difference, especially in my major because so many of the classes are

impacted. You know, all my friends are constantly trying to crash courses. It's such a big difference not having to worry about your schedule at all, knowing that you're going to be able to take whatever you want to take, when you want to take it. I can't stress enough how big a difference that's made.

**Q. What's it like studying on a ten-week quarter system?**

**A.** I like the quarter system because you get it over with quickly. I remember classes in my senior year of high school and the semester just kept going on and on. I like the fast pace here. I like getting it over with and then you don't have to worry about studying during your vacation. Once you're on vacation you're done. You can just totally relax and not worry about anything.

**Q. What qualities are necessary to achieve success at UCSD?**

**A.** I think you have to be independent, just because of the size of the campus and classes. Here you really have to take control of your own destiny and not slack off. I see that happening to a lot of people. It's not that they're expecting it to be handed to them, they're just not on the ball all the time. They end up flaking and that can cause a lot of problems, so I think you really have to be able to take control and take care of your business on your own.



# COURSES, CURRICULA, AND PROGRAMS OF INSTRUCTION

## KEY TO COURSE LISTINGS

Courses numbered 1 through 99 are lower-division courses and are normally open to freshmen and sophomores.

Courses numbered 100 through 199 are upper-division courses and are ordinarily open only to students who have completed at least one lower-division course in the given subject, or six quarters of college work.

Courses numbered 200 through 299 are graduate courses and are ordinarily open only to students who have completed at least eighteen upper-division units basic to the subject matter of the course.

Courses numbered 300 through 399 are professional courses for teachers, which are specifically designed for teachers or prospective teachers.

Courses numbered 400 through 499 are other professional courses.

Sample Course Listing:

**100 (see above) Title of Course (4) (number of quarter hours or units of credit)**

Course Description. Prerequisites: [listed]. (F) [Quarter the course is taught].

## ACADEMIC INTERNSHIP PROGRAM

OFFICE: Literature Building, Second Floor, Warren Campus

### THE PROGRAM

The Academic Internship Program (AIP) offers qualified juniors and seniors, in any college at UCSD, the opportunity to gain experience related to their major field of study while working full- or part-time in an off-campus placement. Placements are designed to correlate with students' career goals.

Internships are available in a wide variety of settings: TV and radio stations, law firms, medical research labs and clinics, government agencies, high-tech companies, engineering firms, business organizations, and numerous other fields. Students can also work with the internship office to set up their own placements.

Although most placements are in San Diego County, the AIP provides internships in Washington, D.C. and Sacramento with congressional and government offices, consumer interest groups, and media organizations. UC-sponsored housing is available in Washington, D.C.

In an internship, students can work from ten to forty hours a week for one or more quarters. They can earn a maximum of sixteen units of credit which may be taken in increments of four, eight, or twelve units per quarter. Students may also choose a zero-unit option. Internships are available in the summer as well as during the academic year.

A faculty adviser oversees the academic component of the four-, eight-, or twelve-unit internship, which consists of writing a research paper/project. The faculty adviser may also choose to assign relevant readings. Zero-unit internships do not require a faculty adviser.

The Academic Internship Program is a valuable form of professional training which provides students the opportunity to test their career interest in an off-campus setting.

Students planning an academic internship should apply to AIP at least one quarter before they wish to be enrolled in the program, or two quarters prior to Washington, D.C., internships. Students have the option of undertaking one or more academic internships during their junior or senior year. Students must have completed ninety units, including some upper-division course work, and have at least a 2.5 GPA at the date of application.

### 197. Academic Internship Program (0-12)

Individual placements for field learning which are integrated with academic programs will be developed and coordinated by the program. A written contract involving all parties will include learning objectives, a project outline, and means of supervision and progress evaluation, and must be received prior to the beginning of the internship. Prerequisites: consent of instructor and submission of a written contract.

## AFRO-AMERICAN LITERATURE

See Literature.

## ANTHROPOLOGY

OFFICE: 8029 Humanities and Social Sciences Building, Muir College

### Professors

F. G. Bailey, Ph.D.

Roy G. D'Andrade, Ph.D., *Chair*

David K. Jordan, Ph.D.

Michael E. Meeker, Ph.D.

Theodore Schwartz, Ph.D.

Melford E. Spiro, Ph.D., *Professor Emeritus*

Shirley C. Strum, Ph.D.

Marc J. Swartz, Ph.D.

Donald Tuzin, Ph.D.

### Associate Professor

Fitz John P. Poole, Ph.D.

### Assistant Professors

Guillermo Algaze, Ph.D.

Suzanne A. Brenner, Ph.D.

James Holston, Ph.D.

Tanya M. Luhrmann, Ph.D.

James Moore, Ph.D.

Marcelo M. Suárez-Orozco, Ph.D.

### Associated Faculty

Edwin L. Hutchins, Ph.D., *Associate Professor, Cognitive Science*

Martha Lampland, Ph.D., *Assistant Professor, Sociology*

Paula F. Levin, Ph.D., *Lecturer, Teacher Education Program*

Robert A. Nemiroff, M.D., *Clinical Professor of Psychiatry and Director of Resident Training*

Lawrence A. Palinkas, Ph.D., *Associate Professor, Community and Family Medicine*

Lola Romanucci-Ross, Ph.D., *Professor, Community and Family Medicine, UCSD School of Medicine*

Christena Turner, Ph.D., *Assistant Professor, Sociology*

Kathryn A. Woolard, Ph.D., *Associate Professor, Sociology*

Anthropology is a humanistic social science dedicated to understanding the worldwide diversity of social institutions and cultural traditions. Because there is increasing awareness of the importance of sociocultural factors in domestic and international relations, a bachelor's degree in anthropology has become accepted as a valuable preparation for careers in law, medicine, education, business, government, and various areas of public service. Anthropology majors can qualify

for a California teaching credential from UCSD through the Teacher Education Program. The department offers a full range of courses in cultural, social, and psychological anthropology, with special attention to personality, cognition, religion, identity, politics, and the family. The department also offers courses in archaeology and biological anthropology. Courses include offerings which focus on specific societies or regions of the world as well as more topically oriented materials. The department offers undergraduate minor and major programs, a senior thesis program, an undergraduate internship program, and a graduate program leading to the doctoral degree.

## THE UNDERGRADUATE PROGRAM

### LOWER DIVISION

Lower-division offerings in anthropology are concentrated mainly in two series of courses, ANLD 10, 11, 12 and ANLD 22, 23, and 24. Collectively, any three of the courses offered in the same year in the same series are designed to provide a comprehensive orientation to the ideas and methods of anthropological investigation and a familiarity with case materials from a number of different societies. The colleges differ in which combinations constitute a "sequence" for purposes of filling college requirements. Consult your provost's office for the rules that currently apply to your college. Students who anticipate majoring in anthropology are particularly advised to take ANLD 22, which is the prerequisite for most upper-division cultural and psychological courses offered by the department.

Students who intend to major or minor in biological anthropology should take ANLD 10, which is prerequisite to all upper-division biological anthropology courses.

Students who have already completed ANPR 105, 106, and 107 may not receive academic credit for ANLD 22.

Other lower-division courses are offered from time to time and will vary from year to year.

### THE MINOR

Students may choose a minor in either general anthropology or biological anthropology. Each consists of six anthropology courses. At least three courses must be upper-division; at least three should be taken at UCSD. The list of courses offered for each minor is available from the department. Transfer credits from other anthropology departments are usually accepted.

Education Abroad Program credits are acceptable at the discretion of the undergraduate adviser.

### THE MAJOR

To receive a B.A. degree with a major in anthropology, the student must meet the requirements of Revelle, Muir, Third, Warren, or Fifth College, including the following requirements of the Department of Anthropology:

1. A minimum of twelve four-unit upper-division courses in the Department of Anthropology must be completed.

2. ANPR 105, 106, and 107 must be completed (included as three of the twelve courses required under No. 1, above). All or some of the courses in this sequence are prerequisites for some other upper-division courses. This sequence consists of:

- 105 Social Anthropology
- 106 Cultural Anthropology
- 107 Psychological Anthropology

3. No courses taken in fulfillment of the above requirements may be taken on a Pass/Not Pass (P/NP) basis. (An exception is made for some courses accepted from other schools and for one independent study course (199), one directed group study course (198), and a combination of one Internship Seminar (ANBI 187A,C and ANPR 187B) with the corresponding Academic Internship project (AIP 197). However, this exception does not extend to ANPR 105, 106 and 107, or to transfer credits accepted in lieu of them. These **must** be taken for a letter grade.)

4. For the B.A. degree, a minimum average of 2.0 is required, both as an overall average in all anthropology courses and in the ANPR 105-106-107 sequence considered separately.

5. At least seven of the upper-division courses submitted for the major must be taken at the University of California, San Diego. The seven normally must include ANPR 105, 106, and 107. A transfer course may be accepted in lieu of one of these "core" courses if in the opinion of the undergraduate adviser the content is substantially the same. In no case will transfer credit be accepted in lieu of more than one of these courses.

6. Majors are required to obtain a background in basic statistical techniques. Social Science 60 is recommended as one way of fulfilling this requirement.

### THE MAJOR IN ANTHROPOLOGY WITH CONCENTRATION IN BIOLOGICAL ANTHROPOLOGY

The department offers another B.A. degree, "Anthropology with Concentration in Biological

Anthropology." This degree requires the following:

1. The Core Sequence, ANPR 105, 106, 107.
2. Five four-unit anthropology courses identified as biological anthropology courses. A handout listing these courses is available from the anthropology department office.
3. Four four-unit courses in the Department of Biology. Courses which are applicable are listed in the biological anthropology handout.
4. Items 3 through 6 in the above section ("The Major in Anthropology") also apply to the major in anthropology with concentration in biological anthropology.

### (OPTIONAL) DEPARTMENTAL SENIOR THESIS PROGRAM

The senior thesis is prepared during three successive quarters of ANPR 196, Thesis Research (counted as part of the student's twelve required courses). The thesis will be evaluated by a committee consisting of the thesis adviser and one other faculty member appointed by the department chair in consultation with the thesis coordinator. The thesis adviser has sole responsibility for the grades the student receives in the three quarters. The reading committee advises the faculty on the merit of the thesis for departmental honors. Students are invited into this program by approval of the anthropology faculty. Under normal circumstances eligibility for the program requires that the student (1) complete eight upper-division anthropology courses by the end of the junior year, three of which must be the "core" sequence, and (2) achieve grade-point averages of at least 3.6 (overall) and 3.6 (anthropology) by the end of the junior year. These requirements may be waived by vote of the department faculty. Students who wish to be considered for invitation to the Senior Thesis Program should notify the department's undergraduate adviser by the second week of the spring quarter prior to advancement to senior standing.

### INTERNSHIP PROGRAM

The department sponsors an internship program that allows students to gain academic credit for supervised work in the Museum of Man, the San Diego Zoo, or the Wild Animal Park. The three tracks of the program allow internship experience in (1) physical anthropology, or (2) ethnology and archaeology at the museum, or (3) primate behavior and conservation at the zoo or Wild Animal Park. A combination of on-campus and on-site supervision makes these courses intellectually provocative but practical and applied. They are an especially valuable



complement to a major or minor in anthropology. One four-unit internship (AIP 197) taken with the corresponding two-unit internship seminar (ANBI 187A,C and ANPR 187B) can be counted as one of the twelve upper-division courses for the anthropology major or minor. Applications to these programs are accepted during the first seven weeks of the quarter before the one in which the internship is to be done.

## THE GRADUATE PROGRAM

The Department of Anthropology offers graduate training in social, cultural, and psychological anthropology. The graduate program is designed to provide the theoretical background and the methodological skills necessary for advanced research in the study of society and culture, for a career in teaching anthropology at the university level, and for the application of anthropological knowledge to contemporary problems. It is assumed that all students enter with the goal of proceeding to the doctoral degree.

Admission to the graduate program occurs in the fall quarter only, save by special waiver.

## GRADUATE ADVISING

One member of the departmental faculty functions as the graduate adviser. The role of graduate adviser is to inform students about the graduate program, approve individual registration forms, and give assistance with respect to administrative matters. After completion of the requirements for the master's degree, the chair of the student's doctoral committee serves as the student's major adviser.

Any decision to waive a requirement for either the master's degree or the Ph.D. must be made by the full faculty.

## THE MASTER OF ARTS DEGREE

Students entering the doctoral program must complete a master's degree before continuing toward the doctorate. Entering students who already have a master's degree in anthropology are not permitted by university regulations to receive a second master's degree, but they are required by the department to complete the requirements for the master's degree.

## REQUIREMENTS FOR MASTER'S DEGREE

### 1. Specific Courses:

280A-B-C: Core Seminars  
(each 4 units)

281A-B: Introductory Seminars  
(each 1 unit)

283A: Ethnographic Fieldmethods  
(4 units)

283B: Psychological Fieldmethods  
(4 units)

283C: Theoretical Foundations of Fieldwork  
(4 units)

2. By university requirement at least thirty-six quarter-units are required for the master's degree. Students must take four, letter-grade elective anthropology courses from at least three different faculty members. Required specific courses may not be counted as electives.

### 3. The Master's Thesis

In the winter quarter of the second year, a master's thesis committee is appointed. The thesis is written in the winter quarter and submitted to the committee at the beginning of the spring quarter. Completion of the specific and elective courses, unanimous approval of the master's thesis by the student's committee, and acceptance by the university archivist at the end of the spring quarter represent the final steps in the completion of all requirements for the master of arts degree.

## THE DOCTORAL DEGREE

Admission to the doctoral portion of the program is open to students who have satisfactorily completed the master's program and who have completed courses and the master's thesis at a level of excellence which indicates promise of professional achievement in anthropology.

## REQUIREMENTS FOR THE DOCTORAL DEGREE

### 1. Required Courses

In addition to the courses required in the master's program, students are required to complete three additional letter-grade elective courses.

### 2. Quantitative Methods

Students are required to demonstrate competency in quantitative methods by examination.

### 3. Foreign Language

Knowledge of one foreign language is required for a doctoral degree. A student planning fieldwork in English-speaking areas is required to pass a departmental examination in a foreign language. The language submitted for examination must receive prior approval by the student's departmental committee. The exam is administered by a member of our faculty appointed by the department chair and consists of an oral translation of part of an anthropology article into English. A student planning fieldwork in a non-English-speaking area is required to submit a written plan describing (1) the linguistic affiliations of the language(s) to be used in fieldwork,

(2) the training necessary to attain a level of proficiency adequate for fieldwork in the language(s), and (3) the student's present proficiency. If the student's proficiency is less than that needed, the plan should also describe (4) reasonably available facilities for studying the language(s), and (5) procedures which the student has followed or will follow to attain the necessary proficiency. The written plan is a requirement for Ph.D. candidacy, but proficiency itself is a requirement for the Ph.D. degree. Successful completion of a dissertation based on fieldwork using the language of the plan is accepted as evidence of successful mastery of the language.

### 4. Formation of the Doctoral Committee

Students are expected to select the chair of their doctoral committee before registration for the winter quarter of the third year. The chair of the doctoral committee serves as the student's adviser for the remainder of the student's program. In consultation with the chair of the doctoral committee, two more departmental committee members are selected, and two additional faculty members from outside the department. The final composition of the committee must be approved by the Office of Graduate Studies.

### 5. Prefield Qualifying Examination

After completion of the above requirements, the student stands for the doctoral qualifying examination, as required by the Office of Graduate Studies and Research. This examination may contain questions on any aspect of anthropology, but focuses particularly upon the merits of the student's field research proposal (see below). Successful completion of this examination marks the student's advancement to doctoral candidacy.

### 6. The Fieldwork Proposal

After admission to the doctoral portion of the program, each student prepares a dissertation research proposal to serve as the basis of the prefield oral qualifying examination. The dissertation research proposal sets forth a specific plan of research, normally involving intensive fieldwork. ANGR 296A,B provide an opportunity for the development of such a proposal. Students typically begin these courses in the fall of their third year to allow the fieldwork proposal to be developed in connection with the deadlines of external fieldwork funding agencies.

When the proposal is informally judged by committee members to be ready to be defended, the oral qualifying examination is scheduled. It is administered by the student's full doctoral committee. At least two weeks must elapse between the appointment of the doctoral committee and the qualifying examination.

A copy of the student's field research proposal must be in the hands of all doctoral committee

members ten days before the oral qualifying examination and a one-page abstract distributed to all members of the faculty. Fieldwork proposals do not normally exceed twenty double-spaced typed pages, plus abstracts.

**7. Dissertation and Dissertation Defense**

Upon completion of the dissertation research project, the student writes a dissertation which must be successfully defended in an oral examination conducted by the doctoral committee and open to the public. An abstract of the student's dissertation must be in the hands of all faculty members ten days before the dissertation hearing. A full copy of the student's dissertation must be in the hands of each of the student's doctoral committee members four weeks before the dissertation hearing. It is understood that the edition of the dissertation given to committee members will not be the final typing, and that the committee members may suggest changes in the text at the defense. This examination may not be conducted earlier than three quarters after the date of advancement to doctoral candidacy. Revisions may be indicated, requiring this examination to be taken more than once. Acceptance of the dissertation by the university librarian represents the final step in completion of all requirements for the Ph.D.

Any decision to waive a requirement for either the master's degree or the Ph.D. must be made by the full faculty.

**8. Time Limits**

Pre-candidacy status is limited to four years. Candidates for the doctorate remain eligible for university support for eight years. The doctoral dissertation must be submitted and defended within nine years. This is in accordance with university policy.

**EVALUATION**

In the spring of each year, the faculty evaluate each student's overall performance in course work and in research. A written assessment is given to the student after the evaluation. If a student's work is found to be inadequate, the faculty may determine that the student should not continue in the graduate program.

**TEACHING**

In order to acquire teaching experience, each student in the graduate program is required to participate as an assistant in the teaching activities designated by the department during one quarter in each of the student's first three years of residence. This obligation is discharged under the auspices of the course entitled "ANGR 500: Apprentice Teaching."

**COURSE REQUIREMENTS**

Only one 290-level course may be taken in any one quarter until a student attains Ph.D. candidacy.

**INTRODUCTION TO REQUIRED COURSES**

**ANGR 280A-B-C. Core Seminars in Anthropology.** This sequence of seminars constitutes the foundation of the first year of graduate study. These seminars are concerned with both contemporary and historical problems in cultural, social, and psychological anthropology. Each seminar will focus upon a series of significant debates concerning anthropological theory and data.

**ANGR 281A-B. Introductory Seminars.** These seminars are held in the first two quarters of the first year of graduate study. Faculty members will present an account of their current research and interests. When appropriate a short preliminary reading list will be given for the particular lecture.

**ANGR 283A-B-C Methods Seminars.** An opportunity to use several methods in the collection and analysis of material in social, cultural, and psychological anthropology and to discuss their strengths and problems. The first two quarters are practica. The third discusses the theoretical foundations of fieldwork.

**THE MELANESIAN STUDIES RESOURCE CENTER AND ARCHIVE**

These facilities embody the substantial interests in the Pacific Basin that are represented on the UCSD campus and the special prominence of the UCSD Department of Anthropology in the study of cultures and societies of Oceania and especially of Melanesia. In cooperation with the UCSD libraries, the Melanesian Studies Resource Center and Archive has two major projects. First, there is an ongoing effort to sustain a library collection of monographs, dissertations, government documents, and journals on Melanesia that make UCSD the premier center for such materials in the United States. Second, there is an endeavor to collect the extremely valuable unpublished literature on Melanesia, to catalog such materials systematically, to produce topical bibliographies on these holdings, and to provide microfiche copies of archival papers to interested scholars and to the academic institutions of Melanesia. This innovative archival project is intended to be a model for establishing special collections on the traditional life of tribal

peoples as dramatic social change overtakes them. In the near future, anthropological research on tribal peoples will take place largely in archives of this kind. These complementary collections will support a variety of research and teaching activities and are already attracting students of Melanesia to this campus. The Melanesian Studies Resource Center and Archive are directed by members of the Department of Anthropology faculty, in collaboration with the Central University Library.

**Courses**

NOTE: For specific course offerings, check the *Schedule of Classes* issued fall 1992, winter 1993, and spring 1993.

**ANTHROPOLOGY: LOWER DIVISION**

**ANLD 10. Human Origins: Human Evolution (4)**  
An introduction to human evolution from the perspective of physical anthropology, including evolutionary theory and the evolution of the primates, hominids, and modern man. Emphasis is placed on evidence from fossil remains and behavioral studies of living primates. (Prerequisite for upper-division biological anthropology courses.)

**ANLD 11. Human Origins: Introduction to Archaeology (4)**  
The history, goals, and methodology of archaeology will be examined. Case studies will be drawn from Near Eastern archaeology to illustrate how inferences are made about extinct cultures and how advances in theory and method can reshape our thinking. (Prerequisite for upper-division archaeology courses.)

**ANLD 12. Human Origins: Evolution of Society (4)**  
An introduction to theories of sociocultural evolution, with emphasis on the differences in human experience in the transition from hunting and gathering societies through tribal societies to the world of the modern state.

**ANLD 22. Cultural Anthropology: Introduction (4)**  
An introduction to the anthropological approach to understanding human behavior, with an examination of data from a selection of societies and cultures. (Prerequisite for most upper-division cultural and psychological anthropology courses.)

**ANLD 23. Cultural Anthropology: Society (4)**  
A cross-cultural perspective on the means by which human activities are socially organized and coordinated. Topics include legitimacy, conflict, and strategizing.

**ANLD 24. Cultural Anthropology: Symbols (4)**  
The study of how individuals use symbolic representations to understand their world, with emphasis on the way in which symbols are constructed and on their social and psychological functions.

**ANLD 42. The Study of Primates in Nature (4)**  
Major primate field studies will be studied to illustrate common features of primate behavior and behavioral diversity. Topics will include communication, female hierarchies, protocultural behavior, social learning and tool use, play, cognition and self-awareness. (Prerequisite for several upper-division biological anthropology courses.)

**ANLD 90. Undergraduate Seminar (1)**

The seminar will focus on a variety of issues and special areas in the field of anthropology. The seminar will meet a total of eight hours during the quarter.

**ANTHROPOLOGY:  
PROGRAM COURSES**

**ANPR 105. Social Anthropology (4)**

A systematic analysis of social anthropology and of the concepts and constructs required for cross-cultural and comparative study of human societies. *Prerequisite: ANLD 22 or equivalent.* (Required core course for the anthropology major.)

**ANPR 106. Cultural Anthropology (4)**

A web of problematic meanings lies behind social relationships and institutional frameworks. This perspective plays an important role in the discussion of human affairs. Course considers the concept of culture in anthropology as a particularly forceful statement of such a perspective. *Prerequisite: ANLD 22 or ANPR 105, or equivalent.* (Required core course for the anthropology major.)

**ANPR 107. Psychological Anthropology (4)**

Interrelationships of aspects of individual personality and various aspects of sociocultural systems are considered. Relations of sociocultural contexts to motives, values, cognition, personal adjustment, stress and pathology, and qualities of personal experience are emphasized. *Prerequisites: ANLD 22 or ANPR 105, and ANPR 106.* (Required core course for anthropology major.)

**ANPR 187B. Intern Seminar in Ethnography and Archaeology (2)**

Seminar complements students' research in the Academic Internship Program in ethnography and archaeology at the Museum of Man. Readings and discussions focus on problems in the analysis of material culture and classifications of artifacts and site excavations. Research paper required. *Prerequisites: ANPR 106 and simultaneous enrollment in Warren 197: Ethnography Archaeology-Museum of Man.* (P/NP grades only.) *Department approval required.*

**ANPR 196. Thesis Research (4)**

Independent preparation of a senior thesis under the supervision of a faculty member. Students begin the three-quarter sequence in fall quarter. *Prerequisites: students will be admitted by invitation of the department.* *Department approval required.*

**ANPR 197. Field Studies (4)**

Individually arranged field studies giving practical experience outside the university. *Prerequisites: consent of instructor and department approval required.* (P/NP grades only.)

**ANPR 198. Directed Group Study (2-4)**

Directed group study on a topic or in a field not included in the regular departmental curriculum by special arrangement with a faculty member. *Prerequisites: consent of instructor and upper-division standing.* (P/NP grades only.) *Department approval required.*

**ANPR 199. Independent Study (2-4)**

Independent study and research under the direction of a member of the faculty. *Prerequisites: consent of instructor.* (P/NP grades only.) *Department approval required.*

**■ ANTHROPOLOGY: BIOLOGICAL ANTHROPOLOGY**

These courses can be counted for the biological anthropology minor or concentration.

**ANBI 100. In Search of Ourselves (4)**

An approach to understanding human behavior through the investigation of the social behavior of living monkeys and apes. Historical review of primate studies with emphasis on changes in interpretation of social patterns. *Prerequisite: ANLD 10.* Taught in alternate years.

**ANBI 101. Human Social Behavior: The Evidence from Animals (4)**

An overview of theories of animal social behavior with attention to new developments in primate behavior. Evaluation of current popular books on human behavior. *Prerequisite: ANLD 10.* Taught in alternate years.

**ANBI 110. Perspectives on Human Evolution (4)**

Special seminar for students who wish to explore advanced topics in biological anthropology. Course focus will change year to year. May be repeated one time for credit. *Prerequisites: ANLD 10, one other course in biological anthropology, and consent of instructor.* *Department approval required.* Taught in alternate years.

**ANBI 132. Conservation and the Human Predicament (4)**

(Same as Biology 176.) An interdisciplinary discussion of the human predicament, the biodiversity crisis, and the importance of biological and environmental conservation in sustaining future societies. We explore the consequences of habitat destruction and special extinctions on the biosphere and human welfare. *Prerequisite: ANLD 10 or consent of instructor.* Taught in alternate years.

**ANBI 148. Primate Behavioral Ecology (4)**

The course examines various behaviors (e.g., group formation, dispersal, parenting, coalition formation) from a comparative and evolutionary perspective. Observational methodology and analytical methods will also be discussed. *Prerequisite: ANLD 42. Biology 164 recommended.* Taught in alternate years.

**ANBI 159. Biological and Cultural Perspectives on Intelligence (4)**

Attitudes toward other individuals (and species) are often shaped by their apparent "intelligence." This course discusses the significance of brain size/complexity, I.Q. tests, communication in marine mammals and apes, complex behavioral tactics, and the evolution of intelligence. *Prerequisite: any one of the following: ANLD 10, 42, Biology 3, or consent of instructor.* Taught in alternate years.

**ANBI 161. Human Evolution (4)**

Interpretation of fossil material—its morphology, variation, phylogenetic relationships, reconstruction of ecological settings and cultural patterns of early human life—demands the integration of many disciplines. Lectures cover major stages of human evolution, time ranges, distribution, archaeology, and distinctive morphology. *Prerequisite: ANLD 10 or consent of instructor.* Taught in alternate years.

**ANBI 173. The Issues of Consciousness in Animals and Humans (4)**

Using a comparative perspective, the evidence from animal behavior raises interesting questions about what consciousness is, the uniqueness of human consciousness, and the characteristics that are a part of the animal-human continuum. Course draws from various university faculty. *Prerequisite: ANLD 10 or introductory course in evolution/animal behavior or consent of instructor.*

**ANBI 175. Modeling the Behavior of our Early Ancestors (4)**

Models of human evolution combine science and myth. This course examines methods used in reconstructions of human evolution. Models such as "man the hunter" and "woman the gatherer" are examined in light of underlying assumptions, and cultural ideals. *Prerequisite: ANLD 10 or equivalent introduc-*

*tory biological anthropology course or consent of instructor.* Taught in alternate years.

**ANBI 187A. Intern Seminar in Physical Anthropology (2)**

Seminar complements students' research in the Academic Internship Program in physical anthropology at the Museum of Man. Readings and discussions focus on anatomy, pathology, and classification and x-ray analyses of skeletal remains. Research paper required. *Prerequisites: ANLD 10 and simultaneous enrollment in Warren 197: Physical Anthropology-Museum of Man.* (P/NP grades only.) *Department approval required.*

**ANBI 187C. Intern Seminar in Ethology (2)**

Seminar complements students' research in the Academic Internship Program at the San Diego Wild Animal Park and/or Zoo. Focus on problems of analysis in observational study of animal behavior and conservation in relation to ethological studies. Research paper required. *Prerequisites: ANLD 10 and one upper-division course in animal behavior, either in anthropology or biology.* To qualify, must be last-quarter junior or senior with a 3.3 GPA. *Simultaneous enrollment in Warren 197: Ethology Zoo.* (P/NP grades only.) *Department approval required.*

**■ ANTHROPOLOGY: GENERAL**

**ANGN 100. Prelude to Civilization: The Neolithic Revolution (4)**

Archaeological evidence for the origins of plant and animal domestication and for the evolution of sedentary communities will be examined. Comparisons will be drawn between early agricultural societies in the Near East and their later counterparts in the New World. *Prerequisite: upper-division standing.* *ANLD 11 recommended.*

**ANGN 101. The Emergence of Civilization: The Origins of Cities and the Rise of States (4)**

The course will focus on the variety of factors and multiple paths leading to state and urban formation in selected Near Eastern (Mesopotamia and Egypt) and New World (Maya and Inca) civilizations. *Prerequisite: upper-division standing.* *ANLD 11 recommended.*

**ANGN 108. Peasant Organization and Conflict (4)**

A study of peasant social and political movements, with emphasis on the effects of village organization and the relations between village and urban society. *Prerequisite: upper-division standing.*

**ANGN 111. Anthropology of Folklore (4)**

Review of Finnish-historical-geographical, classical functionalist, structuralist, and psychological approaches. Examined in context of analyzing specific folk narratives (myth, legend, and folktale), beliefs, proverbs, riddles, humor, and verbal duelling. Also folkloric issues surrounding ethnicity, power, gender, and world view. *Prerequisite: ANLD 22 or equivalent.*

**ANGN 114. Family, Childhood, and Society (4)**

A comparative and analytic study of the relationships between family structure and childhood experience and their effects on social and cultural systems. *Prerequisite: upper-division standing.*

**ANGN 115. Marriage and Family Life in Cultural Perspective (4)**

Sources of power, relationships, and means for spouses and family members to strive for their goals are examined emphasizing shared beliefs and values. Family relations in different societies are considered as well as the consequences for the individual, family, and society. *Prerequisite: upper-division standing or consent of instructor.*

**ANGN 118. Cognitive Anthropology (4)**

This course explores the relation between culture and cognition. Topics include cultural influences on belief systems, reasoning, perception, and motivation. The teaching style for the course is discussion and lecture, with simple classroom demonstrations. *Prerequisite: upper-division standing.*

**ANGN 124. Sex, Love, and Culture (4)**

Cultural and psychological factors in sexual behavior and sex-related roles both within and beyond the social context of the family explored. Evolutionary and cross-cultural perspective. Symbolic elaboration of sex and replacement of "arranged" with "love" relationships also examined. *Prerequisite: ANLD 22 or equivalent.*

**ANGN 128. The Anthropology of Medicine (4)**

(Same as Cont. Issues 136.) We examine the medical profession, the sick and the healers, and culture as communication in the medical event through aspects of medical practice and medical research of medicine as well as primitive and peasant systems. *Prerequisite: upper-division standing.*

**ANGN 129. Female, Male, and Gender: The Cultural Shape and Social Force of Sexual Difference (4)**

Course explores how sexual differences are culturally constructed and how such gender constructs become socially significant in various domains of community life and psychologically significant in the formation of personal identity. Both anthropological and feminist studies are examined. *Prerequisite: ANLD 22 or equivalent.*

**ANGN 133. Topics in Psychological Anthropology (4)**

Several topics will be selected for in-depth study at a graduate-equivalent level. Includes theoretical models of culture in relation to normal and abnormal behavior. *Prerequisite: ANPR 107 or consent of instructor-based on advanced standing in a related field.*

**ANGN 139. Religious Cults and Social Movements (4)**

Religious cults and social movements are studied, particularly as they enter into rapid cultural and social change. Relations between cults and movements in form and process are examined in a variety of specific cases. *Prerequisite: ANLD 22 or equivalent.*

**ANGN 140. Anthropology and History (4)**

Course explores long-standing debates concerning the character of sociocultural anthropology as historical inquiry, the nature of historiography in anthropology, and analyses of non-Western "people without history." It attends to history, myth, and time in ethnographies conceived as historical constructions. *Prerequisite: ANLD 22 or equivalent.*

**ANGN 141. Religion and Society (4)**

A comparative study of religion as a cultural system. The analysis will focus on the relationship between religion and its social and psychological determinants as well as its social and psychological functions. Materials are drawn from Western and non-Western, primitive and high religions. *Prerequisite: ANLD 22 or equivalent.*

**ANGN 143. Education and Culture (4)**

Introduction to anthropological study of education. Includes ethnography of schooling, social interaction in educational settings, language and education, ethnicity and education, psychological study of learning, culture and achievement, culture and cognition, and cross-cultural research in education. *Prerequisite: ANLD 22 or equivalent.*

**ANGN 147. Ritual and Symbolism (4)**

An examination of the place of symbols in the ritual systems of large- and small-scale societies, and a critical evaluation of theoretical models commonly applied to their analysis and interpretation. *Prerequisite: ANLD 22 or equivalent.*

**ANGN 151. Political Anthropology (4)**

An examination of the political processes at the local level, with emphasis on examination of supports for various aspects of the processes considered (e.g., leadership, factionalism, etc.). *Prerequisite: ANLD 22 or consent of instructor.*

**ANGN 153. History of Anthropology (4)**

An overview of the development of anthropology, with particular emphasis on developments centering around the concepts of "culture," "society," and "personality." *Prerequisite: ANLD 22 or equivalent.*

**ANGN 156. Kinship and Descent (4)**

This course reviews the approaches of British, French, and American anthropology to the subjects of kinship and descent, while also incorporating the relevant findings of behavioral biology and developmental psychology. *Prerequisite: ANLD 22 or equivalent.*

**ANGN 158. Psychoanalytic Anthropology (4)**

A critical examination of the anthropological works of Freud and of selected Freudian anthropologists and an assessment of their influence on anthropological theory. *Prerequisites: upper-division standing; ANLD 22 or consent of instructor.*

**ANGN 164. The Psychoanalytic Study of Folklore (4)**

This is an introductory course to the psychoanalytic study of folklore. It examines folklore materials, including myths, folktales, legends, games, humor, etc., in light of the Freudian contribution to the study of culture. *Prerequisite: ANGN 111.*

**ANGN 165. Approaching the Sacred (4)**

Course examines religion from an anthropological perspective, introducing the student first to examples of religious practice and then to theories about the origin and function of religion. Readings include Freud, Weber, Durkheim, Frazer, and James and novels by Bernanos and Lagerkvist. *Prerequisite: ANLD 22 or equivalent, or consent of instructor.*

**ANGN 168. Nature and Nurture: Race, Gender, and Culture (4)**

The course examines concepts and controversies regarding the relationship of race, gender, and other variables to intelligence, cognition, and behavior in their biological, psychological, social, and cultural contexts. *Prerequisite: upper-division standing.*

**ANGN 176. Cultural Evolution (4)**

Beginning with the relationship of biological and cultural evolution, this course will survey the history, theories, and possible application of theories concerning the evolution of culture, examining the state of present world culture and its future in this context. *Prerequisite: upper-division standing or consent of instructor.*

**ANGN 180. The Culture of Children (4)**

This course explores the interrelationships of cultural, psychological, and social aspects of socialization and enculturation with respect to contemporary views of child development in psychological anthropology. Emphasis is given to examining the cultural world of children's experience. *Prerequisite: ANLD 22 or equivalent.*

**ANGN 191. Seminar in Medical Anthropology (4)**

(Same as Contemporary Issues 181.) Advanced medical seminar examines theory and method in the analysis of studies and research projects through surveying the literature and clinical situations (medical anthropology writings, medical grand rounds, epidemiology). *Prerequisite: upper-division standing. Department approval required.*

**ANGN 193. Witchcraft, Shamanism, and Psychiatry (4)**

Witchcraft accusation and practice in premodern and modern societies, shamanic practice, and psychiatry discussed. Underlying question is, how does therapy work, and what are the underlying commonalities of these three different therapeutic and explanatory discourses? *Prerequisite: upper-division standing.*

■ **ANTHROPOLOGY: REGIONAL**

**ANRG 102. Latin American Societies and Culture (4)**

Anthropological overview of Latin American cultural ecology, history, ethnicity, economic and social organization, personality, gender, ethos and world view, symbolism, migration, the culture of terror, and current developments in the anthropology of the region. *Prerequisite: ANLD 22 or equivalent, or consent of instructor.*

**ANRG 104. Traditional African Societies and Cultures (4)**

Attention to three main sociopolitical types of societies: egalitarian hunting and gathering groups, loosely organized agricultural and herding groups, and centrally organized kingdoms. Representatives are considered, and societies from all parts of sub-Saharan Africa studied intensively. *Prerequisite: upper-division standing.*

**ANRG 117. Gender across Cultures (4)**

This course explores the construction of gender, as a principle of social and symbolic differentiation, cross-culturally. Using case studies from Asia, Africa, the Middle East, Oceania and the Americas, we examine relationships among gender, kinship, economics, religion, and politics. *Prerequisite: ANLD 22 or consent of instructor.*

**ANRG 120. American Values (4)**

This course examines the current social science theories and data concerning American values, including ethnographic and survey materials. Students will be expected to critique current work and to undertake research on special topics involving American values. *Prerequisite: upper-division standing.*

**ANRG 125. Contemporary Central America (4)**

Focus on anthropological contributions to the understanding of contemporary Central America—considers ecological influences, historical continuities and change, economic systems, personality, ethos, ethnicity, migration, the three R's (religion, reform, and revolution), culture of terror, and current developments in Central American anthropology. *Prerequisite: ANLD 22 or consent of instructor.*

**ANRG 133. Politics and Modernity: Urban Cultures in Latin America (4)**

Course explores four interrelated themes of urban culture in Brazil, Argentina, and Chile: social inequalities, violence and everyday life, political culture and citizenship, and new social movements in relation to democracy and legal pluralism. Comparative, historical, and anthropological readings emphasized. *Prerequisite: upper-division standing. ANLD 22 or equivalent.*

**ANRG 134. The Cultures of Mexico (4)**

(Same as Cult. Trad. 134.) Various aspects of the multiple cultures of Mexico from the anthropological perspective will include field studies by anthropologists, focusing on changing emphases in investigative style and analyses, peasant communities, *ejidos*, studies of elites, indigenous "Indian" cultures, and culture change. *Prerequisite: upper-division standing or consent of instructor.*

**ANRG 135. Indian Society (4)**

A study of the social structure of India, with particular reference to caste and political organization. *Prerequisite: upper-division standing.*

**ANRG 137. Societies and Cultures of Melanesia (4)**

Consideration of the history and development of Melanesia and of selected societies within that area of the Pacific, with particular reference to the cultures and social structures which have developed there. *Prerequisite: ANLD 22 or equivalent.*

**ANRG 145. Topics in Latin American Societies and Cultures (4)**

Review of current social science research in Latin American studies. Themes will vary from year to year: class, gender, ethnicity, religion, etc. *Prerequisite: upper-division standing.*



**ANRG 152. Gandhi: The Man and His Society (4)**

This course uses Gandhi as a focus in exploring Indian culture, British colonialism, and moral commitment. Students will read Gandhi's writings and the work that deeply influenced Gandhi—Tolstoy, Ruskin, Thoreau, the *Bhagavad Gita*—in the effort to answer the question: what was Gandhi's "truth"? *Prerequisite: upper-division standing.*

**ANRG 162. Peoples of the Near East (4)**

An introduction to the social and political traditions of the tribal and peasant peoples of the Near East. Some attention will be devoted to an interpretation of the oral literature of these peoples as a means for understanding these traditions. *Prerequisite: ANLD 22 or equivalent.*

**ANRG 166. Family and Society in the Near East (4)**

An introduction to the historical and sociological study of societies with Islamic traditions and a discussion of the social and political problems associated with such societies. *Prerequisite: ANLD 22 or equivalent.*

**ANRG 170. Traditional Chinese Society (4)**

Course examines major institutions and culture patterns of traditional China, especially as studied through ethnographic sources. Topics include familism, religion, agriculture, social mobility, and personality. (This introductory course is a prerequisite to other upper-division anthropology courses on China.) *Prerequisite: upper-division standing, or consent of instructor. (Formerly AN 144.)*

**ANRG 171. Chinese Familism (4)**

This course explores the ethnography of family life in traditional China and the theoretical issues raised by Chinese familism for our understanding of family life in general and for other aspects of Chinese culture. *Prerequisite: ANRG 170 (formerly AN 144) or consent of instructor. (Formerly AN 109.)*

**ANRG 172. Culture and Personality in China (4)**

Chinese personality formation and value orientations as seen in recent studies of personality and culture of Chinese population. Stress is on noncommunist Chinese. *Prerequisite: ANRG 170 (formerly AN 144) or consent of instructor. (Formerly AN 136.)*

**ANRG 173. Chinese Popular Religion (4)**

The religious world of ordinary Chinese of precommunist times, with some reference to major Chinese religious traditions. Particular emphasis on the relation between popular religion and other aspects of Chinese personality or culture. *Prerequisite: ANRG 170 (formerly AN 144) or consent of instructor. (Formerly AN 103.)*

**ANRG 182. Ethnography of Island Southeast Asia (4)**

This is an introduction to the diverse cultures of island and peninsular Southeast Asia, including those of Indonesia, the Philippines, and Malaysia. We look at ritual, economic life, gender, popular culture, and social change in tribal, agrarian, and urban societies. *Prerequisite: ANLD 22 or equivalent.*

**ANRG 189. Zionism (4)**

This seminar examines the ideological and social bases of the Zionist idea and the role of the Zionist movement in the Jewish settlement of Palestine, the formation of the state of Israel, and Arab-Jewish relations. *Prerequisite: upper-division standing.*

**■ ANTHROPOLOGY: GRADUATE**

**ANRG 200. The Evolution of Mind in Culture (4)**

Course provides a current synthesis of the line of thought that places the human mind or intellect, and more broadly, human personality, in the constitutive context of cultural evolution. Reference is made to current cognitive and cultural evolutionary theory. *Prerequisite: graduate standing or consent of instructor.*

**ANRG 202. Cultural Belief Systems: Rationality and Relativism (4)**

This course explores selected problems in anthropology, cognitive psychology, and philosophy that converge in analytic assessments of the "logic" of cultural belief systems as theoretical constructions. *Prerequisite: graduate standing in anthropology.*

**ANRG 210. Social Conflict and Democracy in Brazil (4)**

This course examines the processes and dilemmas of democratization in urban Brazil. It develops a cross-class analysis of four historically related issues, focusing on both social practice and political institutions: social inequality, violence, legal pluralism, and new social movements. *Prerequisite: graduate standing or consent of instructor.*

**ANRG 217. Current Theoretical Issues in Anthropology (4)**

Discussion and evaluation of theoretical and methodological issues based on selected papers in the current anthropological and related literature. *Prerequisite: completion of first-year graduate program in anthropology.*

**ANRG 218. Cognitive Anthropology (4)**

This course will consider the relation between cultural behavior and cognitive processes. Selected topics from the fields of ethnoscience, semantic and grammatical analysis, decision making, and belief systems will be discussed. *Prerequisite: graduate standing in anthropology or psychology.*

**ANRG 222A-B-C. Anthropology in Melanesia (4-4-4)**

Explores selected aspects of Melanesian ethnography with special attention to the interrelationship of theory, ethnographic region, and single-society studies. Individual research required. *Prerequisite: completion of first year of graduate study in anthropology or consent of coordinator. (S/U grades only.)*

**ANRG 225. Rhetorical Tradition and Social Experience (4)**

The course reviews ethnographies of rhetorical traditions which explore the connection of rhetoric with social institutions and experiences. *Prerequisite: graduate standing.*

**ANRG 229. Projective Techniques in Cross-Cultural Perspective: The T.A.T. in Fieldwork Studies (4)**

A graduate-level introduction to the use of the Thematic Apperception Test in cross-cultural perspective. The course will cover methodological and theoretical issues in the use of projectives in the field. *Prerequisite: graduate standing.*

**ANRG 230A. Department Colloquium (1)**

Forum for presentation of papers by students, faculty, and guests. Course will be offered quarterly. *Prerequisite: graduate standing in anthropology at pre-M.A. level. (S/U grades only.)*

**ANRG 230B. Department Colloquium (1)**

Forum for presentation of papers by students, faculty, and guests. Course will be offered quarterly. *Prerequisite: graduate standing in anthropology at pre-fieldwork level (Ph.D. candidacy). (S/U grades only.)*

**ANRG 230C. Department Colloquium (1)**

Forum for presentation of papers by students, faculty, and guests. Course will be offered quarterly. *Prerequisite: graduate standing in anthropology at post-fieldwork level (dissertation write-up level). (S/U grades only.)*

**ANRG 234. Dynamics of Culture (4)**

Examination of the actual operation of culture with attention to the importance of cultural products and social structure. Course goal is to develop skill in understanding the influence, direct and indirect, of culture on behavior. *Prerequisite: graduate standing.*

**ANRG 240. Morality and the Moral Order (4)**

This course will examine anthropological, psychological, philosophical, and theological texts as the means to interpret

the use of moral concepts within the ethnographic context. Authors and issues considered will include Durkheim, Weber, Freud, suffering, theodicy, and gender differences. *Prerequisite: graduate student in anthropology or consent of instructor.*

**ANRG 244. Culture and Psychopathology (4)**

The possible role of culture in forms of psychopathology described for other cultures as well as our own will be set against trends in bioneurological research of recent decades. Lines of theory and research bridging the two will be explored. *Prerequisite: course in psychological anthropology, such as ANPR 107 or ANGR 280C, or consent of instructor.*

**ANRG 246. Humans in Evolutionary Perspective (4)**

Human behavior and culture are the result of 60 million years of primate evolutionary history. This seminar will examine the important events in that history, with an emphasis on evolutionary processes and adaptive aspects of behavior. *Prerequisite: graduate standing in anthropology.*

**ANRG 253. History of Anthropology (4)**

A synoptic treatment of the intellectual currents affecting anthropology during its premodern period, between approximately 1880 and 1940. Coverage will include developments in American, British, and Continental traditions of the discipline. *Prerequisite: graduate standing.*

**ANRG 254. Postmodern Anthropology: A Critical Appraisal (4)**

Seminar addresses the philosophical issues roused by recent trends in anthropological writing. Main foci will be to identify the elements of "postmodern" anthropology and to examine critically their implications for empirical methodology, ethnographic objectivity, and cross-cultural analysis. *Prerequisite: graduate standing in anthropology.*

**ANRG 256. Psychological Methods in Field Research (4)**

Research dealing with the relation of cultures and psychology requires measures or methods of appraisal of psychological variables. We will survey ways in which such variables have been or might be implemented, anticipating needs and means of data analysis. *Prerequisite: second-year anthropology students.*

**ANRG 258. Selected Topics in Psychoanalytic Theory (4)**

A critical analysis of the psychoanalytic approach to selected topics in anthropology, such as religion, totemism, gender, social character, and symbolism. The topic for each seminar will be posted in advance. *Prerequisite: graduate standing.*

**ANRG 261. Bibliographic Resources in Anthropology (0-1)**

This course will acquaint students with a wide range of bibliographic sources useful in anthropological research. *Prerequisite: open to graduate students in anthropology and selected undergraduates. (S/U and P/NP grades only.)*

**ANRG 270A-B-C. Psychiatry and Anthropology (0-4)**

Introduction to interviewing and diagnostic techniques in psychiatry and their application to anthropological research. Content will vary from quarter to quarter. Students must begin the program in the fall quarter. *Prerequisites: graduate standing in anthropology and consent of instructor.*

**ANRG 275. Latin American Societies and Cultures: Reading the Classical Ethnographies (4)**

A graduate-level introduction to the key ethnographies of Latin America. *Prerequisite: graduate standing.*

**ANRG 276. Anthropology and Language (4)**

This course is designed to provide graduate students in anthropology (1) with an overview of linguistic concepts of possible relevance to ethnographic fieldwork, and (2) with an introduction to conceptions of language that have informed the development of anthropological theory.



**ANGR 280A-B-C. Core Seminar in Anthropology (4-4-4)**

The core seminar is taken by all first-year graduate students. The first quarter focuses on individual action and social institutions; the second on personal consciousness and cultural experiences; and the third on motives, values, cognition, and qualities of personal experience. *Prerequisite: first-year graduate student in anthropology.*

**ANGR 281A-B. Introductory Seminar (4)**

These seminars are held in the first two quarters of the first year of graduate study. Faculty members will present an account of their current research and interests. When appropriate a short preliminary reading list will be given for the particular lecture. *Prerequisite: first-year graduate standing in anthropology.*

**ANGR 283A. Ethnographic Field Methods (4)**

A practicum on ethnographic data collection. This course will require students to develop and organize a data base of original ethnographic observations. *Prerequisite: first-year graduate student in anthropology. Offered in the winter quarter of the first year.*

**ANGR 283B. Psychological Field Methods (4)**

An introduction to a wide range of techniques including interview, observation, and testing leading to psychological inferences about groups and individuals in cross-cultural context. *Prerequisite: ANGR 283A. Offered in the fall quarter of the second year.*

**ANGR 283C. Theoretical Foundations of Fieldwork (4)**

This course will examine the theoretical and philosophical foundations of field research, including classic and current debates and positions. *Prerequisite: ANGR 283B. Offered in the spring quarter of the second year.*

**ANGR 294. Informant Work (1-4)**

When available, students will receive training, practice, and experience in working with a member of another culture. Students will elicit and analyze linguistic and cultural information in anticipation of field research in other cultures. *Prerequisite: graduate standing or consent of instructor. (S/U grades only.)*

**ANGR 295. Master's Thesis Preparation (1-12)**

The student will work on the master's thesis under the direction of the departmental committee chair. The course will normally be taken in the winter of the student's second year. *Prerequisites: graduate student in anthropology and permission of master's thesis chair. (S/U grades only.)*

**ANGR 296A. Fieldwork Proposal Preparation (4)**

The student will work in cooperation with his or her departmental committee to develop a research proposal for the doctoral research project. *Prerequisites: graduate standing in anthropology and permission of departmental committee chair. (S/U grades only.)*

**ANGR 296B. Fieldwork Proposal Preparation (4)**

The student will work in cooperation with his or her departmental committee to develop a research proposal for the doctoral research project. *Prerequisites: advanced graduate standing in anthropology and permission of departmental committee chair. (S/U grades only.)*

**ANGR 297. Research Practicum (1-4)**

Supervised advanced research studies with individual topics to be selected according to the student's special interests. *Prerequisite: for anthropology graduate students who have returned from their field research. (S/U grades permitted.)*

**ANGR 298. Independent Study (1-4)**

Supervised study of individually selected anthropological topics under the direction of a member of the faculty. *Prerequisite: graduate standing. (S/U grades only.)*

**ANGR 299. Dissertation Research (1-12)**

*Prerequisite: Ph.D. candidacy in anthropology. (S/U grades only.)*

**ANGR 500. Apprentice Teaching (1-4)**

Anthropology graduate students participate in the undergraduate teaching program for one quarter per year for the first three years. Equivalent to duties expected of a 50 percent teaching assistant. Enrollment for four units documents the Ph.D. requirement. *Prerequisite: graduate standing in anthropology.*

**APPLIED MECHANICS AND ENGINEERING SCIENCES (AMES)**

See Engineering, Division of.

**APPLIED OCEAN SCIENCE**

OFFICE: 22 Old Scripps Bldg., Scripps Institution of Oceanography

**ASSOCIATED FACULTY**

**Professors**

Michael J. Buckingham, Ph.D., *SIO; MPL*  
 LeRoy M. Dorman, Ph.D., *SIO; GRD*  
 Carl H. Gibson, Ph.D., *AMES; SIO*  
 Robert T. Guza, Ph.D., *SIO; CCS*  
 William S. Hodgkiss, Ph.D., *SIO; MPL*  
 Robert Pinkel, Ph.D., *SIO; MPL*  
 Richard C.J. Somerville, Ph.D., *Meteorology*  
 Charles W. Van Atta, Ph.D., *AMES; SIO*  
 Clinton D. Winant, Ph.D., *SIO; CCS*

**Professors Emeritus**

Victor C. Anderson, Ph.D., *ECE; MPL*  
 Hugh Bradner, Ph.D., *AMES; IGPP*  
 Douglas L. Inman, Ph.D., *SIO; CCS/MAP*  
 George G. Shor, Jr., Ph.D., *SIO; MPL*  
 Fred N. Spiess, Ph.D., *SIO; MPL*  
 Kenneth M. Watson, Ph.D., *SIO; MPL*

**Associate Professor**

John A. Hildebrand, Ph.D., *SIO; GRD; MPL*

**Assistant Professor**

James M. Ricles, Ph.D., *AMES*

**Lecturers**

Fred H. Fisher, Ph.D., *ECE; MPL*  
 Scott A. Jenkins, Ph.D., *SIO; CCS*  
 Dick Seymour, Ph.D., *SIO; FOR*

**Associated Research Staff**

Jules S. Jaffe, Ph.D., *SIO; MPL*  
 Christian P. de Moustier, Ph.D., *SIO; MPL*  
 Toyooki Nogami, Ph.D., *SIO; MRD*  
 Spahr C. Webb, Ph.D., *SIO; MPL*

**Associated Research Groups**

Marine Physical Laboratory, *MPL*  
 Institute of Geophysics and Planetary Physics, *IGPP*  
 Center for Coastal Studies, *CCS*  
 Marine Archaeological Program, *MAP*  
 Marine Research Division, *MRD*  
 Foundation for Ocean Research, *FOR*  
 Southwest Fisheries Center/NOAA, *SFC*  
 Geological Research Division, *GRD*

**THE GRADUATE PROGRAM**

Applied Ocean Science (AOS) is an interdepartmental Ph.D. program concerned with humans' purposeful and useful intervention in the sea. It is administered by an interdepartmental group composed of members of the faculties of cooperating departments: the Graduate Department of the Scripps Institution of Oceanography (SIO), the Department of Applied Mechanics and Engineering Sciences (AMES), and the Department of Electrical and Computer Engineering (ECE).

This interdepartmental curriculum combines the resources of these departments to produce oceanographers who are knowledgeable about modern engineering and instrumentation, as well as marine oriented engineering scientists who are familiar with the oceans. Since physical, chemical, geological, and biological aspects of the oceans and all forms of engineering may be involved, the curriculum provides maximum flexibility in meeting the needs of each individual student.

Candidates for admission should apply directly to one of the departments participating in the Applied Ocean Science program, listing Applied Ocean Science as an area of specialization. The choice of department should be based on the individual student's planned area of major emphasis. The necessary undergraduate preparation for admission will be that required by the department to which the student applies.

The program is primarily directed toward the Ph.D. degree. However, both the candidate of philosophy and master of science degree (either Plan I, thesis, or Plan II, comprehensive examination) also will be offered under special circumstances. Students applying for a terminal master's program should be aware of any special requirements for the department to which they apply.

The degrees completed under this program in the Department of SIO will carry the title "Oceanography." Those degrees completed in the other cooperating departments will have the parenthetical title "(Applied Ocean Science)" appended to the appropriate authorized title.

**Courses**

All students enrolled in the program are required to take or demonstrate proficiency in the following core courses or their equivalent:

**SIO 210A (Physical Oceanography)**

**SIO 240 (Marine Geology)**

**SIO 260 (Marine Chemistry)**

**SIO 280 (Biological Oceanography)**

**AMES 294A-B-C (Methods in Applied Mechanics) or**

**Math. 210A-B-C (Mathematical Methods in Physics and Engineering)**

The students are expected to enroll in the Applied Ocean Science Seminar (SIO 208) throughout their period of residency. This seminar will make use of outside speakers, faculty members, and students in presenting various topics on applied ocean science and related fields. It provides a central forum in which all AOS students can participate. In addition to these basic requirements, the student will be subject to whatever additional requirements are prescribed by his or her department.

Since the first year's course work is almost entirely devoted to the AOS core courses, that time provides an excellent opportunity for students to investigate the research programs of the various research groups on the campus, and cultivate association with professors and research groups which can provide support and guidance for thesis research in their selected field of specialization. In consultation with an adviser, students will plan a curricular path of courses which will adequately prepare them in their field of specialization. The courses may be selected from the entire catalog of courses available on the UCSD campus or where appropriate from other UC campuses and other universities.

**ARCHITECTURE,  
SCHOOL OF**

ADMINISTRATIVE OFFICE: Building 409,  
Matthews Academic and Administrative Complex

**FACULTY**

Founding faculty for the School of Architecture are listed below. Information about new faculty is available at the school's administrative office.

**Professors**

William Curtis, Ph.D.

Craig Hodgetts, M.Arch.

Adèle Naudé Santos, M.Arch., *Dean*

**Associate Professors**

Dana Cuff, Ph.D.

Susan Ubbelohde, M.Arch.

**GENERAL**

In 1988 the Board of Regents of the University of California established the School of Architecture at the San Diego campus. Adèle Naudé Santos, noted architect and educator, was appointed founding dean and her goal is to create a school and curriculum that will become a new model for architectural education. The school is intended to be experimental. Its search for the best teaching and learning format will be an evolving process in which the students will be fully engaged. Classes will be small, with a rich ratio of faculty to students.

The School of Architecture at UCSD is research based and inquiry in the fullest sense is at the center, not the periphery, of the school's activities. Having the research component at the very center of the school provides a unique impetus to the curriculum that is not found in other architecture schools. The ongoing research, and the students' participation in it, will provide continual examination of the curriculum and help to keep it focussed on current and emerging issues.

The school's teaching programs will include broad preprofessional undergraduate education and professional training at the master's level. The school will begin by admitting students to the master's program in the fall of 1992, and the other programs will be introduced later.

**THE UNDERGRADUATE PROGRAM**

The School of Architecture will offer an array of courses to provide an introduction to the field of architecture, to satisfy general-education requirements, and to complete a program leading to a bachelor of arts degree in architecture.

The B.A. degree program will be open to students in all UCSD undergraduate colleges. The major will be appropriate for undergraduates interested in a challenging program that uses art, engineering, history, and social science in the study of the design of our physical environment. It will constitute excellent preprofessional training for students interested in careers in architecture, urban planning, and related fields. Because the program will lead to a nonprofessional, unaccredited degree, it will emphasize the artistic, humanistic, and scientific foundations of the field. At the same time, it will provide sufficient grounding in the technical aspects of the field to enable a student to enter a professional graduate program.

At this stage (winter 1992), the architecture faculty are developing general courses and the specific program for the bachelor's degree. Please contact the school for current information about the undergraduate program.

**THE GRADUATE PROGRAM**

The UCSD School of Architecture intends to offer three master's programs: master of architecture I, master of architecture II, and master of science. As indicated above, the school is research based and this will be apparent in the curriculum and the ongoing research into the design of new prototypes and processes at multiple scales. Problem sets explored in the studio will not be simply exercises, but part of larger research endeavors where critical issues of our era will be explored in depth.

When existing schools of architecture are examined, it is clear that there is no school quite like the one being developed at UCSD: a graduate professional school of architectural studies with a strong research base, focussing on global issues, combining theory and practice. The UCSD campus provides the opportunity for innovative development in professional training without the weight of traditional modes designed for other purposes and conceptions.

Preparation of this catalog copy is occurring simultaneously with the process of administrative review and approval of the master's programs. The program descriptions below may be useful to prospective students generally exploring architecture schools, but current and complete information should be sought from the School of Architecture for full consideration of the programs.

**MASTER OF ARCHITECTURE I**

The M.Arch. I is a first professional degree program, for students already holding a B.A. or B.S. degree. Although the program has some unique philosophical and structural features, it includes course work in the traditional categories of architectural training. The program of study requires ten quarters of course work in residence plus one summer design-build practicum. Students will progress through studios, lectures, and seminars dealing with increasingly complex issues. The first five quarters are highly structured, with the five-quarter sequence, Architectural Design: Theories and Principles, a uniquely integrated studio/seminar course, at the core. Beginning in the sixth quarter, students participate in research projects, electives, and more traditional design studios. The master of architecture I degree will be awarded upon successful

## BIOLOGY

completion of the studio and course work, including a final research project in design.

### MASTER OF ARCHITECTURE II

The M.Arch. II is a second professional degree program aimed at students already holding a professional degree in architecture. The purpose of the course of study will be to extend the students' knowledge beyond the traditional boundaries of architecture. The course content will be research oriented, and studios will focus on topics related to the ongoing research agendas in the school. Four quarters of study is required for the M.Arch. II degree. The Design Studio constitutes half of the required units and one of the studios will be involved directly with the school's research center. In the fourth quarter a research paper on a topic of choice dealing with urban futures will be required as the culmination of the course of study.

### MASTER OF SCIENCE IN ARCHITECTURE

The master of science in architecture program is a non-studio-based degree intended for students already holding a professional degree in architecture who wish to advance their understanding of or expertise in some particular aspect of the field. The program of study for the M.S. requires three quarters of course work in which students will choose an area of specialization and work with a faculty adviser to shape a program of seminars and lecture courses. A thesis resulting from independent research on a topic of choice within the area of specialization is required for graduation.

## BIOCHEMISTRY

There is no department of biochemistry at UCSD. There is an undergraduate major in biochemistry and cell biology offered by the Department of Biology and an undergraduate major in chemistry/biochemistry offered by the Department of Chemistry; these majors are described in the biology and chemistry sections of this catalog.

Both the Department of Biology and the Department of Chemistry offer graduate programs with specialization in biochemistry. Those programs are described in the biology and chemistry sections of this catalog.

## BIOLOGY

STUDENT AFFAIRS OFFICE  
2322 Humanities and Social Sciences Building  
(619) 534-2786 (undergraduate)  
(619) 534-3835 (graduate)

FINANCIAL AND ADMINISTRATIVE OFFICES  
2130 Bonner Hall, Revelle College

### Professors

Darwin K. Berg, Ph.D.  
Jack W. Bradbury, Ph.D.  
Stuart Brody, Ph.D.  
Ted J. Case, Ph.D., *Chair*  
Maarten J. Chrispeels, Ph.D.  
Russell F. Doolittle, Ph.D.  
Richard W. Dutton, Ph.D.  
Richard A. Firtel, Ph.D.  
Morris E. Friedkin, Ph.D., *Emeritus*  
E. Peter Geiduschek, Ph.D.  
Michael E. Gilpin, Ph.D.  
Melvin H. Green, Ph.D.  
Clifford Grobstein, Ph.D., *Emeritus*  
William A. Harris, Ph.D.  
Masaki Hayashi, Ph.D.  
Donald R. Helinski, Ph.D.  
John J. Holland, Ph.D.  
William B. Kristan, Jr., Ph.D.  
Michael Levine, Ph.D.  
Dan L. Lindsley, Ph.D., *Emeritus*  
William F. Loomis, Jr., Ph.D.  
William D. McElroy, Ph.D., *Emeritus*  
Stanley E. Mills, Ph.D., *Emeritus*  
Maurice Montal, Ph.D.  
Xuong Nguyen-Huu, Ph.D.  
Paul A. Price, Ph.D.  
Milton H. Saier, Ph.D.  
Paul D. Saltman, Ph.D.  
Immo Scheffler, Ph.D.  
Terrence J. Sejnowski, Ph.D.  
Allen I. Selverston, Ph.D.  
S. Jonathan Singer, Ph.D.  
Douglas W. Smith, Ph.D.  
Deborah H. Spector, Ph.D.  
Nicholas C. Spitzer, Ph.D.  
Herbert Stern, Ph.D., *Emeritus*  
Susan L. Swain, Ph.D., *in-residence*  
Suresh Subramani, Ph.D.  
Kiyoteru Tokuyasu, Ph.D., *Emeritus*  
Silvio S. Varon, M.D.  
Sandra L. Vehrencamp, Ph.D.  
Christopher J. Wills, Ph.D.  
David S. Woodruff, Ph.D.  
Juan Yguerabide, Ph.D.

### Associate Professors

Willie C. Brown, Ph.D.  
Douglass J. Forbes, Ph.D.  
P.A.G. Fortes, M.D., Ph.D.

Stephen M. Hedrick, Ph.D.  
Muriel N. Nesbitt, Ph.D.  
John W. Newport, Ph.D.  
Ramon Piñon, Ph.D.  
Percy J. Russell, Ph.D., *Emeritus*  
Jean Y. J. Wang, Ph.D.  
Charles G. Zuker, Ph.D.

### Assistant Professors

Ethan Bier, Ph.D.  
Nigel M. Crawford, Ph.D.  
Christine E. Holt, Ph.D., *in-residence*  
James T. Kadonaga, Ph.D.  
Joshua R. Kohn, Ph.D.  
Vivek Malhotra, Ph.D.  
Cornelis Murre, Ph.D.  
James W. Posakony, Ph.D.  
Trevor D. Price, Ph.D.  
Robert J. Schmidt, Ph.D.  
Julian I. Schroeder, Ph.D.  
Michael P. Yaffe, Ph.D.  
Martin F. Yanofsky, Ph.D.

### Adjunct Professors

Suzanne Bourgeois, Ph.D.  
Melvin Cohn, Ph.D.  
Walter Eckhart, Ph.D.  
Ronald M. Evans, Ph.D.  
Daniel Goodman, Ph.D.  
Meredith Gould, Ph.D.  
Martin Haas, Ph.D.  
Yasuo Hotta, Ph.D., *Research Biologist—Emeritus*  
Frank M. Huennekens, Ph.D.  
Anthony R. Hunter, Ph.D.  
Norman R. Klinman, Ph.D.  
Christopher J. Lamb, Ph.D.  
Simon LeVay, Ph.D.  
Oliver A. Ryder, Ph.D.  
Bartholomew M. Sefton, Ph.D.  
Jonathan Sprent, Ph.D.  
Inder Verma, Ph.D.  
Geoffrey M. Wahl, Ph.D.  
William O. Weigle, Ph.D.  
David J. Western, Ph.D.

## MAJOR PROGRAMS IN BIOLOGY

The UCSD Department of Biology is structured about the different levels of biological organization—biochemical, cellular, physiological, and ecological. The research and the teaching of the department emphasize the fundamentally important processes that occur at each of these levels. On such a solid foundation, future training and study in any area of biology is possible—from plant breeding to genetic counseling, from medical microbiology to ecological epidemiology, from veterinary science to cancer research. The UCSD campus is situated among some of the finest re-

search institutions in the world. The Department of Biology is fortunate in having close ties with the Scripps Institution of Oceanography, the Salk Institute of Biological Studies, and the Scripps Clinic and Research Foundation, all of which open interesting avenues for motivated students.

The department offers six different major programs, each of which provides an excellent background for future graduate or professional study. They are (1) general biology, (2) animal physiology, and neuroscience, (3) biochemistry and cell biology, (4) molecular biology, (5) microbiology, and (6) ecology, behavior, and evolution. The requirements of each of the majors are designed to meet the needs of a different group of students. These requirements are quite concordant, reflecting the department's philosophy that familiarity with certain basic aspects of the subject is fundamental to all specialized understanding. Bachelor of arts degrees granted in each of these majors will be so designated.

The Student Affairs Office, 2322 Humanities and Social Sciences Building, administers the undergraduate biology program for all five colleges and publishes the *Biology Undergraduate Handbook* each year. **For complete details regarding the policies and procedures pertaining to the biology programs, and for sample programs for each major, please refer to the *Biology Undergraduate Handbook* or contact the Biology Student Affairs Office.**

### ADMISSION TO THE MAJORS

Any student who has been accepted to the University of California, San Diego is eligible for admission to one of the six biology majors. The six biology majors are not impacted, but classroom availability may sometimes limit initial enrollment. The Department of Biology and the UCSD administration are making every effort to meet student needs for all required courses. For this reason, it is recommended that students take as many available required courses as possible when the courses are offered.

**To officially declare one of the six biology majors**, submit a completed Change of Major form, a copy of your latest UCSD transcript, and any transfer documentation pertaining to the specific major to the Department of Biology's Student Affairs Office (2322 H&SS). Refer to the *Biology Undergraduate Handbook* to determine the appropriate documentation required for transfer students.

### DEPARTMENT OF BIOLOGY RESIDENCY REQUIREMENT

To receive a bachelor of science degree in biology from UCSD, **all students must complete**

**at least nine upper-division biology courses (four-units each) in the Department of Biology while officially enrolled at UCSD.** (Students who participate in the Education Abroad Program or the Tropical Biology Program in Costa Rica may petition three departmentally approved upper-division EAP courses as substitutes toward this requirement.) Biology courses completed through the UC Extension program (concurrent enrollment) **will not** be counted toward this residency requirement.

### GRADE REQUIREMENTS FOR THE MAJORS

The minimum GPA requirement (for both the major and overall UC) for graduation is 2.0. D grades in courses required for the major are acceptable, providing that the student's major GPA and overall UC GPA is at least 2.0. Students who received D and/or F grades should contact one of the Department of Biology's undergraduate advisers to determine the effect of such grades on their GPAs. The biology major GPA calculation is based on upper-division courses required for the major and any additional upper-division UCSD Department of Biology courses taken. (Upper-division courses from other UCs, other UCSD departments, and EAP **which have been approved via petition to count toward the major** are counted into the major GPA. Other transfer courses do not count toward the UC or major GPA.) **All courses, required for any of the six majors, must be taken for a letter grade with the exception of Biology 195, 196, or 199.**

### STUDENTS WITH TRANSFER CREDIT

Courses (including prerequisites) from other institutions must be reviewed by the Department of Biology before they will be applied toward any major requirement. Upper-division transfer work (with the exception of organic chemistry) also requires a General Petition in order to be considered for satisfaction of a major requirement. Refer to the *Biology Undergraduate Handbook* or contact the Student Affairs Office (H&SS 2322) for specific information regarding transfer documentation and petition procedures.

### SUBMITTING PETITIONS TO THE DEPARTMENT OF BIOLOGY

There are many reasons you may feel the need to submit a petition. Regardless of the request, it is important that you seek the counsel of a biology undergraduate adviser so that your petition can be reviewed for appropriateness and com-

pleteness. Petitions usually take a week to ten days to process through the Department of Biology. Some requests may require additional time. After petitions are signed by the biology department chair, they are forwarded to your college's academic advising office for additional signatures. Your copy can be obtained from that office. For details concerning petitions, please refer to the *Biology Undergraduate Handbook* or contact the Student Affairs Office (H&SS 2322).

### EAP COURSES (EDUCATION ABROAD PROGRAM)

It is very important that students who plan to participate in the Education Abroad Program or the Tropical Biology Program in Costa Rica contact an adviser in the Biology Student Affairs Office in order to obtain pertinent information and referral to a faculty adviser to discuss the proposed program of study.

### SPECIAL STUDIES COURSES

Only one quarter of Biology 195 and one quarter of Biology 196 or 199 may be counted toward any biology major. For information on requirements and application procedures for special studies courses students should go to the Biology Student Affairs Office, H&SS 2322.

### Biology 195

Being a teaching assistant is an important task and can provide students with experience and faculty contact which can be valuable when applying for graduate school. Students who are interested in being a T.A. should have received a strong grade in the course which they want to teach, have an overall GPA of 3.0, and have taken at least ninety total units. Students should apply very early in the quarter prior to the quarter they wish to teach.

### Biology 199

Independent Study Biology 199 is intended to provide interested and qualified biology students with an opportunity to work closely with faculty and professionals in their chosen field and can be a valuable contribution to the student's preparation for graduate school or career goals. To enroll in Biology 199 students must have accrued at least ninety quarter-units with an overall UC GPA of at least 3.0. Students may select for their instructor any professor at UCSD, but the Biology 199 application must be submitted for department approval to the Department of Biology. The deadline to apply for Biology 199 is the eighth week of the quarter prior to the quarter the research will begin.



**AIP 197**

Because the undergraduate research conducted through the Academic Internship Program is generally done at a site not affiliated with the UCSD Department of Biology, students who wish to request that an AIP 197 course be counted toward their major must submit a General Petition for their request before the end of the eighth week of the quarter prior to when their research will begin. This early deadline allows time for the biology faculty to review and contribute to the student's research proposal and ascertain the project's appropriateness to the student's academic goals. If an AIP 197 course is approved for the student's major, no other special studies course (Biology 196 or 199) can be used toward the major.

**GENERAL BIOLOGY MAJOR**

Please refer to the "Admission to the Majors" notice detailed earlier in the Department of Biology section of this catalog.

This program allows the most diversified exposure to biology of any of the majors offered by the Department of Biology. It is designed for students with broad interests who do not wish to be constrained by the specialized requirements of the other majors and who desire maximum freedom to pursue their particular educational goals.

**LOWER-DIVISION REQUIREMENTS**

Lower-division requirements are designed to provide the foundations in mathematics, physics, and chemistry that are fundamental to the study of biology. In addition, an introduction to biology is required to provide the appropriate background for upper-division biology courses. The lower-division requirements are subsumed in large part under those of the various colleges.

Biology 1, 2, and 3 are not strictly required courses for any of the biology majors. However, it is STRONGLY RECOMMENDED that students complete at least two of these three courses in preparation for upper-division biology course work. Biology 1, 2, and/or 3 (or equivalents) are prerequisites for many required upper-division biology courses, and enrollment preference may be given to students meeting these prerequisites.

- Mathematics 1A, B, C or 2A, B, C
- Chemistry 6A, B, C, (or 7A, B) **and** one lab
- Physics 1A, B, C or 2A, B, C **and** one lab

**UPPER-DIVISION REQUIREMENTS**

Listed below are the upper-division course requirements for the general biology major. Specific requirements have been held to a minimum for this major in order to allow students maximum freedom in fitting course schedules to their particular educational goals. Because of the central positions of biochemistry and genetics in all of modern biological thought, only Biochemistry (Biology 100 or 101), its organic chemistry prerequisites (Chemistry 140A and B), and Genetics (Biology 131) are prescribed requirements for general biology majors.

1. Organic Chemistry (Chemistry 140A and 140B)
2. Either Structural Biochemistry (Biology 100) or Metabolic Biochemistry (Biology 101) is required. Both are recommended.
3. Genetics (Biology 131)
4. One four-unit upper-division biology lab to be chosen from the following: Biology 103, 112, 123, 129, 132, 138, 139, 142, 150, 157, 170, 171, 172, or 173. Independent Research (196, 199) is encouraged, but may not replace one of the formal laboratory courses listed above.
5. Nine additional four-unit upper-division courses taken through the UCSD Department of Biology are required. Only one quarter of Biology 195 and one quarter of either Biology 196 or 199 may be applied toward this requirement. (Subsequent quarters of 195, 196, or 199 may be applied toward college and university requirements.)

Although students are free to design upper-division curricula which meet their individual educational goals, Molecular Biology (Biology 106) and Cell Biology (Biology 111) are strongly recommended for those contemplating applying to graduate or professional schools.

**ANIMAL PHYSIOLOGY AND NEUROSCIENCE MAJOR**

Please refer to the "Admission to the Majors" notice detailed earlier in the Department of Biology section of this catalog.

The animal physiology and neuroscience major provides a program for studying the bodily and neural functions of complex organisms. Within this major, a student may concentrate upon more specialized areas of study, such as human biology, neurobiology, endocrinology, reproduction, marine biology, or ethology. This major is most directly applicable to health-related professions such as medicine, nursing, dentistry, veterinary medicine, pharmacy, physical therapy,

and medical technology. Animal physiology and neuroscience majors are also well prepared to enter other professions such as physiological research, physical education, agriculture, and wildlife management.

**LOWER-DIVISION REQUIREMENTS**

Biology 1, 2, and 3 are not strictly required courses for any of the biology majors. However, it is STRONGLY RECOMMENDED that students complete at least two of these three courses in preparation for upper-division biology course work. Biology 1, 2, and/or 3 are prerequisites for many required upper-division biology courses, and enrollment preference may be given to students meeting these prerequisites.

- Mathematics 1A, B, C or 2A, B, C
- Chemistry 6A, B, C, (or 7A, B) **and** one lab
- Physics 1A, B, C or 2A, B, C **and** one lab

**UPPER-DIVISION REQUIREMENTS**

Listed below are the upper-division courses required for the animal physiology and neuroscience major. The first four requirements provide exposure to the current understanding of sub-cellular function that should be at the command of all modern biologists. Requirement 5 constitutes the core of the animal physiology and neuroscience major. By choosing four optional four-unit upper-division biology courses (requirement 6), a program geared to the needs of the individual student can be formulated.

1. Organic Chemistry (Chemistry 140A, 140B, and 143A)
2. Either Structural Biochemistry (Biology 100) or Metabolic Biochemistry (Biology 101) is required. Both are recommended.
3. Molecular Biology (Biology 106)
4. Genetics (Biology 131)
5. Four from the following six courses:
  - a. Mammalian Physiology I (Biology 151)
  - b. Mammalian Physiology II (Biology 153)
  - c. Comparative Physiology (Biology 155)
  - d. Cellular Neurobiology (Biology 156)
  - e. Systems Neurobiology (Biology 158)
  - f. Developmental Neurobiology (Biology 159)
  - g. One of three Physiology Laboratories (Biology 150, Biology 123, or Biology 157). A Biology 196 or 199 may substitute for a laboratory upon approval by the faculty adviser.
6. Four additional four-unit upper-division courses taken through the UCSD Department of Biology are required and may include the above



(number 5–9). These may include no more than one quarter of Biology 195 and one quarter of either Biology 196 or Biology 199. (Subsequent quarters of 195, 196, or 199 may be applied toward college and university requirements.)

## BIOCHEMISTRY AND CELL BIOLOGY MAJOR

Please refer to the "Admission to the Majors" notice detailed earlier in the Department of Biology section of this catalog.

This major is designed to provide students with the fundamental courses required for entry into a school of medicine or into postgraduate training in a wide variety of areas of biological and biomedical sciences: biochemistry, biophysics, genetics, molecular biology, cell biology, developmental biology, microbiology, virology, human biology (physiology, metabolism, genetic disorders), cancer biology, pharmacology, and others. The emphasis is on basic principles which help us understand those processes unique to living organisms at the molecular level.

The program includes two required upper-division biology laboratory courses to provide practical experience with modern techniques and useful technology for those seeking positions as lab technicians in clinical and basic research laboratories. The opportunity to select five elective courses allows students either to seek a still broader background in a variety of biology courses or to begin specialization in a chosen field of study.

### LOWER-DIVISION REQUIREMENTS

Biology 1, 2, and 3 are not strictly required courses for any of the biology majors. However, it is STRONGLY RECOMMENDED that students complete at least two of these three courses in preparation for upper-division biology course work. Biology 1, 2, and/or 3 are prerequisites for many required upper-division biology courses, and enrollment preference may be given to students meeting these prerequisites.

Mathematics 1A, B, C or 2A, B, C  
Chemistry 6A, B, C, (or 7A, B) **and** one lab  
Physics 1A, B, C or 2A, B, C **and** one lab  
(Mathematics 2A, B, C and Physics 2A, B, C are recommended)

### UPPER-DIVISION REQUIREMENTS

1. Organic Chemistry (Chemistry 140A–B)
2. One chemistry laboratory: Organic Chemistry (Chemistry 143A) or Physical Chemistry (Chemistry 105A)

3. Structural Biochemistry (Biology 100)
4. Metabolic Biochemistry (Biology 101)
5. Biochemical Techniques (Biology 103)
6. Physical Biochemistry (Biology 104)
7. Molecular Biology (Biology 106)
8. Cell Biology (Biology 111)
9. Genetics (Biology 131)
10. One four-unit upper-division biology lab to be chosen from the following: Cell Biology (Biology 112), Embryology (Biology 123), Plant Molecular Genetics and Biotechnology (Biology 129), Eucaryotic Genetics (Biology 132), Recombinant DNA Techniques (138), Advanced Techniques in Molecular Genetics (Biology 139), Microbiology (142), Animal Physiology Lab (150), Neurobiology (Biology 157), or Organic Chemistry (Chemistry 143C). A Biology 199 research project may satisfy this upper-division lab requirement.
11. Four additional four-unit upper-division courses taken through the UCSD Department of Biology are required. Only one quarter of Biology 195 and one of Biology 196 or 199 may be applied toward the fulfillment of this requirement. Students may use only one Biology 199 for meeting major requirements. (Subsequent quarters of 195, 196, or 199 may be applied toward college and university requirements.)

## MOLECULAR BIOLOGY MAJOR

Please refer to the "Admission to the Majors" notice detailed earlier in the Department of Biology section of this catalog.

The program for molecular biology is designed to provide an intensive exposure to the theoretical concepts and experimental techniques of molecular biology. The concepts and techniques of molecular biology are the foundation for the studies of all aspects of biology in modern time. A focus on molecular biology, therefore, provides an excellent preparation for a wide range of advanced studies including basic research, medicine, bioengineering, and biotechnology. Considerable emphasis is placed on chemistry, biochemistry, and genetics for students enrolled in the program. As such, it is recommended for those students who have a particularly strong interest in this field of study.

### LOWER-DIVISION REQUIREMENTS

Biology 1, 2, and 3 are not strictly required courses for any of the biology majors. However, it is STRONGLY RECOMMENDED that students complete at least two of these three courses in preparation for upper-division biology course

work. Biology 1, 2, and/or 3 are prerequisites for many required upper-division biology courses, and enrollment preference may be given to students meeting these prerequisites.

Mathematics 2A, B, C  
Chemistry 6A, B, C (or 7A, B) **and** lab  
Physics 1A, B, C and one lab or 2A, B, C and one lab. The two sequence is recommended.

### UPPER-DIVISION REQUIREMENTS

1. Organic Chemistry (Chemistry 140A and B)
2. Organic Chemistry Laboratory (Chemistry 143A) or Physical Chemistry Laboratory (Chemistry 105A)
3. Genetics (Biology 131)
4. Structural Biochemistry (Biology 100)
5. Metabolic Biochemistry (Biology 101)
6. Molecular Biology (Biology 106)
7. Cell Biology (Biology 111)
8. Microbial Genetics (Biology 136)
9. Regulation of Gene Activity in Eukaryotic Cells (Biology 125)
10. Biochemistry Laboratory (Biology 103)
11. Laboratory in Recombinant DNA Techniques (Biology 138).
12. Four additional four-unit upper-division courses taken through the UCSD Department of Biology are required. Attention is drawn to Biology 113, Biology 116, Biology 127, Biology 128, and Biology 143. Only one quarter of Biology 199 or 196 and one of Biology 195 may be used to fulfill this requirement. (Subsequent quarters of 195, 196, or 199 may be applied toward college and university requirements.)

## MICROBIOLOGY MAJOR

Please refer to the "Admission to the Majors" notice detailed earlier in the Department of Biology section of this catalog.

The microbiology major is designed to prepare students for graduate studies and for professional careers in a variety of health-related programs. The specialization in microbiology can provide the basic background for work in medical technology, or for further training in public health or other health-related specialties. The program is also designed to provide a foundation for graduate studies in microbiology, virology, and a variety of allied fields as well as for medical and dental school.

**LOWER-DIVISION REQUIREMENTS**

Biology 1, 2, and 3 are not strictly required courses for any of the biology majors. However, it is **STRONGLY RECOMMENDED** that students complete at least two of these three courses in preparation for upper-division biology course work. Biology 1, 2, and/or 3 are prerequisites for many required upper-division biology courses, and enrollment preference may be given to students meeting these prerequisites.

Mathematics 1A, B, C or 2A, B, C  
Chemistry 6A, B, C, (or 7A, B) **and** one lab  
Physics 1A, B, C or 2A, B, C **and** one lab

**UPPER-DIVISION REQUIREMENTS**

1. Organic Chemistry (Chemistry 140A-B)
2. Organic Chemistry Laboratory (Chemistry 143A)
3. Either Structural Biochemistry (Biology 100) or Metabolic Biochemistry I (Biology 101) is required. Both are recommended.
4. Biochemical Techniques (Biology 103)
5. Molecular Biology (Biology 106)
6. Immunology (Biology 113)
7. Genetics (Biology 131)
8. Bacteriology (Biology 141)
9. Laboratory in Microbiology (Biology 142)
10. Animal Virology (Biology 143)
11. Medical Microbiology (Biology 144)
12. Three additional four-unit upper-division courses taken through the UCSD Department of Biology are required. These may include no more than one quarter of Biology 195 and one quarter of Biology 196 or 199. (Subsequent quarters of 195, 196, or 199 may be applied toward college and university requirements.) Other courses of special interest to microbiology majors are listed below:

Cell Biology (Biology 111)  
Regulation of Gene Activity in Eucaryotic Cells (Biology 125)  
Microbial Genetics (Biology 136)  
Recombinant DNA Techniques (Biology 138)

**ECOLOGY, BEHAVIOR, AND EVOLUTION MAJOR**

Please refer to the "Admission to the Majors" notice detailed earlier in the Department of Biology section of this catalog.

This major includes the fields of population biology, ecology, conservation biology, animal

behavior, population genetics, biogeography, and evolution. These fields have in common a focus on evolutionary processes and whole animals in relation to each other and to their environments. Research careers in ecology, behavior, and evolution can range from tropical community ecology studies through work on animal communication signals to the design and maintenance of ecological preserves. Applied careers for ecologists are equally varied: recent graduates now work in forestry and wildlife management, as ecological consultants for U.S. and foreign governments and private industry, or in new fields such as ecological medicine and epidemiology, environmental design and planning, and conservation biology. Because organismal biology spans such a wide variety of topics, this major has been designed to provide the basic fundamentals while allowing maximum flexibility within the general topic areas.

**LOWER-DIVISION REQUIREMENT**

Biology 1, 2, and 3 are not strictly required courses for any of the biology majors. However, it is **STRONGLY RECOMMENDED** that students complete at least two of these three courses in preparation for upper-division biology course work. Biology 1, 2, and/or 3 are prerequisites for many required upper-division biology courses, and enrollment preference may be given to students meeting these prerequisites. (NOTE: Biology 3 may be taken before Biology 1 if the student has an adequate advanced high-school biology background. It is preferred that Biology 3 be completed during the first year at UCSD.)

*Mathematics:* Three quarters of calculus are required. Mathematics 2A, 2B, and 2C are strongly recommended, but Mathematics 1A, 1B, and 1C are acceptable.

*Chemistry:* Chemistry 6A, 6B, and 6C OR Chemistry 7A and 7B. Laboratories in chemistry are not required.

*Physics:* Physics 1A, 1B, and 1C OR Physics 2A, 2B, and 2C. Laboratories in physics are not required.

**UPPER-DIVISION REQUIREMENTS**

1. Genetics (Biology 131). This course should be taken at the end of the second year.
2. Biometry (Biology 160). This course is a prerequisite for the laboratory courses in ecology and behavior and should be taken no later than the beginning of the third year.
3. Either Structural Biochemistry (Biology 100) or Metabolic Biochemistry (Biology 101) is required. Please note that organic chemistry

(Chemistry 140A and 140B) is a prerequisite for biochemistry. These prerequisite courses may be applied as elective courses under requirement number five listed below.

4. Ecology, Behavior, and Evolution. Seven four-unit courses to be chosen from Biology 161-179 are required. At least two of these courses must be laboratory or field courses (Biology 170, 171, 172, and/or 173). Courses in the 161-169 series have only Biology 3 as a prerequisite and are designed to be taken by third-year students; courses in the 170-179 series have additional prerequisites and are designed to be taken by more advanced students. Laboratory courses may be taken either concurrently with the prerequisite lecture course *if Biometry (Biology 160) has been taken*, or during the subsequent academic year. Note that some of the laboratory courses may not be offered during some years. For that reason it is recommended that students take as many required courses as possible *when the courses are offered*.

5. Four additional four-unit upper-division courses in biology, chemistry, mathematics, or related sciences are required. Courses to be completed outside of the UCSD Department of Biology **must be petitioned** (prior to commencement of the course) to satisfy this requirement. Transfer courses are considered to be outside of the department. Students participating in the Education Abroad Program should refer to the biology section of that topic or contact the undergraduate adviser. Courses outside the Department of Biology that are particularly appropriate and that have been approved in the past include: Chemistry 122, 140A-B, and 149A, Math. 111A-B-C, 180A-B-C, and 181A-B-C; Anthropology 101, 110, 113, and 161; and Earth Sciences 101. Only one quarter of Biology 196 or 199 and one quarter of Biology 195 may be used to fulfill this requirement. (Subsequent quarters of 195, 196, or 199 may be applied toward college and university requirements.) Certain intensive spring and summer session courses offered at various universities and field stations throughout the country may be used to help satisfy this requirement if prior approval is obtained from the faculty adviser of the major by petition. A good example is the field course in tropical biology offered in Costa Rica each spring quarter. Prerequisites for the Costa Rica program are: Biology 160, 162 and familiarity with Spanish; some type of field research experience, such as Biology 170-172, a field oriented Biology 199, or participation in a field research project, is strongly recommended. Consult the Education Abroad Program Office at the UCSD International Center for details.

## HONORS THESIS IN BIOLOGY

Students in any one of the six biology major programs who have a 3.7 grade-point average or above in upper-division science courses, the biology major, and overall UC at the end of their junior year are eligible to undertake the honors thesis. This program covers the senior year of undergraduate study and involves a maximum of twelve units of senior thesis research (Biology 196) taken in addition to the major requirements for graduation. (Four units of senior thesis research—Biology 196—are to be completed during each of the final three academic quarters of the student's senior year. One of these quarters of Biology 196 may be taken in the summer preceding the senior year.) Research is conducted under the supervision of a faculty member of the Department of Biology *only* and cannot be performed in the research labs of other departments such as the School of Medicine, SIO, etc. If there are any questions as to which faculty members are eligible, students should consult with the honors thesis adviser. The research will culminate in a senior thesis and an oral report (see below). Students who complete the program satisfactorily will have "Distinction in Biology" recorded on their transcript. Students who fail to make satisfactory progress will be advised to withdraw from the program and, if eligible, will receive four units per quarter of Biology 199. Students may also withdraw voluntarily from the program and, if eligible, receive appropriate credit for Biology 199. Grades for Biology 196 are P, NP, or I only.

### Application to the Honors Thesis Program

1. Students interested in the program who are eligible as of the end of the spring quarter of their junior year (the fourth quarter prior to graduation) need to find a Department of Biology faculty member willing to act in the capacity of thesis adviser and inform the Biology Student Affairs Office of their intent.
2. After an adviser is selected, the student and the adviser should complete the Department of Biology Special Studies application form (may be obtained in the biology department's Student Affairs Office, room 2322, Humanities and Social Sciences Building). The form should contain the research proposal.
3. The application form should then be submitted to the biology department's Student Affairs Office. The deadline for submitting this form is the end of the eighth week of the fourth quarter prior to graduation.

4. The application will be submitted to the honors thesis coordinator after eligibility has been determined.

5. If the student is approved for admission to the program, he or she will then be given a department stamp for enrollment in Biology 196.

Entry into the second quarter of the program will require submission to the honors thesis adviser of a written report in which the student summarizes the data obtained in the first quarter. A brief oral interview of the student on this report can also be expected. If the progress made appears reasonable for an honors student, then the 196 petition will be signed. If not, conversion of the 196 credit to Biology 199 will be recommended. Entry into the third quarter will also require a report and interview of the student. Completion of the program will require a final written report by the student at the end of the third quarter plus an oral presentation in the middle of the quarter to a group of students plus some faculty, including the honors thesis adviser.

## MINOR IN BIOLOGY

To receive a minor from the Department of Biology, a student must complete at least six four-unit biology courses, including at least three four-unit upper-division biology courses (for a total of at least twenty-four units of course work). (The student's college grade policy is enforced.) Students may apply transferable biology courses from another institution toward the lower-division requirement, after obtaining approval from both the UCSD Department of Biology *and* the student's college. No courses taken outside of the Department of Biology may be applied toward the biology minor (i.e., Chemistry 140A, Psychology 106, etc.). Advanced placement biology scores of four or five may be counted in lieu of two of the three lower-division biology courses for the department. Students with AP credit must provide the Department of Biology with a copy of the AP score at the time the minor petition is submitted.

For more information regarding a minor in biology contact the Biology Student Affairs Office.

## SECONDARY SCHOOL BIOLOGY TEACHING

UCSD's biology department is committed to the education of future biology teachers and offers an excellent preparation for teaching biology in secondary schools. If you are interested in earning a California teaching credential from UCSD, contact the Teacher Education Program for information about the prerequisite and professional preparation requirements. It is recom-

mended that you contact TEP and the Biology Student Affairs Office early in your academic career to help you plan a suitable biology curriculum. If you plan to get your credential at another institution, keep in mind that a broad education in biology is the best preparation to become a teacher.

We suggest that students take courses in plant and animal biology, microbiology, ecology, population biology, evolution, marine biology, genetics, and biochemistry. Courses in cellular and molecular biology are also advisable. After completion of Biology 1, 2 and 3, a suggested program of upper-division courses would be: Biology 101, 121, 127, 131, 155, 162, 167, SIO 275B (or Biology 24). This would give you as a prospective teacher the required breadth of education.

## INTEGRATED BACHELOR'S/ MASTER'S DEGREE PROGRAM

An integrated program leading to a bachelor of science degree and a master of science degree in biology is offered to those undergraduate students who are enrolled in any of the major programs offered by the Department of Biology at UCSD. Before the last quarter of their junior year (during the fourth quarter **prior** to the receipt of the B.S. degree)\*, students interested in obtaining the M.S. degree within one year following receipt of the B.S. degree may apply to the department for admission to the program. (Contact the Department of Biology's Student Affairs Office.) The faculty director for the program (1992-93) is Professor William Harris.

\* (In the context of this program, "senior year" refers to the final three quarters of undergraduate enrollment, and "junior year" refers to the three quarters prior to the "senior year." The minimum residency requirement for enrollment in the program is six contiguous academic quarters as an ENROLLED UCSD student prior to the receipt of the B.S. degree.)

The program is open only to UCSD undergraduates. The Department of Biology does not have financial aid available for students enrolled in this program.

## ELIGIBILITY AND ENROLLMENT

To be eligible, students must have completed the first two quarters of their junior year in residence at UCSD and must have a GPA of at least 3.0 or higher in both the major and overall UC. It is the responsibility of the prospective B.S./M.S. student to select a faculty member (from the Department of Biology) who would be willing to

serve as the student's adviser and in whose laboratory the student would complete at least twenty-four units of research over a two-year period as described below. The twelve units of research (Biology 271), which must be completed during the student's senior undergraduate year, must be taken IN ADDITION to the requirements for the bachelor's degree; these twelve units will count toward the requirements for the master's degree only and must be taken for a letter grade only. The student must confirm that the selected faculty adviser will not be on sabbatical leave during any quarter of the scheduled B.S./M.S. project. The student will also arrange (with the adviser's guidance) a schedule of courses for the senior year that will fulfill the requirements for the B.S. degree while also serving the program planned for the M.S. degree. Students are expected to meet the requirements for the M.S. degree in one year (three consecutive, contiguous, academic quarters) from the date of receipt of the B.S. degree. Any deviation from this plan, such as a break in enrollment for one or more quarters, will be cause for the student to be dropped from the program.

Application due dates are as follows:

Expected Date of Receipt of B.S.:	Application Due Date:
Fall 1993	November 13, 1992
Winter 1994	January 24, 1993
Spring 1994	August 7, 1993

Students who have been approved (by both the Department of Biology and the UCSD Office of Graduate Admissions) for the program must enroll in a Special Studies Course, Biology 271, for each, and every, quarter of participation in the B.S./M.S. program. During the eighth week of the quarter in which Biology 271 will be taken, the student needs to pick up an Add/Drop card at Biology Student Affairs Office (HSS 2322). At that time, the student's GPA will be verified and the appropriate course code assigned.

Research work (Biology 271) will be credited toward the B.S./M.S. program requirements only if it is completed during the time a student is officially enrolled at UCSD and has paid tuition for that quarter.

### REQUIREMENTS FOR THE MASTER OF SCIENCE DEGREE

1. Completion of thirty-six units of graduate course work (Biology 200-level or higher, or approved [via petition] graduate courses offered by related departments at a similar level) during the senior undergraduate year and the graduate year. The course of study must be approved by the faculty adviser and must include the following:

a. Completion of four units of research (Biology 271) during each of the final three quarters of the senior year. NOTE: It is mandatory that students complete three complete, separate, and consecutive academic quarters (with four units of research [Biol. 271] during each of the final three quarters), TO COMMENCE THE QUARTER IMMEDIATELY FOLLOWING THE QUARTER IN WHICH THE STUDENT HAS RECEIVED OFFICIAL ACCEPTANCE INTO THE PROGRAM and prior to the receipt of the B.S. degree.

b. Completion of at least four units of research (Biology 271) during each of the three quarters of the subsequent graduate year.

c. Completion of four units of teaching (Biology 500) during the graduate year

d. Completion of at least eight additional units of graduate-level course work in biology or related disciplines, approved by faculty adviser. (Biology 271 or 297 MAY NOT be used to satisfy this requirement. Biology 297 is intended for doctoral students **only** and B.S./M.S. students may not enroll in this course.)

2. Maintenance of a grade-point average (both overall and in the major) of at least 3.0 for all course work, both cumulatively and for each quarter of enrollment in the B.S./M.S. program. If the student's GPA falls below 3.0 (for either overall or in the major), he or she will be automatically dropped from the program.

3. Completion of a thesis, with an oral presentation to, and approval of, a three-member committee from the Department of Biology (the faculty adviser and two other faculty members). Students are to select the committee during the first quarter of the graduate year and are to submit the appropriate paperwork to the biology graduate coordinator, during that quarter. The student must arrange a meeting of his or her committee to discuss the proposed research during this first graduate quarter.

4. Three complete, separate, and consecutive quarters of residency as a graduate student which will commence the quarter immediately following the quarter in which the B.S. degree is awarded. (Note: The Summer Session is not considered an official quarter during the graduate year.)

5. Students who have been approved for the B.S./M.S. program must provide the Office of Graduate Admissions with a copy of their official UCSD transcripts with the B.S. degree posted, PRIOR TO THE COMMENCEMENT OF THE GRADUATE YEAR IN THE PROGRAM. Also, students are expected to contact the graduate coordinator prior to each quarter of the graduate year to verify that appropriate forms have been com-

pleted. The completed Application for Candidacy for the Thesis is to be submitted to the biology graduate coordinator during the quarter preceding the final quarter of the graduate year. Students must pay fees and be officially enrolled at UCSD during the quarter that the master's degree is to be awarded. Students must *personally* hand carry all of the necessary official graduation paperwork to the various campus offices. Friends/relatives are not allowed to do this. The thesis draft should be submitted to the Office of Graduate Studies and Research for review before the final copy is officially submitted.

### NON-DEGREE PROGRAM

The Department of Biology will accept applicants into the non-degree program for a maximum of one year only. Qualified applicants must have at least a 3.0 GPA in their upper-division work to be accepted. Justification will *not* be made for those who fall below the GPA minimum.

Students who wish to apply to the UCSD biology Ph.D. program at a later date should *not* apply for this program. However, students who have applied to graduate or medical schools elsewhere, but have not yet been accepted, are welcome to apply.

Once accepted into this program, the student has graduate status for the academic year. Courses may be taken on the undergraduate or graduate level with consent of the instructor. Students will not be assigned faculty advisers and must make their own academic plans.

### THE DOCTORAL PROGRAM

Graduate studies for a Ph.D. degree in the Department of Biology are oriented mainly toward the development of the capacity for independent research and for teaching in the biological sciences.

The requirements for entrance to graduate study in the Department of Biology are flexible, but a strong background in mathematics, chemistry, and physics is recommended.

Formal course work and opportunities for dissertation research include most basic areas of experimental biology, with emphasis in the general areas of biochemistry, biophysics, cell biology, developmental biology, genetics, immunology, molecular biology, neurobiology, plant molecular biology, population biology and evolution, virology, and cancer biology.

During the first year of graduate study, each student undertakes a research project in the laboratory of each of four to six different faculty members, and is expected to spend a major por-



tion of his or her academic time on this project. The laboratories are selected by the student in consultation with the graduate committee to provide a broad view of the research interests of the department. The student is also expected to enroll in the first-year graduate biology sequence which includes advanced material in genetics, molecular biology, cell biology, virology, and immunology. The only other general course requirement for the Ph.D. is a minimum of sixteen units of Biology 500 (Apprentice Teaching in Biology). Graduate students are required to participate in undergraduate teaching under the supervision of the responsible faculty member 50 percent of the time for one quarter in each year of graduate study following the first year. A program of further study, including seminars and courses appropriate to a student's background and interests, is arranged through consultation between the student and the faculty. Much reliance is placed on informal instruction through early and close association of the student with the faculty and research staff, and through regular seminars. After becoming familiar with the research activities of the faculty through the laboratory rotation program, the student begins work on a thesis research problem of his or her choice no later than the end of the first year. The student is free to choose for the thesis adviser a regular member of the UCSD faculty or an adjunct member of the Department of Biology faculty. The student is required to have completed a two-part examination in order to be admitted to candidacy for the Ph.D. degree. The purpose of the examinations is for the student to demonstrate competence in the field of major interest and in related fields of biology. The major remaining requirement for the Ph.D. degree is the satisfactory completion of a dissertation consisting of original research carried out under the guidance of a faculty member.

Close collaboration with members of the Department of Chemistry is a vital and stimulating aspect of the biology program. Additional strength and breadth in biology are gained by collaborating with the Department of Marine Biology of the Scripps Institution of Oceanography, with the Scripps Clinic and Research Foundation, and with the Salk Institute for Biological Studies.

### DEPARTMENTAL PH.D. TIME LIMIT POLICIES

Students must be advanced to candidacy by the end of five years. Total university support cannot exceed eight years. Total registered time at UCSD cannot exceed eight years.

## JOINT DOCTORAL PROGRAM WITH SAN DIEGO STATE UNIVERSITY

The Department of Biology at UCSD participates in a joint graduate program with the Department of Biology at SDSU, primarily in the areas of cell and molecular biology, and leading to the Ph.D. degree in biology. Graduate student participants in the joint doctoral program are required to spend one year enrolled at UCSD; thesis research is carried out under the supervision of the SDSU faculty.

Information regarding admission is found in the current edition of the Bulletin of the Graduate Division of San Diego State University. Applicants to the UCSD Department of Biology graduate program who check the square marked "joint doctoral program" as well as the one marked "doctorate" will be considered for admission to both programs.

## Courses

**NOTE: The department will endeavor to offer the courses as outlined below; however, unforeseen circumstances sometimes mandate a change of scheduled offerings, especially the quarter offered (F,W,S). Students are strongly advised to check the *Schedule of Classes* or with the department's Student Services Office (rm. 2322, Humanities and Social Sciences Building, (619) 534-0557) before relying on the following schedule. This is of particular importance in planning schedules for graduation requirements. It is the student's responsibility to contact the Student Affairs Office to determine the specific quarter that certain courses will be offered. The following schedule is tentative for the academic year 1992-93 only. It should not be assumed that the same schedule will continue after this academic year.**

**Attendance at the first lecture/lab is required. Non-attendance will result in the student's name being dropped from the course roster. It would be the student's responsibility to officially drop the course at the registrar's office.**

### LOWER DIVISION

#### 1. The Cell (4)

An introduction to cellular structure and function, to biological molecules, bioenergetics, to the genetics of both procaryotic and eucaryotic organisms, and to the elements of molecular biology. Three hours of lecture and one hour of recitation. *Prereq-*

*uisites: two quarters of general chemistry; the second quarter of chemistry may be taken concurrently. (F,W,S)*

#### 2. Multicellular Life (4)

An introduction to the development and the physiological processes of plants and animals. Included are treatments of reproduction, nutrition, respiration, transport systems, regulation of the internal environment, the nervous system, and behavior. Three hours of lecture and one hour of recitation. *Prerequisite: Biol. 1. (W,S)*

#### 3. Organismic and Evolutionary Biology (4)

The first principles of evolutionary theory, classification, ecology, and behavior; a phylogenetic synopsis of the major groups of organisms from viruses to primates. Three hours of lecture and one hour of lab. *Prerequisite: A full year of high school biology or Biol. 1. NOTE: E.B.E. majors should complete this course during their first year at UCSD. (F,S)*

#### 6. Classic Experiments in Modern Biology (2)

Experiments from outstanding research papers and fundamental procedures in areas of modern biology, including biochemistry, cell and molecular biology, and cellular differentiation, will be discussed in lecture. Students will be expected to read a text and journal articles related to lecture. Two hours of lecture. **This course will not satisfy any requirements for the biology major, biology minor, or college general-education purposes.** *Prerequisite: Biol. 1. (S)*

#### 7. Introduction to Plant Biology (4)

An introduction to plant biology for nonmajors. Topics will include plant growth and development, plants and the environment, agriculture, plant diseases, medicinal plants, and plant biotechnology. (W)

#### 10. Fundamental Concepts of Modern Biology (4)

An introduction to the biochemistry and genetics of cells and organisms; illustrations are drawn from microbiology and human biology. Three hours of lecture and one hour of discussion. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. (Students may not receive credit for Biol. 10 after receiving credit for Biol. 1.) (F,S)

#### 11. Introduction to Molecular and Cell Biology (4)

An introduction to the chemical basis of living systems, the chemistry and biology of macromolecules, their organization and function in cells, and the molecular basis of evolution, differentiation, and reproduction. *Prerequisites: Chem. 11 and 12, or the equivalent.* (Students may not receive credit for Biol. 11 after receiving credit for Biol. 1.) (S)

#### 12. Neurobiology and Behavior (4)

An introduction to the organization and functions of the nervous system; topics include molecular, cellular, developmental, systems, and behavioral neurobiology. Three hours of lecture and one hour of discussion. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. *Prerequisite: Biology 1, 2, 3, 10, 11, 14, 15, 16, 18, or any equivalent.* (W)

#### 13. Human Nutrition (4)

A survey of our understanding of the basic chemistry and biology of human nutrition; discussions of all aspects of food: nutritional value, diet, nutritional diseases, public health, and public policy. Three hours of lecture and one hour of discussion. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. **NOTE: Students may not receive credit for Biol. 13 after having completed Biol. 107.** (S)

#### 14. Human Physiology (4)

Introduction to the elements of human physiology and the functioning of the various organ systems. The course presents a broad, yet detailed, analysis of human physiology, with particular emphasis towards understanding disease processes. Three hours of lecture and one hour of discussion. This course



is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. *Prerequisite: Biology 10 or equivalent.* (F)

**15. Biomedicine/Microbes (4)**

General principles of microbiology, with emphasis on the cell biology of microorganisms and of the cells with which they interact in causing diseases of man and animals. A discussion of infection by bacteria, fungi and viruses, and host responses to infection. Three hours of lecture and one hour of discussion. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. (F)

**16. Biology of Human Reproduction (4)**

The topics covered are: sexual development in embryo and fetus; the nature and regulation of changes at puberty; the functioning of the mature sexual system. Three hours of lecture. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. *Prerequisite: Biol. 10.* (W)

**18. Biomedicine/Cancer (4)**

An introduction to molecular, cellular, and immunological aspects of cancer and a consideration of the sociological and psychological impact of cancer on the individual and general society. Three hours of lecture. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. (F)

**21. Human Genetics in Modern Society (4)**

Fundamentals of human genetics and introduction to modern genetic technology such as gene cloning and DNA finger printing. Applications of these techniques, such as forensic genetics, genetic screening, and genetic engineering. Social impacts and ethical implications of these applications. *Prerequisite: Biol. 1, 10, or equivalent.* (W)

**23. Horticulture and Animal Husbandry (4)**

The practical and theoretical aspects of plant and animal propagation, maintenance, and behavior in a typical Southern California farm community. Animals to be studied include bees, rabbits, sheep, goats, pigs, horses, chickens, ducks, geese, and turkeys. Behavioral and social aspects will be emphasized. Plants to be studied include a variety of fruit trees, bushes, and vegetables. Emphasis will be on propagation and culture conditions. Each student will choose a principal project and area of study. One hour lecture and fourteen hours farm work, research and/or study per week. Oral reports and final paper required. (S)

**90. Undergraduate Seminar (1)**

This seminar will be restricted to lower-division undergraduate students (freshmen and sophomores). The course will introduce current biological topics. The topics will vary with instructors and for each quarter. Examples of topics which may be discussed are: wildlife conservation, signalling within and between cells, mapping the human genome, etc. **This course will not satisfy any requirement for the biology major, biology minor, or college general-education.** (F,W,S)

UPPER DIVISION

■ **BIOCHEMISTRY**

**100. Structural Biochemistry (4)**

The structure and function of biomolecules. Includes proteins conformation, dynamics, and function; enzymatic catalysis and allosteric regulation; lipids and membranes; sugars and polysaccharides; and nucleic acids. Three hours of lecture and one hour of recitation. *Prerequisites: two quarters of organic chemistry (second quarter may be taken concurrently).* (Note: Students may not receive credit for both Biol. 100 and Chem. 114A.) (F,S)

**101. Metabolic Biochemistry (4)**

Energy-producing pathways—glycolysis, the TCA cycle, oxidative phosphorylation, photosynthesis, and fatty acid oxidation; and biosynthetic pathways—gluconeogenesis, glycogen synthesis, and fatty acid biosynthesis. Three hours' lecture and one hour recitation. *Prerequisites: two quarters of organic chemistry (second quarter may be taken concurrently).* *Biol. 100 is strongly recommended, but not required.* (Note: Students may not receive credit for both Biol. 101 and Chem. 114B.) (F,W,S)

**102. Protein Evolution (4)**

Protein structure and function. Topics include: the domain structure of proteins and the evolution of new protein activities; proteases and the regulation of biological processes such as blood coagulation; extracellular matrix proteins, including collagens, elastin, proteoglycans, fibronectin, and laminin; antibodies and the immunoglobulin superfamily; hormones and the mechanisms of hormone action. Continuation of Biochemistry 1. *Prerequisite: Biol. 101.* (W)

**103. Biochemical Techniques (4)**

A laboratory-lecture course in the application of biochemical methods to biological problems. Two hours of lecture per week during first five weeks only (ten hours altogether during the quarter) and ten hours of laboratory. *Prerequisite: Biol. 100 or 101 (may be taken concurrently).* (NOTE: Students may not receive credit for both Biol. 103 and Chem. 112A.) (F,W,S) Attendance at the first lecture/lab is required. Non-attendance will result in the student's being dropped from the course roster. It would be the student's responsibility to officially drop the course at the Registrar's Office.

**104. Physical Biochemistry (4)**

The theory and applications of physical chemistry to biological molecules, process and systems and techniques used in biochemistry and physiology. Topics include reversible and irreversible thermodynamics, bioenergetics, energy coupling and transduction, solutions of macromolecules, sedimentation, chromatography, electrophoresis, passive and active membrane transport, spectroscopy, and chemical kinetics. Three hours of lecture and one hour of recitation. *Prerequisites: calculus and organic chemistry.* (W)

**106. Molecular Biology (4)**

Molecular analysis of gene action: DNA structure, replication, transcription, protein synthesis. Regulation of gene activity. Recombination, mutation, and introduction to genetic engineering. Emphasis on prokaryotes, but with discussion of eukaryotes. Three hours of lecture and one hour of recitation. *Prerequisites: Biology 100 or 101 and 131.* (NOTE: Students may not receive credit for both Biol. 106 and Chem. 114C.) (F,W,S)

**107. Nutrition (4)**

Emphasis is on the biochemical aspects of nutrition. The known functions of vitamins, minerals, fats, carbohydrates, and protein will be discussed in terms of experiments in nutrition and an evaluation of the relation of the knowledge to nutrition in man. Three hours of lecture. *Prerequisite: Biol. 100 or 101.* (F)

**109. Topics in Biophysics/Photobiology (4) (Same as Chemistry 153 and Physics 153.)**

Basic principles of photobiology and photochemistry. Photochemical mechanisms in photosynthesis. Photoreceptor pigment systems and photobiological control mechanisms in living organisms. *Prerequisite: upper-division standing in biology, chemistry or physics, or consent of instructor.* (S)

**110. Topics in Biochemistry (4)**

An advanced course which covers in depth a specialized topic in biochemistry. Three hours of lecture. *Prerequisite: Biol. 100 or 101.* (Not offered in 1992-93.)

■ **CELL BIOLOGY**

**111. Cell Biology (4)**

The structure and function of cells and cell organelles, cell growth and division, motility, cell differentiation and specialization. Three hours of lecture and one hour of recitation. *Prerequisites: Biol. 1, 100, and 131.* (W,S)

**112. Cell Biology Laboratory (4)**

A laboratory course in the application of cellular techniques to biological problems. Ten hours of laboratory. *Prerequisite: consent of instructor and Biol. 111 (may be taken concurrently); Biol. 103 is strongly recommended.* (F) Attendance at the first lecture/lab is required. Non-attendance will result in the student's being dropped from the course roster. It would be the student's responsibility to officially drop the course at the Registrar's Office.

**113. Immunology (4)**

This course will cover both cellular and humoral aspects of the immune response. Topics include antibody structure, function, and gene regulation, T cell regulation of antibody production, T cell responses including transplantation reactions, antigen recognition, antigen presentation, immune dysfunctions leading to disease, and immune tolerance. Three hours of lecture. *Prerequisites: Biol. 100, Biol. 106, upper-division standing.* (W)

**115. Endocrinology (4)**

Topics will be hormone biosynthesis, metabolism and mechanisms of action, neuroendocrinology, regulation of intermediary metabolism and body size; water and electrolyte, calcium and phosphate homeostasis. This course is restricted to upper-division students. Three hours of lecture and one hour of discussion. *Prerequisite: Biol. 101 (may be taken concurrently).* (F)

**116. Molecular Basis of Disease (4)**

An examination of the molecular basis of human diseases. Course will emphasize inherited human disorders, and some important diseases caused by viruses. Focus on the application of genetic, biochemical, and molecular biological principles to an understanding of the diseases. Three hours of lecture. Course restricted to upper-division biology majors. *Prerequisites: Biol. 106 and Biol. 131.* (S)

■ **DEVELOPMENTAL BIOLOGY**

**121. Developmental Biology (4)**

The basic processes in embryogenesis will be considered in a variety of organisms at the levels of tissue, cellular, and molecular differentiation. The mechanisms of development will be explored. More detailed analyses of a few processes such as fertilization, sex determination, and pattern formation in *Drosophila* will be discussed. This course is open to upper-division students only. Three hours of lecture and one hour of recitation. *Prerequisites: Biol. 100, Biol. 106, Biol. 131.* (W)

**122. Human Reproduction and Development (4)**

This course is addressed to the development of the human sexual system, including gametogenesis, fertilization, and embryo implantation. Emphasis is placed on the physiology of reproductive functions. Three hours of lecture and one hour of discussion. *Prerequisites: Biol. 100 and Biol. 131.* (F)

**123. Embryology Laboratory (4)**

Descriptive and experimental embryology of marine organisms and of vertebrates. One and one-half hours of lecture and eight hours of laboratory. *Prerequisites: upper-division standing, Biol. 1 and Biol. 2 or the equivalent, and consent of the instructor.* (F,S) Attendance at the first lecture/lab is required. Nonattendance will result in the student's being dropped from the course roster. It would be the student's responsibility to officially drop the course at the Registrar's Office.

**125. Regulation of Gene Activity in Eucaryotic Cells (4)**

This course will explore problems in the regulation of gene activity in eucaryotic cells approached at the molecular level. The

course will include the organization, structure, transcription, and regulation of eucaryotic genes; mechanism of hormonal regulation in controlling gene activity; induction of gene expression in eucaryotic cells; role of signal transduction in controlling gene expression; and regulation of gene activity during differentiation in developing systems. Examples will be taken from eucaryotic microorganisms, invertebrates, as well as mammalian and other vertebrate systems. Three hours of lecture and one hour of discussion. *Prerequisite: Biol. 106.* (S)

#### 127. Fundamentals of Plant Biology (4)

An introduction to the biology of plants. Basic principles of plant anatomy, physiology, development, and diversity will be covered as well as specialized topics, including plant genetics: engineering, plant disease and stress, medicinal plants, plants and the environment, and sustainable agriculture. *Prerequisites: Biol. 1 and 2.* (F)

#### 128. Plant Cellular and Molecular Biology (4)

The cellular and molecular basis of plant development, including plant hormones, signal transduction mechanisms, light and plant growth, plant microorganism interaction, plant transformation, genetic engineering of plants. *Prerequisites: Biol. 101 required, Biol. 127 recommended.* (W)

#### 129. Plant Molecular Genetics and Biotechnology Laboratory (4)

Techniques in plant cell and tissue culture, plant transformation, genetic selection and screening of mutants, host pathogen interactions, gene regulation, organelle isolation, membrane transport. Ten hours of laboratory. *Prerequisites: Biol. 103 and 127 strongly recommended.* (S) Attendance at the first lecture/lab is required. Non-attendance will result in the student's being dropped from the course roster. It would be the student's responsibility to officially drop the course at the Registrar's Office.

### ■ GENETICS

#### 131. Genetics (4)

An introduction to the principles of heredity in diploid organisms, fungi, bacteria, and viruses. Mendelian inheritance; population genetics; quantitative genetics; linkage; sex determination; meiotic behavior of chromosome aberrations; gene structure, regulation, and replication; genetic code. Three hours of lecture and one hour of recitation. *Prerequisite: Biol. 1 or the equivalent.* (F,W,S)

#### 132. Eucaryotic Genetics Laboratory (4)

This course emphasizes the principles of Mendelian inheritance and will require the student to apply both cytological and genetic analysis to the solution of problems in transmission genetics. One hour of lecture and seven hours of laboratory. *Prerequisite: Biol. 131 (may not be taken concurrently).* (Not offered in 1992-93.) Attendance at the first lecture/lab is required. Non-attendance will result in the student's being dropped from the course roster. It would be the student's responsibility to officially drop the course at the Registrar's Office.

#### 134. Topics in Human Genetics (4)

An advanced course covering aspects of human genetics in detail and using papers from the scientific literature as the major source of information. A review of basic genetics as applied to the human species is followed by the consideration of recent genetic insights into a number of human conditions which illustrate the principles covered in the first part of the course. *Prerequisite: Biol. 131 (may not be taken concurrently); Biol. 106 is strongly recommended.* (W)

#### 136. Microbial Genetics (4)

Organization and function of procaryotic genetic systems including sex factors, transduction, transformation, phage genetics, transposons, genetic engineering. Three hours of lecture. *Prerequisites: Biol. 106, Biol. 131, and consent of instructors.* (W)

#### 138. Recombinant DNA Techniques (4)

Theory and practice of DNA cloning. This course aims at providing practical knowledge in the field of genetic engineering. Techniques covered include construction of plasmid and phage DNA libraries, screening libraries for desired DNA clones by hybridization methods, plasmid and phage DNA preparation, and DNA sequencing. Two hours of lecture, one hour of discussion, and eight hours of laboratory. *Prerequisites: Biol. 136 and consent of instructor.* (S) Attendance at the first lecture/lab is required. Non-attendance will result in the student's being dropped from the course roster. It would be the student's responsibility to officially drop the course at the Registrar's Office.

#### 139. Advanced Techniques in Molecular Genetics (4)

This course focuses upon a combined biochemical and molecular genetic approach to study current biological problems. Techniques include amplification of rare nucleic acids with the polymerase chain reaction, purification and characterization of a eucaryotic protein expressed in bacteria, *in vitro* mutagenesis of DNA. One hour of lecture and eleven hours of laboratory. *Prerequisite: Biol. 138.* (W) Attendance at the first lecture/lab is required. Non-attendance will result in the student's being dropped from the course roster. It would be the student's responsibility to officially drop the course at the Registrar's Office.

### ■ MICROBIOLOGY

#### 141. Bacteriology (4)

A discussion of the structure, growth, molecular genetics, and physiology of procaryotic microorganisms, with emphasis on the diverse activities of bacteria and on the interaction of various bacterial species with their environment. Three hours of lecture and one hour recitation. *Prerequisites: organic chemistry; Biol. 101 (may be taken concurrently).* (F)

#### 142. Laboratory in Microbiology (4)

This course emphasizes fundamental principles of microbiology. Studies with bacteria include comparative morphology and physiology; pure culture techniques; bacterial growth; spore germination; and bacteriophage infection, replication, and release. Additional studies on antibiotics and the use of bioassays are included. One hour of demonstration and seven hours of laboratory. *Prerequisites: Biol. 141 and consent of instructors.* (W) Attendance at the first lecture/lab is required. Nonattendance will result in the student's being dropped from the course roster. It would be the student's responsibility to officially drop the course at the Registrar's Office.

#### 143. Virology (4)

An introduction to eucaryotic virology, with emphasis on animal virus systems. Topics discussed include the molecular structure of viruses; the multiplication strategies of the major virus families; and viral latency, persistence, and oncology. Three hours of lecture and one hour of discussion. *Prerequisite: Biol. 106.* (W)

#### 144. Medical Microbiology (4)

This course covers basic principles and detailed aspects of microbial infectious diseases. Biochemical properties underlying microbial spread, host antimicrobial and inflammatory response, immunity, and recovery will be emphasized. Emphasis is placed upon viral and bacterial diseases, including molecular principles of pathogenesis, of host immune responses, of drug resistance, and of viral and plasmid replication. Three hours of lecture and one hour of discussion. *Prerequisites: Biol. 106 and Biol. 141; recommended: Biol. 113.* (S)

### ■ PHYSIOLOGY AND NEUROSCIENCE

#### 150. Animal Physiology Lab (4)

Experiments will be performed on membrane physiology; nerve muscle function; cardiovascular physiology; respiratory, gastrointestinal and renal physiology. Subjects include experimental

animals and humans. *Prerequisites: Biol. 1, 2, and 100 or 101. Biol. 151, 153, or 155 may be taken concurrently.* (Students who have received credit for Biol. 152 or 154 may not receive credit for Biol. 150.) One hour of lecture and nine hours of laboratory. (W) Attendance at the first lecture/lab is required. Non-attendance will result in the student's being dropped from the course roster. It would be the student's responsibility to officially drop the course at the Registrar's Office.

#### 151. Mammalian Physiology 1 (4)

Lecture course covering nervous, endocrine, muscular, cardiovascular, and excretory systems. Course emphasizes the control of systems and their interactions. Three hours of lecture and one hour of discussion. This course will be restricted to upper-division students. *Prerequisites: Biol. 1, Biol. 2, and Biol. 100 or 101.* (W)

#### 153. Mammalian Physiology 2 (4)

Lecture course covering respiratory, reproductive, and gastrointestinal systems. Emphasis is placed on interactions of organ systems for the regulation of body functions. Three hours of lecture and one hour of section per week. This course will be restricted to upper-division students. *Prerequisite: Biol. 151 or consent of instructor.* (S)

#### 155. Comparative Physiology (4)

Adaptation and evolution of the structure and function of physiological systems of animals. Three hours of lecture and one hour of section. *Prerequisites: Biol. 1, Biol. 2, and Chem. 6A-B-C or Chem. 7A-B.* (W)

#### 156. Cellular Neurobiology (4)

This course will cover the biophysics of the resting and active membranes of nerve cells. It will cover the mechanisms of sensory transduction, neuromodulation. We will also study the molecular basis of nerve cell function. *Prerequisites: Biol. 1, 2, and 100 or 101.* (F)

#### 157. Neurobiology Laboratory (4)

Current electrophysiological techniques used to study nervous systems will be taught through exercises and individual projects. One hour of lecture and ten hours of laboratory. *Prerequisite: Biol. 156, 158, or 159 (may be taken concurrently).* (F) Attendance at the first lecture/lab is required. Non-attendance will result in the student's being dropped from the course roster. It would be the student's responsibility to officially drop the course at the Registrar's Office.

#### 158. Systems Neurobiology (4)

This course will cover integrated networks of nerve cells, including simple circuits like those involved in spinal reflexes. We will study how information and motor output is integrated and processed in the brain. We will also discuss higher-level neural processing. *Prerequisites: Biol. 1, 2, and 100 or 101.* (W)

#### 159. Developmental Neurobiology (4)

We will examine the cellular and molecular basis of cell determination, neurite outgrowth, specificity, synaptogenesis, and cell death in the brain. *Prerequisites: Biol. 1, 2, and 100 or 101.* (S)

### ■ ECOLOGY, BEHAVIOR, AND EVOLUTION

#### 160. Biometry (4)

This course will provide an introduction to the use of statistics in biological problems. Topics to be covered will include parametric statistics (t-tests, correlation, regression, ANOVA), non-parametric statistics, and experimental design. Students will be introduced to statistical software on the Macintosh computer. Three hours of lecture and two hours of section. *Prerequisite: Biol. 3.* (F)

#### 162. General Ecology (4)

A study of the factors affecting species' distributions and abundances, with a special emphasis on population dynamics.

## BIOLOGY

Three hours of lecture and one hour of section. *Prerequisite:* Biol. 160 (may be taken concurrently). (W)

### 164. Sociobiology (4)

A survey of the patterns of social behavior in animals and a discussion of the ecological principles underlying the evolution of animal societies. Three hours of lecture and one hour of discussion. *Prerequisite:* Biol. 3. (S)

### 166. Animal Communication (4)

An integrated approach to animal communication, including the physics and physiology of signals, optimal strategies for signalling and receiving, and the ecological and social contexts of signal evolution. Three hours of lecture and one hour of section. *Prerequisite:* Biol. 3. (W)

### 167. Evolution (4)

Evolutionary processes are discussed in their genetic, historical, and ecological contexts. Microevolution, speciation, macroevolution, and the evolution of adaptations. Three hours of lecture and one hour of recitation. *Prerequisite:* Biol. 3 or equivalent. (F)

### 169. Principles of Conservation Biology (4)

Modern conservation biology integrates three levels of population biology knowledge—population genetics, population dynamics, and community ecology—to provide management guidance for the preservation of endangered species. This course introduces the subject in the context of case studies. Three hours of lecture and two hours of discussion. *Prerequisite:* Biol. 3. (S)

### 170. Ecology Laboratory (4)

A laboratory course to familiarize students with ecological problem solving and methods. Some sections will use the Macintosh computer lab; others will be outdoors. One hour of lecture and eight hours of lab. *Prerequisites:* Biol. 160 and Biol. 162 (may be taken concurrently). (W)

### 171. Animal Communication Laboratory (4)

Laboratory exercises will introduce students to quantitative methods of visual, auditory, and olfactory signal analysis and to lab and field studies of animal signalling. One hour of lecture and eight hours of lab. *Prerequisites:* Biol. 160 and Biol. 166. (Biol. 166 may be taken concurrently). (W)

### 172. Sociobiology Laboratory (4)

This course will deal with quantitative methods for the study of animal social behaviors. Topics include spatial patterns, mating systems, and cooperation. The course includes both lab exercises and field trips. Two hours of lecture and eight hours of lab. *Prerequisites:* Biol. 160 and Biol. 164. (Biol. 164 may be taken concurrently). (Not offered in 1992-93.)

### 173. Conservation Biology Laboratory (4)

Students will utilize, modify, and create computer software to solve conservation biology management problems. Topics included are pedigree analysis, stochastic population dynamics, community structure, and island biogeography. Two hours of lecture and eight hours of lab. *Prerequisite:* Biol. 169. (May be taken concurrently). (S)

### 174. Population Genetics (4)

The first two-thirds of the course will cover the basic theory of population genetics, including selection, genetic drift, mutation, and migration. The last one-third of the course provides an introduction to quantitative genetics, including measurements of heritability and selection. The theory is illustrated throughout with biological examples. *Prerequisite:* Biol. 131; Biology 160 recommended. (Not offered in 1992-93.)

### 175. Molecular Evolution (4)

This course deals with the evolution of genes and the molecules they encode. The role of mutation, selection, and drift at the molecular level will be discussed. Molecular phylogenies, jumping genes, viral evolution, and searches for molecular homologies are a few of the topics covered. Three hours of lecture

and one hour of discussion. *Prerequisites:* Biol. 101, 131, and 106. (Not offered in 1992-93.)

### 176. Conservation and the Human Predicament (4)

(Cross-listed with ANTH/BIO 132; however, biology majors **must** take the course as Biology 176.) An interdisciplinary discussion of the human predicament, the biodiversity crisis, and the importance of biological and environmental conservation in sustaining future societies. We explore the consequences of habitat destruction and species extinctions on the biosphere and human welfare. Three hours of lecture and one hour of discussion. *Prerequisite:* Biol. 3 or consent of instructor. (Not offered in 1992-93.)

## ■ SPECIAL COURSES

### 181. Computer Programming in Biology (4)

Use of computer programming in the analysis and presentation of biological data (computation of best value and standard deviation, histogram, least squares fitting procedure, simulation of genetic experiments, etc.) Students will learn the FORTRAN computer language and will run their programs at the Computer Center. There will be some visits to laboratories and hospitals to see applications of computers in biology and medicine. Three hours of lecture and about ten hours of homework per week; limited enrollment. *Prerequisites:* Math. 1A, B, C or equivalent. (NOTE: Students may not receive credit for both Biol. 181 and Chem. 134.) (F)

### 185. Marine Biochemistry (4)

This course examines the adaptations of marine animals on different and changing environments. The effects of deep-sea pressures, water temperature, availability of oxygen, salinity, and hydrothermal vent environments will be discussed. Three hours of lecture and one hour of discussion. *Prerequisite:* Biol. 100 or 101 or Chem. 114B or consent of instructor. (F)

### 186. Computer Analysis of Genome Information (4)

Lecture and lab are three hours. Information on genome projects via computer analysis of genome information, emphasizing DNA, RNA, and protein sequence analysis. Use of DNASYSTEM and GCG programs and databases on VAX computers; analysis of program algorithms and statistical criteria. *Prerequisites:* Biol. 100 or 101, 106, and 131. (Biol. 106 may be taken concurrently). (S)

### 190. Advanced Biology Seminars for Seniors (2)

Experts in diverse areas of biology from major universities in the U.S. and abroad will describe current research activities being conducted in their laboratories. Relevant readings will be assigned. P/NP grades only. *Prerequisites:* seniors only; concurrent enrollment in Biol. 199 or consent of instructor. (F,W,S)

### 195. Introduction to Teaching in Biology (4)

Introduction to the teaching of the basic course in biology. A student under the direction of the instructor of the course will be assigned one class section and will meet one time per week with the section. A student will also be required to attend the lecture in the course and to meet at least one time per week with the instructor of the course. Limited to upper-division students who have a B average or higher. Three hours' lecture. (P/NP grades only.) *Prerequisites:* consent of instructor and approval of department chair. *NOTE:* Applications for a Biology 195 are to be submitted to, and approved by, the Department of Biology prior to the eighth week of the quarter preceding the quarter in which the Biology 195 will be completed. No requests to be a teaching assistant will be accepted after that date. (F,W,S) **This course may be counted as one of the upper-division electives for a biology major.**

### 196. Honors Thesis in Biology (4)

Senior thesis research program. Research is conducted under the supervision of a biology faculty member. This one-year program is taken in addition to the major requirements for graduation. Upon satisfactory completion of the program, students will receive "Distinction in Biology" on their transcripts. *Prerequisite:*

*sites: senior standing, 3.7 GPA or above; prior selection for the program by a faculty member and approval by program coordinator. A department stamp will be used to monitor during registration. (F,W,S)*

### 199. Independent Study for Undergraduates (4)

Independent reading or research on a problem by special arrangement with a faculty member. (P/NP grades only.) *Prerequisites:* overall UCSD GPA of at least 3.0, minimum of ninety units, consent of instructor, and approval by department chair. *NOTE:* Applications for a Biology 199 must be submitted to, and approved by, the Department of Biology prior to the eighth week of the quarter preceding the quarter in which the Biology 199 will be completed. No Biology 199 application forms will be accepted after that date. (F,W,S) **This course may be counted as one of the upper-division electives for a biology major, providing that no other special studies courses have already been counted toward the major.**

## GRADUATE

### 200. Seminar in Biology (1)

Invited speakers from the U.S. and abroad, who are leaders in various aspects of biological research, will describe their current research. *Prerequisite:* graduate standing. (S/U grades only). (F,W,S)

### 201. Seminar in Genetics (1)

Different restricted aspects of genetics will be discussed in detail each quarter; students will participate in the presentation of material, student presentations being prepared in consultation with the responsible faculty member. *Prerequisite:* consent of instructor. (S/U grades permitted.) (F,W,S)

### 202. Seminar in Developmental Biology (1)

Seminars presented by graduate students to explore topics in specialized areas of developmental biology and to provide opportunities for students to gain experience in the organization, critical evaluation, and oral presentation of information from the literature. *Prerequisite:* consent of instructor. (S/U grades permitted.) (Quarter offered is variable, and course is not offered every year.)

### 203. Seminar in Immunology (1)

The course involves weekly seminars given by faculty, postdoctoral research fellows, and advanced graduate students concerning current research in immunology and immunochemistry. One hour of lecture. *Prerequisite:* consent of instructor. (S/U grades only). (F,W,S)

### 204. Topics in Community and Population Ecology (3)

Each quarter this course will treat a different topic on the theoretical or conceptual side of community and population ecology. Students will read materials in depth, will attend weekly discussions, and will explore theories and models with statistical, analytical, and algorithmic tools of the trade. Open to qualified undergraduates with consent of instructor. (S/U grades only.) (Quarter offered is variable, and course is not offered every year.)

### 205. Seminar in Microbial Physiology (1)

Weekly seminars and discussions led by faculty, postdoctoral fellows, and graduate students concerning recent research in the areas of structure and function of microbial cell surfaces and morphogenesis in microorganisms. *Prerequisite:* consent of instructor. (S/U grades permitted.) (S)

### 206. Topics in Biophysics and Physical Biochemistry (4)

(Same as Physics 206, Chemistry 206.) Selection of topics of current interest. Examples: primary processes of photosynthesis; membrane biophysics; applications of physical methods to problems in biology and chemistry, e.g., magnetic resonance, X-ray diffraction, fluctuation spectroscopy, optical techniques (fluorescence, optical rotary dis-



persion, circular dichroism). Topics may vary from year to year. *Prerequisite: consent of instructor.* (S/U grades permitted.) (W)

### 207. Seminar Topics in Molecular Biology (1)

Weekly presentation of recent research and developments in molecular biology by faculty, research fellows, graduate students, and visitors. *Prerequisite: graduate standing.* (S/U grades only.) (F,W,S)

### 208. Genetics Journal Club (1)

Presentation in historical perspective of current papers of their own choice from the literature of genetics (broadly interpreted) by the participants; presentation of at least one paper required. *Prerequisites: graduate standing and admission to doctoral research or consent of instructor.* (S/U grades only.) (F,W,S)

### 209. Seminar in Cell Biology (1)

Students and faculty with an interest in cell biology will meet one hour each week to present and discuss current topics in the field. Each student will be responsible for a half-hour presentation. Open only to biology graduate students. (S/U grades only.) (F,W,S)

### 211. Special Topics in Genetics (3)

Provides in-depth coverage of broad topics in the area of genetics. Topics covered in recent years include chromosome behavior, chromosome organization, developmental genetics, and human genetics. Designed for graduate students but open to qualified undergraduates. *Prerequisite: Biol. 131.* (S/U grades only.) (Quarter variable and not offered every year.)

### 212. Special Topics in Microbiology (3)

Recent developments in prokaryotic and eukaryotic microbial research. Topics vary from year to year but may include the following subjects: the molecular basis of (a) sex determination, expression, and interconversion; (b) differentiation, morphogenesis, and programmed death; (c) transcriptional and metabolic regulation; and (d) chemical macromolecular and energy-mediated reception, transmission, and response processes. The main thesis of the course is that examples of complex regulatory phenomena in higher organisms can be found in single-celled organisms. This course is open to enrollment by undergraduates. *Prerequisites: Biol. 101 and Biol. 131.* (S/U grades permitted.) This course will not be offered this year.

### 213. Topics in Conservation Biology (3)

Provides in-depth coverage of topics in population genetics and ecology, community ecology, biogeography, human ecology, and ecosystem management relevant to conservation biology. Topics vary from year to year and have included pedigree analysis, inbreeding depression, minimum viable population size, problems of overabundance, fragmented populations, keystone species, in-situ and ex-situ conservation techniques. One two-hour meeting weekly. *Prerequisite: graduate standing or consent of instructor.* (S/U grades only.) (S)

### 214. Workshop in Behavioral Ecology (3)

Hands-on experience in the analysis, modelling, and testing of hypotheses in behavioral ecology. Weekly group discussions and out-of-class projects will focus on a different theme (e.g., sexual selection, quantitative genetics, game theory, etc.) each year. Open to qualified undergraduates and graduate students with consent of instructors. (S/U grades only.) (F)

### 221A. Advanced Genetics (3)

Provides a broad, advanced-level coverage of molecular and formal aspects of genetics for first-year graduate students. Topics covered include bacterial genetics, recombination in prokaryotes and eucaryotes, mammalian somatic-cell genetics, developmental genetics, sex determination, dosage compensation, immunogenetics, etc. Eight hours of lecture-discussion. *Prerequisites: Biol. 101, Biol. 106, and Biol. 131 or the equivalent.* (Letter grades only.) (F)

### 221B. Advanced Cell Biology (4)

A coverage of modern cell biology for first-year graduate students. There is an up-to-date discussion of topics such as

structure and function of membranes; structure and function of integral membrane proteins involved in transport, ion pumps, voltage and ligand controlled ion gates, transmembrane signaling; receptor mediated endocytosis; protein synthesis and protein targeting; the role of RER and Golgi apparatus; the biosynthesis of mitochondria, lysosomes, and other intracellular organelles in animal and plant cells; the cytoskeleton and the role of its components in cell structure, motility, cell-cell interactions, and mitosis; the control of cell division (the cell cycle). Ten hours of lecture and one hour discussion of recent papers complementing the lectures. *Prerequisites: Biol. 101, 106, 111, and 131 or the equivalent.* (Letter grades only.) (F)

### 222. Advanced Molecular Biology (6)

Provides a broad, advanced-level coverage of modern molecular biology for first-year graduate students. Topics include prokaryotic and eucaryotic gene structure and regulation, chromatin structure, DNA replication, translation, mechanisms of transcription, and an introduction to viruses. OPEN ONLY TO STUDENTS ENROLLED IN A GRADUATE DEGREE PROGRAM. (Letter grades only.) (W)

### 223A. Protein Biochemistry (1)

Topics include general aspects of protein structure and evolution and the relationship between the structure and function of selected proteins. Three hours of lecture. (Letter grades only.) (W)

### 223B. Advanced Animal Virology (3)

The course follows Biology 223A, Protein Biochemistry, beginning the third week. The course will consist of a review of fundamental concepts, together with an in-depth analysis of the structure, genetics, multiplication, and oncogenicity of animal viruses. Particular emphasis will be given to the DNA and RNA tumor viruses. The format of this section will include lectures and discussion of selected papers. (Letter grades only.) (S)

### 223C. Advanced Immunology (3)

The course will be devoted to immunology and will be organized as a combined lecture-tutorial course stressing classical as well as current literature. Each week will compose an independent section. Topics will include cellular interactions involved in the immune response and the molecular biology unique to lymphoid factor and receptors. (Letter grades only.) (S)

### 223D. Advanced Topics in Plant Biology (3)

This course will cover advanced topics in plant biology in the areas of molecular genetic, developmental, and physiological biology. We will discuss plant-microbe interactions, transposable elements, protein trafficking, ion transport, and organ development. The format of this section will include lectures and discussion of selected papers. *Prerequisites: Biol. 221A, 221B, and 222.* (Letter grades only.) (S)

### 223E. Advanced Neurobiology (3)

Graduate course, presuming advanced knowledge of cell and molecular biology, which covers modern molecular, cellular, developmental, and physiological aspects of neurobiology. *Prerequisites: Biol. 221A, 221B, and 222.* (Letter grades only.) (S)

### 231. Techniques in Electron Microscopy (3)

Theoretical aspects of electron microscopy and practical training in basic techniques, including photography. Two hours of lecture and four to six hours of laboratory. Students may be interviewed by instructor before registering in this course. Open to undergraduates with consent of instructor. *Prerequisite: consent of instructor.* (S/U grades only.) (Quarter offered is variable, and course is not offered every year.)

### 232. Molecular Biology of Human Retroviruses (3)

This course consists of an in-depth review of human retroviruses (human immunodeficiency virus, HIV; and human T-cell leukemia virus, HTLV) with emphasis on their molecular biology. The format will include lectures and discussion of selected papers. *Prerequisite: Biol. 106 or the equivalent.* (S/U grades

permitted.) (S) Open to upper-division students with consent of instructor.

### 233. Cellular Immunology (3)

This course covers the molecular and cellular events in the humoral and cellular response to antigen, transplantation biology, the structure and function of the major histocompatibility gene complex, the T-cell receptor, lymphokines, and the induction of immunological tolerance. It serves as the second course in a two-part sequence. May be taken by undergraduates who have taken Part 1 (Biology 113) and by graduate students. (S/U grades permitted.) (Quarter offered is variable, and course is not offered every year.)

### 234. Developmental Neurobiology (3)

Cellular and developmental aspects of the nervous system. Methods of investigation and culture approaches. Basic neuroembryology and selected examples of regional developments. Neuroglial cells and neuroglia interactions. Extrinsic controls of survival, growth and maturation of neural cells. Neurite growth and synapse formation. Potential for plasticity and regeneration in the nervous system. (S/U grades permitted.)

### 235. Biology and Biochemistry of Cancer Cells (2)

This course will cover recent advances in cell biology, biochemistry, immunology, and virology as they relate to cancer cells and their interaction with the host. Cancer research specialists from outside will be brought in to discuss the most recent evidence and interpretations in key areas of cancer research. This course will meet two hours per week for lecture and discussion. It will be at an advanced graduate level but will be open to a limited number of seniors (with permission of instructor) on a P/NP basis. (S/U grades only.) (Quarter offered is variable, and course is not offered every year.)

### 236. Molecular Glycobiology (2)

Molecular glycobiology encompasses studies of the structure, biosynthesis, and biological roles of oligosaccharide units on glycoconjugates. This course will provide an overview of this rapidly evolving field with an emphasis on the glycoconjugates of eucaryotic organisms in the animal kingdom. (S/U grades permitted.) This course is cross-listed with Medicine 225. (S)

### 241. Membrane Neurophysiology and Biophysics (3)

Morphological, biochemical molecular, and physiological basis for testing potentials, receptor potentials, synaptic potentials, and action potentials. (S/U grades only.) (S) (Offered in a three-year cycle with Biology 242 and 243.)

### 242. Cellular and Synaptic Neurophysiology (3)

Factors which influence the establishment and maintenance of cellular and synaptic function in the nervous system. Emphasis on cellular, developmental, and molecular neurobiology. (S/U grades only.) (S) (Offered in a three-year cycle with Biology 241 and 243.)

### 243. Systems Neurophysiology (3)

Ways in which neurons are assembled into circuits to achieve perception and patterned movement. (S/U grades only.) (S) (Offered in a three-year cycle with Biology 241 and 242.)

### 244. Topics in Developmental Neurobiology (3)

Weekly presentations of recent papers on the development of the nervous system. (S/U grades only.) (W)

### 245. Readings in Neurobiology (3)

Weekly presentation of recent journal articles by faculty and students. (S/U grades only.) (F,S)

### 246. Neurobiology Seminar (3)

Presentation of current research by local and visiting neurobiologists. (S/U grades only.) (F,W,S)

### 248. Anatomical and Physiological Methods in Neurobiology (3)

Survey of contemporary anatomical and physiological methods and how to apply them in answering basic questions in neuro-

## BIOMEDICAL SCIENCES

biology. *Prerequisites: open to graduate students and seniors with consent of instructors. (S/U grades only.) (S)*

### 251. Molecular Biology (3)

The first section of this course consists of a review of fundamental concepts in molecular biology together with an in-depth analysis of molecular biological topics of medical importance. The second section covers the structure, genetics, and multiplication of animal viruses, with particular emphasis on the DNA and RNA tumor viruses. Other subjects discussed will include viral persistence, latency, and approaches to viral chemotherapy. Three hours of lecture. *Prerequisite: biochemistry. (Not open to undergraduates.) (S/U grades only.) (F)*

### 252. Genetics (3)

Human genetics, with emphasis on basic principles. Topics covered include chromosome abnormalities, the mechanisms of dominant and recessive diseases, pedigree analysis, ascertainment of linkage, the interaction of genotype with diseases. Mechanisms of maintaining genetic diversity in human populations will be discussed along with recent approaches to genetic counseling and intervention. *Prerequisite: consent of instructor. (Not open to undergraduates.) (S/U grades only.) (F)*

### 253. Immunology (3)

Graduate students will explore topics in specialized areas of immunochemistry and cellular immunology, antigenic and molecular structure of immunoglobulin molecules; antigen-antibody interactions; cellular events in the humoral and cellular immune responses; translation immunology. *Prerequisite: consent of instructor. The course is similar in content to Biology 113 but is accelerated in pace. (S/U grades permitted.) (F)*

### 254. Cell and Membrane Physiology (3)

This course is a survey covering current subjects in membrane biology relevant to medicine. Subjects to be included: 1) membrane isolation, composition, and structure; 2) consequences of membrane fluidity (mode of action of anesthetics, intercellular communication, exo- and endo-cytosis biogenesis); 3) sensory perception and response (chemo- and energy reception, cellular neurophysiology, muscle physiology); 4) regulation of membrane function (hormone reception, intercellular adhesion, neoplastic transformation). *Prerequisites: biochemistry and genetics. (S/U grades only.) (F)*

### 255. Clinical Correlates (2)

Clinical correlates will stress the close ties between clinical medicine and basic science and the two-way interactions among practicing doctors and research scientists. Most sessions will start with the presentation of a clinical case by an attending practitioner and an analysis by the clinician of the basic principles demonstrated by each case. There will follow an extended period of open discussion between basic scientists, clinicians, and students. *Prerequisites: graduate students only, Biol. 251, Biol. 252, Biol. 253, and Biol. 254 to be taken simultaneously. (S/U grades only.) (F)*

### 256. Cellular Neurobiology (2)

A graduate component of Biology 156A. Students read modern and classic papers from the literature that complement or form the basis of the undergraduate lectures which they are encouraged to attend. *Prerequisite: consent of instructor. (S/U grades only.) (F)*

### 258. Systems Neurobiology (2)

A graduate component of Biology 156B. Students read modern and classic papers from the literature that complement or form the basis of the undergraduate lectures which they are encouraged to attend. *Prerequisite: consent of instructor. (S/U grades only.) (W)*

### 259. Molecular/Developmental Neurobiology (2)

A graduate component of Biology 156C. Students read modern and classic papers from the literature that complement or form the basis of the undergraduate lectures which they are encour-

aged to attend. *Prerequisite: consent of instructor. (S/U grades only.) (S)*

### 271. Advanced Experimental Methods in Biology (4-12)

Advanced laboratory and/or field experience in contemporary biological methodology. Open only to students enrolled in the Integrated Bachelor's/Master's Degree Program. *Prerequisites: consent of instructor and approval of department chair. (Letter grades only.) (F,W,S) NOTE: Applications for a Biology 271 are to be submitted to, and approved by, the Department of Biology prior to the eighth week of the quarter preceding the quarter in which the Biology 271 will be completed. No Biology 271 application forms will be accepted after that date.*

### 297. Research Conference (1-3)

Group and individual discussion of research activities and of current literature. *Prerequisite: graduate standing. (S/U grades only.) (F,W,S)*

### 298. Laboratory Projects in Biology (3-12)

An introduction to contemporary laboratory techniques and research interests through independent, original projects under the direction of individual faculty members. *Prerequisite: consent of instructor. (F,W,S)*

### 299. Thesis Research in Biology (1-12)

(F,W,S)

### 500. Apprentice Teaching (4)

This course involves participation in upper-division undergraduate teaching at the level of assuming responsibility for recitation sections or laboratories under the supervision of the responsible faculty member. Some experience in lecturing to upper-division classes will occasionally be provided. (S/U grades only.) (F,W,S)

## BIOMEDICAL SCIENCES

OFFICE: 5008 Basic Science Building, School of Medicine

### Professors

Roland C. Blantz, M.D., *Medicine*  
Colin M. Bloor, M.D., *Pathology*  
Robert A. Brace, Ph.D., *Reproductive Medicine*  
Joan Heller Brown, Ph.D., *Pharmacology*  
Marvin R. Brown, M.D., *Medicine*  
Webster K. Cavenee, Ph.D., *Medicine*  
Shu Chien, M.D., Ph.D., *AMES and Medicine*  
James W. Covell, M.D., *Medicine and Bioengineering*  
Edward Dennis, Ph.D., *Chemistry*  
Wolfgang H. Dillmann, M.D., *Medicine*  
Vincent E. Dionne, Ph.D., *Pharmacology*  
Mark H. Ellisman, Ph.D., *Neurosciences*  
Scott Emr, Ph.D., *Medicine*  
Gregory F. Erickson, Ph.D., *Reproductive Medicine*  
Ronald M. Evans, Ph.D., *Adjunct/Biology*  
Darrell D. Fanestil, M.D., *Medicine*  
Marilyn Farquhar, Ph.D., *Pathology*  
James R. Feramisco, Ph.D., *Pharmacology and Medicine*  
Theodore Friedmann, M.D., *Pediatrics*  
Gordon N. Gill, M.D., *Medicine*

Mehran Goulian, M.D., *Medicine*  
Philip Groves, Ph.D., *Psychiatry*  
A. F. Hofmann, M.D., Ph.D., *Medicine*  
Stephen B. Howell, M.D., *Medicine*  
Paul A. Insel, M.D., *Pharmacology*  
Martin F. Kagnoff, M.D., *Medicine*  
Michael Karin, Ph.D., *Pharmacology*  
Ronald Kuczenski, Ph.D., *Psychiatry*  
Hyam L. Leffert, M.D., *Pharmacology*  
Daniel T. O'Connor, M.D., *Medicine*  
Jerrold M. Olefsky, M.D., *Medicine*  
George Palade, Ph.D., *Medicine*  
Morton P. Printz, Ph.D., *Pharmacology*  
Samuel I. Rapaport, M.D., *Medicine*  
Douglas D. Richman, M.D., *Medicine/Pathology*  
M. Geof Rosenfeld, M.D., *Medicine*  
Geert Schmid-Schoenbein, Ph.D., *AMES and Medicine*  
Jerry A. Schneider, M.D., *Pediatrics*  
David S. Segal, Ph.D., *Psychiatry*  
Daniel Steinberg, M.D., Ph.D., *Medicine*  
Charles F. Stevens, Ph.D., *Adjunct/Pharmacology*  
Palmer W. Taylor, Ph.D., *Pharmacology*  
Roger Y. Tsien, Ph.D., *Pharmacology*  
Wylie W. Vale, Ph.D., *Adjunct/Medicine*  
Ajit P. Varki, M.D., *Medicine*  
Peter D. Wagner, M.D., *Medicine*  
Gernot Walter, Ph.D., *Pathology*  
John F. Ward, Ph.D., *Radiology*  
Stephen I. Wasserman, M.D., *Medicine*  
John B. West, M.D., Ph.D., *Medicine*  
Tony L. Yaksh, Ph.D., *Anesthesiology and Pharmacology*

### Associate Professors

Laurence L. Brunton, Ph.D., *Medicine/Pharmacology*  
Thomas E. Carew, Ph.D., *Adjunct/Medicine*  
Pojen Chen, Ph.D., *Medicine*  
Kenneth R. Chien, M.D., Ph.D., *Medicine*  
Mario Chojkier, M.D., *Medicine*  
John C. Khoo, Ph.D., *Adjunct/Medicine*  
Richard Lieber, Ph.D., *Surgery*  
Carol MacLeod, Ph.D., *Medicine*  
Odile Mathieu-Costello, Ph.D., *Medicine*  
Stephen J. Pandol, M.D., *Medicine*  
Sampath Parthasarathy, Ph.D., *Adjunct/Medicine*  
Frank L. Powell, Ph.D., *Medicine*  
Robert H. Tukey, Ph.D., *Medicine and Pharmacology*  
Virgil L. Woods, Jr., M.D., *Medicine*  
Maurizio Zanetti, M.D., *Medicine*

### Assistant Professors

Kim E. Barrett, Ph.D., *Medicine*  
Christopher Glass, M.D., Ph.D., *Medicine*  
Brian D. Guth, Ph.D., *Adjunct/Medicine*  
Diana L. Marquardt, M.D., *Medicine*  
Harvey Motulsky, Ph.D., *Pharmacology*



Michael E. Rosenfeld, Ph.D., *Adjunct/Medicine*  
Alexis Traynor-Kaplan, Ph.D., *Adjunct/Medicine*

**Research Biochemist**

Ray C. Pittman, Ph.D., *Medicine*

**THE GRADUATE PROGRAM**

The graduate program offered by the Group in Biomedical Sciences is designed to lead to the Ph.D. degree through a combination of didactic study, laboratory rotations, and thesis research in basic biomedical sciences. Research experiences are wide and varied, permitting students the options of selecting molecular, cellular, or organ system approaches in their research programs. Students are encouraged to design and execute investigation in a self-critical and independent manner. Undergraduate preparation must include courses in mathematics (through calculus), chemistry (including organic, physical, and biochemistry), and if possible, participation in undergraduate research. Students whose undergraduate backgrounds are significantly different will be considered provided there is sufficient evidence of interest in physiology, pharmacology, or eukaryotic regulatory biology, and a desire to enter a field of active research and academic excellence.

**DOCTORAL DEGREE PROGRAM**

During the first two years, the students take basic courses in cellular biology, molecular biology, pharmacology, and physiology. In a required laboratory rotation program, students develop laboratory skills and the ability to formulate scientific hypotheses and become familiar with the research activities of the faculty. Required advanced courses and electives in subsequent years are chosen to develop the students' interest and specialized knowledge in the thesis research area. The thesis laboratory is selected by the middle of the second year of graduate study.

The graduate program is interdepartmental and interdisciplinary; it involves faculty of the Departments of Medicine, Pharmacology, Neurosciences, Reproductive Medicine, Chemistry, Pathology, and the AMES Bioengineering Group. Physiological studies within the group span wide and diverse areas, including cardiovascular, renal, and respiratory physiology, lipid metabolism and hypertension, reproductive and fetal physiology, and studies of peripheral microcirculation. Pharmacologic studies of drug action at the molecular and biochemical levels include studies of receptors (autonomic and peptidergic), genetic methods to analyze hormone-receptor interactions, endogenous hormone systems, and electrophysiological approaches to a definition of

neurotransmitter and hormone action. Eukaryotic regulatory biologists are using the most advanced molecular biological techniques to study developmental and homeostatic regulation of gene expression in primarily mammalian systems. As evidence of the research strength of the group, faculty within the program are the directors of three specialized centers of research at the university focusing on myocardial ischemia, hypertension, and atherosclerosis. Other faculty are directors of training grants for programs in pulmonary physiology, cardiovascular physiology, pharmacology, hypertension, metabolic diseases, and molecular biology.

The graduate program in biomedical sciences is also designed to educate physician-scientists through the School of Medicine's Medical Scientist Training Program. Students already admitted to the School of Medicine are eligible for admission to our program for Ph.D. training. Such students generally apply in the first or second year of their medical studies and enter graduate studies following completion of their second year of medical school. Normative time for M.D./Ph.D. students is seven years.

**EXAMINATIONS**

Students obtain letter grades in the program's basic courses. Candidacy for the Ph.D. degree is determined by a two-part examination. The first part, the minor proposition examination, tests the student's competence and ability to design a pertinent research problem in an area unrelated to his or her major interest. The second part, the major proposition examination, deals with the dissertation problem and should be completed between the spring of the third year and the beginning of the fourth year of residence in the program. After the preparation of the dissertation, an oral defense of the thesis completes the requirement for the Ph.D. degree. Ph.D. time limit policies are pre-candidacy (four years), support (seven years), and total registered time (eight years).

**Courses**

**206. Organ Physiology (9)**

Building on the student's basic knowledge of cellular biology and biochemistry, this course develops fundamental concepts of organ physiology. Major areas include autonomic, cardiovascular, gastrointestinal, renal, and respiratory physiology. Clinical correlation sessions relate physiological principles to clinical situations. *Prerequisites: BMS 210, 211, 212, 213 or equivalent background in biology and chemistry. For students not in the School of Medicine, consent of instructor. (W)*

**206L. Organ Physiology and Pharmacology, Laboratory Course (3)**

Selected laboratory exercises demonstrating basic principles of pharmacology and organ physiology. Subjects covered include

electrocardiography, hemodynamics, myocardial control mechanisms, pulmonary function, dose-response relationships in pharmacology, autonomic mechanisms, and other aspects of physiology and pharmacology. *Prerequisites: cell biology and biochemistry or equivalent, and consent of instructor. (W)*

**208A-B. Topics in Medical Therapeutics (1-2)**

Students attend pharmacology (medical therapeutics) lectures given in conjunction with those presented in core courses. Correlation with pathophysiology of diseases will be stressed including organ malfunction as causes of drug toxicity. Other topics will include chemotherapeutic agents and cardiovascular drugs. (W,S)

**210. Cellular Biology (6)**

The course focuses on fundamentals of the biology of eukaryotic cells. Topics include: Cell structure and cytoskeleton, biosynthesis of macromolecules, transport across cell membranes, receptors and signal transduction, regulation of the cell growth cycle, early development and differentiation. (F)

**211. Molecular Biology (6)**

The course covers concepts and techniques of molecular biology. Topics include: DNA and chromosome structuring, the eukaryotic genome, gene transcription units and their regulation, RNA processing, RNA and DNA viruses, development and methodologies of molecular biology. (W)

**212. Cellular and Molecular Pharmacology (6)**

Topics include: Analysis of ligand-macromolecule interactions, biochemistry and pharmacology of chemical transmission and signal transduction, cellular responses to environmental stress (cyto P-450, P-glycoprotein, etc.), and bases of selective toxicity (viruses, bacteria, insects, mammalian tumor cells). Emphasis is on basic principles, on analysis of recent experimental data, and on integration in mammalian systems. (W)

**213. Systemic Physiology (6)**

General principles of organ physiology including mass transport, tissue and fluid mechanics, membrane transport, energetics, structure-function relations, and homeostasis applied to cardiovascular, gastrointestinal, muscle, renal, and respiratory systems. Emphasis on integrative properties of cells in organs and organismic responses. (F)

**220A-B. Principles of Pharmacology (2-3)**

Building on the student's knowledge in cell biology and biochemistry, this course examines the principles of pharmacology and therapeutics and relates them to clinical practice. The portion of the course given in the winter quarter is closely integrated with the organ physiology course. Same prerequisites as 206. (W,S)

**222. Molecular Glycobiology (2)**

Molecular Glycobiology encompasses studies of the structure, biosynthesis, and biological roles of oligosaccharide units on glycoconjugates. The course will provide an overview of this rapidly evolving field with an emphasis on the glycoconjugates of eukaryotic organisms in the animal kingdom. (S)

**223. Genetics, Metabolism, and Inherited Disease (2)**

Detailed discussions of the molecular aspects of certain inborn errors of intermediary metabolism selected to illustrate principles of biochemical genetics applicable to a wider variety of clinically important genetic diseases. Individual sessions will include faculty presentations followed by student-led discussions of the particular principles illustrated by the disorders reviewed. (S)

**225. Physiological Aspects of the Ovary (3)**

This course deals with recent concepts concerning structure-function relationships in the mammalian ovaries. Contents include: history, development, cytology, steroid biosynthesis and function, hormone receptor interactions, oogenesis, folliculogenesis, ovulation, corpus luteum formation/regression, menstrual cycle, menopause, pathophysiology. (W)

## BIOPHYSICS

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### 226. Frontiers in Endocrinology and Metabolism (3)

The course covers recent advances of research in lipid, lipo-protein metabolism, carbohydrate metabolism, reproductive medicine, diabetes mellitus, and atherosclerosis. (F)

### 227. Neuroendocrinology (4)

This course will examine the role of the CNS in controlling reproductive functions, stress, growth, biological rhythm, and behavior. Materials to be covered include: the evolution of neuroendocrine hormones; development and maturation of the neuroendocrine system; neuroendocrine techniques; neuroanatomy; physiological actions of neuropeptides; the nature of aminergic and peptidergic neurotransmission in the brain in modulating the output of hormones of the pituitary; cellular and molecular mechanisms of neuroendocrine function. (S)

### 228. Seminar in Cardiovascular Physiology (1)

This seminar surveys cardiovascular physiology with the emphasis on structure, mechanics, and energetics of cardiac muscle. An introduction to the theoretical basis of the fundamental approach to research problems in cardiovascular physiology is provided. *Prerequisites:* BMS 206 and 206L and consent of instructor. (F,W,S)

### 229. Methods in Pharmacology (3)

A combination of lecture and lab exercises presented by the faculty of the Group in Biomedical Sciences, designed to introduce biomedical science graduate students to the essential techniques employed in molecular and cellular pharmacology. *Prerequisites:* BMS 212, OP, CBB, biochem., molec. biol., biomedical sciences or consent of instructor. (S)

### 230. Neuropharmacology and Receptor Mechanisms (3)

An examination of the molecular and biochemical bases of drug and neurotransmitter action. The fall-quarter course is devoted to receptor mechanisms, neuropharmacology, and drug action on excitable tissues. *Prerequisite:* course in biochemistry. (F)

### 231. Selected Topics in Pharmacology (2)

Fundamental concepts of modern biochemical and molecular pharmacology are given. Different areas covered each quarter include ion channels and pumps, membrane energetics, nucleotide cyclases, Na<sup>+</sup>-mediated solute transport, enzymatic protein modification and hepatic drug metabolism, chemical carcinogenesis, lipid modulators, chemotherapy, and receptor/ligand interactions. *Prerequisites:* advanced biochemistry, molec. biology, or consent of instructor. (F,W,S)

### 232. Introduction to Computers in Pharmacology (2)

Brief introduction to basic programming on microcomputers. Course will be limited to six students who will independently develop a moderately complex program with individual help from instructor. Lectures devoted to application of computers to research in pharmacology will be included. (S)

### 236. Maternal and Placental Physiology (2)

This course provides a broad based coverage of the physiology of maternal changes during pregnancy as well as physiology of the placenta. Included are endocrine, cardiovascular, respiratory, fluid balance, metabolism, nutrition, lactation, immune and postpartum aspects as well as problems of pregnancy. *Prerequisites:* Med. 206 (OPP) and Med. 209 (ERM), or equivalent. (F)

### 237. Fetal Physiology (2)

This course provides a broad based coverage of the physiology of the fetus, including growth and development, metabolism, neurologic and endocrine development, regulation of the cardiovascular, endocrine, renal, and gastrointestinal systems, development of the lungs, immune system, abnormal development genetic problems, and diseases. *Prerequisites:* same as 236. (W)

### 239. Practical Design and Evaluation of Biomedical Research (2)

Strategy, tactics, and critical analysis of biomedical research including 1) how to evaluate whether an idea for an experiment is worth pursuing, 2) fundamentals of experimental design, 3) experimental analysis, and most importantly, 4) how to read and critically evaluate biomedical research reports. *Prerequisite:* SOM 203, equivalent, or consent of instructor. (W)

### 240. Advanced Physiology (3 per Quarter)

Courses will cover aspects of advanced cardiovascular, respiratory, renal, and comparative physiology. *Prerequisites:* BMS 213, 206 and 206L or School of Medicine 206 and 206L. (F,S)

### 241. Neuroreflex Control of Cardiovascular and Respiratory Systems (3)

Topics covered in this course include experimental techniques, CNS respiratory and cardiovascular mechanisms, reflex modulation of breathing, arterial, visceral and somatic cardiovascular reflexes, pathophysiology, cardiorespiratory interactions, control systems theory. The course emphasizes the experimental basis of our knowledge and general principles applicable to other physiological systems. (S)

### 244. Development of Ideas in Physiology and Pharmacology (2)

Course will cover aspects of the development of ideas in physiology and pharmacology. (W)

### 245. Mathematical Methods in Physiology and Pharmacology (3)

The formulation and solution of differential equations applied to basic time-dependent phenomena commonly encountered in physiological and pharmacological research will be covered. Laplace methods. *Prerequisite:* college calculus. (F)

### 262. Neurophysiology (4)

An overview of neurophysiological systems, emphasizing mammalian neurophysiology and related model vertebrate systems and concepts. (W)

### 271. Introduction to Cardiovascular Physiology (3)

Physical concepts of behavior of heart, large blood vessels, vascular beds in major organs, and microcirculation. Included will be the physical and physiological principles of blood flow, blood pressure, cardiac work, electrophysiology of the heart, descriptions of special vascular beds including their biological and hemodynamic importance. Integration of separate components through nervous and humoral controls will be analyzed. (W)

### 285. Statistical Inference in the Medical Sciences (3)

A first course in statistical procedures for the medical sciences. Topics will be chosen from among paired comparisons, experimental design, quantal design, bioassay, counts, regression and correlation, analysis of variance, survivorship. Some emphasis will be given to computational techniques. *Prerequisite:* high school algebra. (S)

### 294. Pharmacology and Molecular Biology Journal Club (0-1)

Current literature in molecular pharmacology and molecular biology is reviewed. Two papers are chosen per week for oral presentation by students. Faculty critique the student presentations. *Prerequisite:* enrollment in Ph.D. program at year two and above. (F,W,S)

### 295. Pharmacology Research Discussions (0-1)

Student, faculty, and fellow discussion groups on research projects. Students are expected to present research findings to fellows, other Ph.D. students, and faculty. Written critiques are provided by the faculty. *Prerequisite:* completion of minor proposition examination and two years of graduate work. (F,W,S)

### 296. Directed Reading (1-4)

Reading of special topics under the direction of a faculty member. Exact subject matter to be arranged in individual cases. *Prerequisite:* consent of instructor.

### 297. Graduate Seminar (1)

For first-year graduate students. Each week a different faculty member will discuss his or her research in the broad areas of physiology, pharmacology, or molecular biology. For advanced graduate students: discussion of current research and pertinent literature on a rotating basis. *Prerequisite:* consent of instructor. (F,W,S)

### 298. Directed Study (1-12)

Reading and laboratory study of special topics under the direction of a faculty member. Exact subject matter to be arranged in individual cases. (F,W,S)

### 299. Independent Study or Research (1-12)

Independent study or research. *Prerequisite:* consent of instructor. (F,W,S)

## BIOPHYSICS

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### OFFICES:

General Administration—1060-113 Urey Hall Addition

Graduate Student Affairs—1060-121 Urey Hall Addition

Undergraduate Student Affairs—1060-115 Urey Hall Addition

Chair's Office—1060-113 Urey Hall Addition

The Department of Physics offers an undergraduate and graduate program which prepares students for a career in biophysics and which leads to the following degrees:

B.S. in physics with specialization in biophysics

B.S. in physics with specialization in biophysics-premedical

C.Phil. in physics (biophysics)

Ph.D. in physics (biophysics)

A grade-point average of 2.0 or higher in the upper-division major program is required for graduation. All courses (lower and upper division) required for the major must be taken for a letter grade. Students must receive a grade of C- or better in any course to be counted toward fulfillment of the major requirements. In exceptional cases, students with a grade-point average in the major of 2.5 or greater may petition to have one grade of D accepted.

## THE UNDERGRADUATE PROGRAM

### PHYSICS MAJOR WITH SPECIALIZATION IN BIOPHYSICS

The upper-division program for physics majors with specialization in biophysics is essentially the same as the standard physics major,

with some modification to provide the education in biology and chemistry needed for advanced work in biophysics. Students entering the program with deficient backgrounds in mathematics or chemistry will be required to remedy the deficiency in their junior year. The consequent rearrangement of the upper-division program will be devised by consultation between the student and the departmental adviser for biophysics.

Students may wish to incorporate a small portion of the major program into their lower-division studies, for example, Physics 105 and Mathematics 110.

The following courses are required for the physics major with specialization in biophysics.

a. Lower-division:

(1) Physics 4A-B-C-D-E and 2CL-DL; or Physics 2A-B-C-D and 2CL-DL (Physics 4 sequence is strongly recommended). (2) Chemistry 6A-B-C or 7A-B; and Chemistry 6BL-CL. (3) Biology 1. (4) Mathematics 2DA-EA-F, or 2DH-EH-FH.

b. Upper-division:

(1) Physics 100A-B-C, 105, 110A, 120A-B, 130A-B, 153. (2) Chemistry 131, 140A-B, 143A. (3) Biology 101, 103, 106, 111, 131. (4) Mathematics 110.

c. Suggested schedule is:

FALL	WINTER	SPRING
<b>JUNIOR YEAR</b>		
Phys. 100A	Phys. 100B	Phys. 100C
Phys. 105	Phys. 120A	Phys. 120B
Phys. 110A	Chem. 140B	Chem. 143A
Chem. 140A		
<b>SENIOR YEAR</b>		
Phys. 130A	Phys. 130B	Phys. 153
Biol. 101	Chem. 131	Biol. 103
Biol. 131	Biol. 106	Biol. 111

**PHYSICS MAJOR WITH SPECIALIZATION IN BIOPHYSICS-PREMEDICAL**

The upper-division program for physics majors with specialization in biophysics-premedical is essentially the same as the standard physics major, with some modification to provide the education in biology and chemistry needed for the study of medicine. Students entering the program with deficient backgrounds in mathematics or chemistry will be required to remedy the deficiency in their junior year. The consequent arrangement of the upper-division program will be devised by consultation between the student and the physics departmental adviser for biophysics.

Students may wish to incorporate a small portion of the major program into their lower-division studies, for example, Physics 105 and Mathematics 110.

The following courses are required for the physics major with specialization in biophysics-premedical:

a. Lower-division:

(1) Physics 4A-B-C-D-E and 2CL-DL; or Physics 2A-B-C-D and 2CL-DL (Physics 4 sequence is strongly recommended). (2) Chemistry 6A-B-C, or 7A-B; and Chemistry 6BL-CL. (3) Biology 1. (4) Mathematics 2DA-EA-F, or 2DH-EH-FH.

b. Upper-division:

(1) Physics 100A-B-C, 105, 110A, 120A-B, 130A, 153. (2) Chemistry 126 or 131, 140A-B, 143A. (3) Biology 101, 106, 111, 131. (4) Mathematics 110. (5) Restricted elective: one biology course (Biology 121, 122, or 125).

c. Suggested schedule:

FALL	WINTER	SPRING
<b>JUNIOR YEAR</b>		
Phys. 100A	Phys. 100B	Phys. 100C
Phys. 105	Phys. 120A	Phys. 120B
Phys. 110A	Chem. 140B	Chem. 143A
Chem. 140A		Math. 110
<b>SENIOR YEAR</b>		
Phys. 130A		Phys. 153
Biol. 101	Chem. 126 or 131	Restr. Elec.
Biol. 131	Biol. 106	Biol. 111

**THE GRADUATE PROGRAM**

Research in biophysics is being actively pursued in several departments (e.g., physics, chemistry, biology), which also offer courses in or relevant to biophysics. Students interested in working toward a graduate degree in an area of biophysics receive their degrees from the department of their thesis supervisor.

Graduate students specializing in the area of biophysics within the Department of Physics receive the Ph.D. in physics (biophysics).

**DOCTORAL DEGREE PROGRAM**

The Ph.D. program consists of graduate courses, apprenticeship in research, teaching experience, and thesis research.

Entering students are assigned a faculty adviser to guide them in their program. Many students spend their first year as teaching assistants or fellows and begin apprentice research in their second year. When a student's association with a research area and research supervisor is well established, a faculty research progress committee is formed with the responsibility of conducting an annual review of progress and, at the appropriate time, initiating the formation of a doctoral committee. After three years of graduate study, or earlier, students complete the departmental examinations and begin thesis research. There is no foreign language requirement.

**ENTRANCE TESTING**

An entrance test covering undergraduate physics is given to entering graduate students during registration week for the purpose of enabling the faculty to give them better guidance in their graduate work. Performance on this test has no bearing on the students' status in graduate school.

**REQUIREMENTS FOR THE PH.D.**

Students are required to pass a written examination, advanced graduate courses, an oral topic examination, a qualifying examination, and a final defense of the thesis as described below.

**1. Departmental Written Examination**

Biophysics students are required to take a written examination after completing two years of graduate work at UCSD. The examination is on the level of material usually covered in upper-division courses and the graduate courses listed below:

**Fall**

Phys. 200A (Theoretical Mechanics)  
Phys. 201 (Mathematical Physics)  
Phys. 212A (Quantum Mechanics)

**Winter**

Phys. 200B (Theoretical Mechanics)  
Phys. 203A (Adv. Classical Electrodynamics)  
Phys. 212B (Quantum Mechanics)

**Spring**

Phys. 203B (Adv. Classical Electrodynamics)  
Phys. 210A (Equilibrium Statistical Mechanics)  
Phys. 212C (Quantum Mechanics)

The examination is offered twice a year, at the beginning of the fall and spring quarters, and lasts two days, four hours per day. The examination may be repeated once, the next time it is offered.

**2. Advanced Graduate Courses**

Biophysics students are required to take six courses from biology, biochemistry, chemistry, or physics in consultation with their adviser no later than the end of the third year of graduate work. At least three of these courses must be graduate courses. A 3.0 average in five of the six courses is required. (In lieu of the course requirement, students may petition to take an oral examination covering three areas of physics.)

**3. Oral Topic Examination**

Biophysics students are required to take an oral topic examination no later than the spring of the third year of graduate work. Three topics of current interest in physics or biophysics are announced two weeks prior to the examination

week, and a list of relevant references is supplied. Students select one of the topics and present a one-half-hour talk on it to a faculty examination committee. The oral presentation is followed by approximately one hour of questioning generally related to the topic. This examination is offered twice a year, at the beginning of the fall and spring quarters, and may be repeated once, the next time it is offered.

#### 4. Qualifying Examination and Advancement to Candidacy

In order to be advanced to candidacy, students must have met the departmental requirements and obtained a faculty research supervisor. At the time of application for advancement to candidacy, a doctoral committee responsible for the remainder of the student's graduate program is appointed by the Graduate Council. Members of the research progress committee are usually included as members of the doctoral committee. The committee conducts the Ph.D. qualifying examination during which students must demonstrate the ability to engage in thesis research. Usually this involves the presentation of a plan for the thesis research project. The committee may ask questions directly or indirectly related to the project and questions on general physics which it determines to be relevant. Upon successful completion of this examination, students are advanced to candidacy and are awarded the C.Phil. degree.

#### 5. Teaching Requirement

All students are expected to participate in the physics undergraduate teaching program. After passing the departmental examinations and course requirements and before completing a dissertation, students are required to take a total of no fewer than two units of Physics 500 (Physics Instruction). Each unit corresponds to approximately five hours per week for one quarter in laboratory sections, recitation sections, or problem sessions. (This requirement may be waived in special cases by the vice chair, education.)

#### 6. Thesis Defense

When students have completed their theses, they are asked to present and defend them before their doctoral committees.

#### Time Limits for Progress to the Ph.D.

In accordance with university policy, the Department of Physics has established the following time limits for progress to the Ph.D. A student's research progress committee helps ensure that these time limits are met.

	Theorists	Experimentalists
Advancement to Candidacy	4 years	5 years
Total Registered Time and Support	7 years	8 years

## Courses

Please refer to listings in the Departments of Biology, Biochemistry, Chemistry, and Physics.

## CHEMISTRY

Chair's Office: 2040 Urey Hall Addition  
Revelle College  
(619) 534-3575

Student Affairs: 1001 Urey Hall  
Revelle College  
(619) 534-6870

#### Professors

William S. Allison, Ph.D.  
James R. Arnold, Ph.D.  
Marjorie C. Caserio, Ph.D., *Vice Chancellor, Academic Affairs*  
Leigh B. Clark, Ph.D.  
Edward A. Dennis, Ph.D.  
Russell F. Doolittle, Ph.D.  
Robert C. Fahey, Ph.D.  
Murray Goodman, Ph.D.  
Elvin Harper, Ph.D.  
David N. Hendrickson, Ph.D.  
Martin D. Kamen, Ph.D., *Professor Emeritus*  
David R. Kearns, Ph.D., *Professor Emeritus*  
Joseph Kraut, Ph.D.  
Jack Kyte, Ph.D.  
Katja Lindenberg, Ph.D., *Chair*  
Douglas Magde, Ph.D.  
Kurt Marti, Ph.D.  
Trevor C. McMorris, Ph.D.  
Stanley L. Miller, Ph.D.  
Xuong Nguyen-Huu, Ph.D.  
K.C. Nicolaou, Ph.D.  
Hans Oesterreicher, Ph.D.  
Charles L. Perrin, Ph.D.  
Gerhard N. Schrauzer, Ph.D.  
Kurt E. Shuler, Ph.D., *Professor Emeritus*  
John D. Simon, Ph.D.  
Hans E. Suess, Ph.D., *Professor Emeritus*  
Susan Taylor, Ph.D.  
Mark Thiemens, Ph.D.  
T. Don Tilley, Ph.D.  
Teddy G. Traylor, Ph.D., *Professor Emeritus*  
William C. Trogler, Ph.D.  
Roger Y. Tsien, Ph.D.

Regitze R. Vold, Ph.D.  
Robert L. Vold, Ph.D.  
Joseph W. Watson, Ph.D., *Vice Chancellor, Student Affairs*  
John H. Weare, Ph.D.  
Ernest Wenkert, Ph.D.  
John C. Wheeler, Ph.D.  
Kent R. Wilson, Ph.D.  
Bruno H. Zimm, Ph.D., *Professor Emeritus*

#### Associate Professors

F. Thomas Bond, Ph.D., *Provost, Revelle College*  
Daniel J. Donoghue, Ph.D.

#### Assistant Professors

Adrienne Brian, Ph.D.  
John E. Crowell, Ph.D.  
Daniel F. Harvey, Ph.D.  
Elizabeth A. Komives, Ph.D.  
Andrew C. Kummel, Ph.D.  
Joseph O'Connor, Ph.D.  
David A. Roise, Ph.D.  
Michael J. Sailor, Ph.D.  
Jay Siegel, Ph.D.

#### Adjunct Professors

Robert W. Holley, Ph.D.  
Frank M. Huennekens, Ph.D.  
Leslie E. Orgel, Ph.D.

## INTRODUCTION

The UCSD Department of Chemistry was founded in the 1950s by the late Professor Harold Urey and a group of colleagues who strove to create a department that would stress the fundamentals of chemistry and, at the same time, embrace diverse applications of those principles at the frontiers of knowledge.

The department is organized into two divisions: the Division of Biochemistry and the Division of Chemistry.

Degrees offered include:

#### Division of Biochemistry

B.A. Chemistry/Biochemistry  
B.S. Chemistry/Biochemistry  
M.S. Chemistry  
Ph.D. Chemistry

#### Division of Chemistry

B.A. Chemistry  
B.S. Chemistry  
B.S. Chemistry/Chemical Physics  
B.S. Chemistry/Earth Sciences  
B.S. Chemistry/Chemical Education  
M.S. Chemistry  
Ph.D. Chemistry

(The department normally does not accept students who desire a terminal M.S. degree.)



## CHEMISTRY-PREMEDICAL MAJORS

Either a chemistry/biochemistry major or a chemistry major with appropriate choice of electives provides a strong background for students intending to pursue careers in the medical sciences. Premedical students are encouraged to complete the three-quarter 141 organic sequence in their sophomore year. Most medical schools require a full year of organic chemistry. Biology 1 is strongly recommended, along with certain upper-division biology courses, which can be counted toward the major requirements in chemistry.

## GENERAL CHEMISTRY

Chem. 11, 12, 13 is a terminal sequence for non-science/non-engineering majors. The Chemistry 6 sequence (6A-6B-6C) is intended for science and engineering majors as well as others who need a quantitative course. It satisfies all preprofessional programs. Chem. 4 is a one-quarter preparation for 6A which should be taken only by those whose college adviser so recommends. The Chemistry Honors sequence (7A-7B) is designed for science and engineering majors with strong preparation in science and mathematics who can work at a very rapid pace and complete the introductory curriculum in two quarters. A student intending to major in chemistry can thus begin with 4, 6A or 7A, depending on the level of preparation. A student intending to major in a discipline other than chemistry should consult his or her adviser in the appropriate department to determine which chemistry sequence is recommended.

## UNDERGRADUATE MAJOR PROGRAMS

### LOWER-DIVISION REQUIREMENTS FOR BOTH DIVISIONS

The following courses must be taken for a letter grade:

1. General Chemistry (Chem. 6A-B-C or Chem. 7A-B) including laboratory (Chem. 6BL-CL) or equivalent.
2. Phys. 2A-B-D (Phys. 1A-B-C is also acceptable) for B.A. and Phys. 2A-B-C-D for B.S. Two units of physics laboratory. Phys. 2CL is recommended. (Phys. 2AL and 2DL are acceptable.) Phys 2CL is accessible without Phys. 2C.

3. Calculus through Math. 2D (differential equations), either Math. 2A-2D or Math. 1A, 1B, 1C, 2C (two units), 2D.

4. Chemical physics has additional lower-division requirements. See below.

5. Recommended, but not currently required: Math. 2E and a course in computer programming.

### UPPER-DIVISION REQUIREMENTS

The minimum passing grade is a D, and a minimum of a 2.0 average in the major is required for the degree. Except for independent research (Chem. 199) and Chemistry Instruction (Chem. 195), majors may not take chemistry courses on a P/NP basis. Chem. 195 and Chem. 199 must be taken on a P/NP basis.

Transfer students must pass at least twenty-four units of upper-division courses required for the major while officially enrolled at UCSD.

## DIVISION OF BIOCHEMISTRY CHEMISTRY/BIOCHEMISTRY MAJOR

The following program is designed for biochemistry and premedical students desiring a strong background in chemistry. The core biochemistry offering is a sequence of three quarters of lecture plus one laboratory in the junior year. This is followed by four advanced biochemistry courses in the senior year. These four latter courses may be substituted by certain courses in biology and chemistry.

The complete upper-division requirements are:

1. Two quarters of physical chemistry (Chem. 126, 127 recommended; 131, 132 acceptable).
2. Three quarters of organic chemistry (normally Chem. 141A-B-C).
3. One quarter of inorganic chemistry (Chem. 120A).
4. Three quarters of biochemistry (Chem. 114A-B-C).
5. Five laboratory courses (Chem. 143AM-B, 105A, either 112A or 112B and one additional lab).
6. Two elective courses from the following list: Chem. 112B, 113, 116, 117, 121, 122, 147.
7. One additional elective course chosen from among all of the upper-division and graduate courses offered by the Department of Chemistry or from the following list of courses offered by the Department of Biology: Biol. 108, 111, 113,

114, 131, 141, 143, 151, 153, 156. Other electives may be arranged by petition.

8. For the B.S. degree two additional chemistry electives are required. Chem. 199 may be used for one of these electives for the B.S. but not for the B.A. Chem. 195 may not be used for these electives.

Any departure from these requirements must be approved by petition. The following schedule is only an example.

### SUGGESTED PROGRAM FOR CHEMISTRY/BIOCHEMISTRY B.S. MAJOR:

FALL	WINTER	SPRING
<b>FRESHMAN YEAR</b>		
Chem. 6A	Chem. 6B Chem. 6BL	Chem. 6C Chem. 6CL
Math. 2A	Math. 2B	Math. 2C
<b>SOPHOMORE YEAR</b>		
Chem. 141A Chem. 143AM Math. 2D Phys. 2A	Chem. 141B Chem. 143B Phys. 2B	Chem. 141C Biol. 1* Phys. 2C*** Phys. 2CL
<b>JUNIOR YEAR</b>		
Chem. 114A Chem. 126 Phys. 2D	Chem. 114B Chem. 127 Chem. 112A**	Chem. 114C Chem. 105A Elective***
<b>SENIOR YEAR</b>		
Chem. 120A Elective	Elective Lab Elective	Elective*** Elective

\*Recommended, but not required.

\*\*or 112B in the spring.

\*\*\*Not required for the B.A.

## DIVISION OF CHEMISTRY CHEMISTRY MAJOR

The upper-division requirements for the chemistry major are:

1. One year of physical chemistry (130, 131, 132). The 126, 127, 128 sequence, although of comparable difficulty, is not intended for chemistry majors.
2. One year of organic chemistry (141A-B-C).
3. Two quarters of inorganic chemistry (120A, 120B).
4. One quarter of biochemistry (Chem. 114A).
5. Five laboratory courses (Chem. 143A-B, 105A and two of the following: Chem. 106, 112A, 123, 143C, or 105B).
6. Three additional four-unit upper-division or graduate courses in chemistry or related areas. At least two of these courses must be other than 195 or 199.
7. For B.S. degree two additional chemistry electives are required.

\*Phys. 2C is not required.



## CHEMISTRY

### SUGGESTED PROGRAM FOR CHEMISTRY B.S. MAJOR:

FALL	WINTER	SPRING
<b>FRESHMAN YEAR</b>		
Chem. 6A	Chem. 6B	Chem. 6C
	Chem. 6BL	Chem. 6CL
Math. 2A	Math. 2B	Math. 2C
<b>SOPHOMORE YEAR</b>		
Chem. 141A	Chem. 141B	Chem. 141C
Chem. 143AM	Chem. 143B	
Math. 2D	Phys. 2B	Phys. 2C*
Phys. 2A		Phys. 2CL
<b>JUNIOR YEAR</b>		
Phys. 2D	Chem. 131	Chem. 132
Chem. 120A	Chem. 120B	Elective Lab
Chem. 114A		
<b>SENIOR YEAR</b>		
Chem. 130	Elective Lab	Elective
Chem. 105A	Elective	Elective
Elective	Elective*	Elective*

\*Not required for the B.A.

### CHEMISTRY/CHEMICAL PHYSICS MAJOR

Chemical physics applies the concepts and quantitative methods of physics to the descriptions of atoms and molecules, analyzes matter as a statistical assembly of molecular building blocks, and develops and exploits physical (largely spectroscopic) experimental tools with which to test and refine such theories.

The chemistry/chemical physics major is designed as a preparation for graduate work. It requires completion of Phys. 2A-2D, Chem. 7A-7B or Chem. 6A-6C, and the Math. 2 sequence through 2F by the end of the sophomore year, along with the lower-division labs Chem. 6BL, 6CL, and Physics 2CL or equivalent. The upper-division requirements are the same as for the chemistry B.S. major, except: Chem. 141C is not required. Chem. 114A is not required, but can substitute for Chem. 120B. The five upper-division chemistry labs are: Chem. 105A, 106, 143A, 143C and one of 112A, 123, or 143B. Math. 110, and Phys. 110A, 110B or 100A, 100B, and Chem. 133 or 135 are required, plus one additional course in physical chemistry or related areas as approved by an adviser. This course may be Chem. 199.

### SUGGESTED PROGRAM FOR CHEMISTRY/CHEMICAL PHYSICS B.S. MAJOR:

FALL	WINTER	SPRING
<b>FRESHMAN YEAR</b>		
Chem. 6A	Chem. 6B	Chem. 6C
	Phys. 2A	Phys. 2B
	Chem. 6BL	Phys. 2CL
Math. 2A	Math. 2B	Math. 2C

#### SOPHOMORE YEAR

Chem. 141A	Chem. 141B	Chem. 143A
Math. 2D	Math. 2E	Math. 2F
Phys. 2C	Phys. 2D	
Chem. 6CL		

#### JUNIOR YEAR

Chem. 130	Chem. 131	Chem. 132
	Chem. 105A	Chem. 143C
Phys. 110A	Phys. 110B	Math. 110
or Phys. 100A	or Phys. 100B	
or Chem. 120A	or Chem. 120B	

#### SENIOR YEAR

Chem. 120A	Chem. 120B*	Chem. 135
or Phys. 110A	or Phys. 110B	
or Phys. 100A	or Phys. 100B	
Elective Lab	Chem. 106	Elective

\*Chem. 114A (fall quarter) may be substituted.

### CHEMISTRY/EARTH SCIENCES MAJOR

A chemistry major with specialization in earth sciences is also available for undergraduates. See "Earth Sciences" for description of this program, which may be arranged by consultation with advisers in the Department of Chemistry and Scripps Institution of Oceanography.

The required upper-division chemistry courses are: Chem. 141A, 141B; Chem. 130, 131, 132; Chem. 120A; Chem. 114A or Chem. 120B. The five upper-division labs are: 105A, 106, 143A, SIO 256L and one of 105B, 123, or 143C. The specifically required earth sciences courses are: ES 101, Introduction to Earth Sciences; ES 103, Introduction to Geophysics; ES 102, Introduction to Geochemistry; ES 120, Mineralogy; and SIO 256A, Field Geology. At least two other courses from the following list are required: SIO 244, 245A, 245B, 253, Chem. 170, 171, 272. Petrology (SIO 253) is essential for geology students. SIO 253 and 245A should be taken by students planning to go on to graduate school or to do professional geologic work with their undergraduate degrees. Students are encouraged to take at least one quarter of Chem. 199. The courses should be taken in the order given in the suggested program.

### SUGGESTED PROGRAM FOR CHEMISTRY/EARTH SCIENCES B.S. MAJOR:

FALL	WINTER	SPRING
<b>FRESHMAN YEAR</b>		
Chem. 6A	Chem. 6B	Chem. 6C
	Chem. 6BL	Chem. 6CL
Math. 2A	Math. 2B	Math. 2C
<b>SOPHOMORE YEAR</b>		
Chem. 141A	Chem. 141B	Chem. 143A
Math. 2D	Phys. 2A	Phys. 2B
		Phys. 2CL

#### JUNIOR YEAR

E.S. 101	E.S. 103	E.S. 102
Phys. 2D	Chem. 131	Chem. 132
Chem. 120A	Chem. 120B*	Chem. 105A

#### SENIOR YEAR

Chem. 130	Chem. 106	Elective
E.S. 120	SIO 256A	Elective Lab
Elective	SIO 256L	

\*Chem. 114A (fall quarter) may be substituted.

### CHEMISTRY/CHEMICAL EDUCATION MAJOR

The chemistry program offers an excellent preparation for teaching physical science in secondary schools, including chemistry, physics, earth science, biology, and mathematics. The chemistry/chemical education program is expected to have American Chemical Society accreditation.

The chemistry/chemical education program is sufficiently intensive that students with this degree should be admissible as graduate students to most universities.

The program is basically a chemistry major with earth science and biochemistry as electives combined with three courses in the Teacher Education Program.

If you are interested in earning a California teaching credential through UCSD, contact the Teacher Education Program for information about the prerequisite and professional preparation requirements. It is recommended that you contact TEP as early as possible in your academic career.

### LOWER-DIVISION REQUIREMENTS FOR CHEMISTRY/CHEMICAL EDUCATION MAJOR

The following courses must be taken for a letter grade:

1. General Chemistry (Chem. 6A-B-C or Chem. 7A-B) including laboratory (Chem. 6BL-CL) or equivalent.
2. Physics 2A-B-C (2D can substitute for 2C). Two units of physics laboratory. Physics 2CL is recommended. (Physics 2AL and 2DL are acceptable.) Physics 2CL is accessible without Physics 2C.
3. Math. 2A-B-C.
4. Biol. 1.
5. A course in computer programming is recommended.

## UPPER-DIVISION REQUIREMENTS

1. Two quarters of physical chemistry (Chem. 126-127 recommended; 131-132 acceptable).
2. Three quarters of organic chemistry (normally 141A-B-C).
3. One quarter of inorganic chemistry (Chem. 120A).
4. One quarter of biochemistry (Chem. 114A).
5. Five laboratory courses (Chem. 143AM, 143B, 105A, and two of 112A, 112B, 105B, 106, or 123).
6. One chemistry elective course.
7. Two earth science courses, ES 101 and ES 102 or 103. (Other biology or chemistry course may be arranged by petition.)
8. Chem. 195.
9. Chem. 199 or Chem. 196.
10. TEP 117A-B-C.

## SUGGESTED PROGRAM FOR CHEMISTRY/CHEMICAL EDUCATION B.S. MAJOR:

FALL	WINTER	SPRING
<b>FRESHMAN YEAR</b>		
Chem. 6A	Chem. 6B	Chem. 6C
	Chem. 6BL	Chem. 6CL
Math. 2A	Math. 2B	Math. 2C
<b>SOPHOMORE YEAR</b>		
Chem. 141A	Chem. 141B	Chem. 141C
Chem. 143AM	Chem. 143B	Biol. 1
Phys. 2A	Phys. 2B	Phys. 2C
		Phys. 2CL
<b>JUNIOR YEAR</b>		
Chem. 126	Chem. 127	Chem. 195
Chem. 114A	Elective Lab	
Earth Sci. 101		Earth Sci. 102
<b>SENIOR YEAR</b>		
Chem. 120A	Chem. 105A	Elective Lab
Chem. Elective	Chem. 199 or 196	
TEP 171A	TEP 171B	TEP 171C

## HONORS PROGRAM

The Department of Chemistry offers an Honors Program to those students who have demonstrated excellence in any of the four majors. Students are eligible for admission to the program when they have:

1. Completed ninety units of courses, including twenty-two units of chemistry courses.
2. Achieved a GPA of 3.2 overall and 3.4 in chemistry courses.
3. Submitted an honors thesis research proposal to the faculty committee in charge and obtained approval for that thesis topic.

Successful completion of the Honors Program requires:

1. Maintenance of a GPA of 3.2 overall and 3.4 in chemistry.
2. Registration for a minimum of eight units of chemistry 199, distributed over at least two quarters. These units must be in addition to the ordinary major requirements. However, a student who registers for 199 and subsequently fails to complete the Honors Program may apply up to four units to any major that normally allows 199 as elective credit.
3. Acceptance of a written honors thesis report by a committee of not fewer than three faculty.
4. Presentation of an oral report on the thesis research, preferably at a public undergraduate research conference on this campus or at a chemistry conference off-campus, or, lacking that opportunity, at a seminar involving the honors students and three faculty.

Students who are interested in the Honors Program should contact Debbie O'Hagan, 1001 Urey Hall, and are invited to do so at any time, even well before completing ninety units.

## MINOR PROGRAMS IN CHEMISTRY

A typical minor in chemistry consists of three lower-division courses, such as Chem. 6A-B-C, followed by a sequence of three upper-division courses focused in physical, inorganic, organic, or environmental chemistry or biochemistry. Courses required by a student's major may not be applied toward a minor. Courses for the minor may be taken on a Pass/Not Pass basis if the student's college permits. The Warren College program of concentration is similar, but not identical, to a minor.

## OFFICE CONTACT

The departmental Student Affairs Office is located in 1001 Urey Hall. Majors and prospective majors are encouraged to contact this office.

## THE GRADUATE PROGRAM

The department accepts students for study toward the Ph.D. in either the Division of Chemistry or the Division of Biochemistry. The doctoral program is designed to encourage initiative on the part of the student and to develop habits of independent study. Students with normal preparation start research early.

There are some small differences between the Divisions of Chemistry and Biochemistry. Such details, along with comprehensive descriptions

of research activities in both divisions, can be found in the Department of Chemistry's graduate brochure.

Students whose native language is not English must submit TOEFL scores. A student must demonstrate a mastery of English adequate to permit him or her to satisfy the teaching requirement. A foreign student must remedy any deficiency by the end of the first year of residency. There is no foreign language requirement, but it is recommended that a student acquire at least a reading knowledge of one foreign language, preferably German or Russian.

In order that they may participate effectively in this program, entering graduate students will be required to have a mastery of the subjects usually presented in an undergraduate chemistry curriculum. So that students may be properly advised, their mastery of these undergraduate subjects will be tested by written examination on their arrival. Deficiencies in undergraduate preparation must be remedied during the first year of graduate study.

In the first year the student will usually take at least six of the graduate courses listed below, plus Chem. 250, which is required. The student may also take upper-division undergraduate courses. Depending on the student's special interests, he or she may take courses in other departments. Students enrolled in the Ph.D. program are expected to select a research adviser during their first year. In the second year the student will usually carry a lighter load of formal courses, but will continue to participate in seminars and informal study groups.

In the winter quarter of the second year, there is an oral departmental exam covering an area of current research interest. This exam, along with the course work, will usually qualify the student for receipt of the M.S. degree. The oral qualifying exam covering the student's Ph.D. thesis project is taken before the end of the third year. Successfully passing the oral qualifying examination advances the student to candidacy for the Ph.D. The candidate then devotes most of his or her time to thesis research and study. A final examination is conducted by the student's doctoral committee upon completion of the dissertation. The examination is oral and deals with the dissertation and its relation to the general field of study.

All graduate students are required to participate in the graduate teaching program as a part of their educational experience. Course credit is obtained for this teaching by registration in Chem. 500.

The interdisciplinary tradition is strong on the San Diego campus. The chemistry faculty has close ties with the Departments of Applied Me-

chanics and Engineering Sciences, Biology and Physics, as well as with the Scripps Institution of Oceanography and the School of Medicine. Facilities are thus available to the graduate student for study or collaboration in a wide variety of interdisciplinary fields.

### DEPARTMENTAL PH.D. TIME LIMIT POLICIES

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed six and one-third years. Total registered time at UCSD cannot exceed seven and one-third years.

### JOINT DOCTORAL PROGRAM WITH SAN DIEGO STATE UNIVERSITY

The Department of Chemistry at UCSD cooperates with the Department of Chemistry in the Division of the Physical Sciences, San Diego State University, in offering a joint program of graduate study leading to the Ph.D. degree in chemistry.

Information regarding admission is found in the current edition of the *Bulletin of the Graduate Division* of San Diego State University. Requirements for the Ph.D. are the same as those above except that only one quarter of teaching is required during the first year of residence at UCSD.

## Courses

### LOWER DIVISION

#### 4. Basic Chemistry (4)

Chemistry 4 is a one-quarter course for science majors with insufficient preparation to start the Chem. 6 sequence. Emphasis is on learning how to solve quantitative problems. Topics include nomenclature, stoichiometry, and the periodic table. Cannot be taken for credit after any other chemistry course. Includes a combined laboratory and discussion-recitation each week. *Prerequisite: Math. 4C or Math. 1A (may be taken concurrently).* (F,W)

#### 6A. General Chemistry (4)

First quarter of a three-quarter sequence intended for science and engineering majors. Topics include: stoichiometry, gas laws, bonding, atomic theory, quantum theory, and thermochemistry. Three hours' lecture, one hour recitation. *Prerequisite: proficiency in high school chemistry or physics and in high school mathematics; Math. 4C or equivalent.* (F,W,S)

#### 6B. General Chemistry (4)

Second quarter of a three-quarter sequence intended for science and engineering majors. Topics include: molecular geometry, condensed phases and solutions, chemical equilibrium, acids and bases and thermodynamics. Three hours' lecture, one hour recitation. *Prerequisites: Chem. 6A; Math. 2A or 1A.* (F,W,S)

#### 6BL. General Chemistry Laboratory (2)

Introduction to experimental procedures used in synthetic, analytical, and physical chemistry. If 6BL is a requirement for your major, it should be taken concurrently with 7A, 6B, or 6C. Formerly Chem. 8AL. (F,W,S)

#### 6C. General Chemistry (4)

Third quarter of a three-quarter sequence intended for science and engineering majors. Topics include: electrochemistry, kinetics, coordination chemistry, nuclear chemistry, and an introduction to organic and biochemistry. Three hours' lecture, one hour recitation. *Prerequisite: Chem. 6B; Chem. 6BL may be taken concurrently.* (F,W,S)

#### 6CL. Introductory Analytical Chemistry (3)

A laboratory course with emphasis on safe, accurate, and precise experimental techniques in chemistry, including quantitative analysis and instrumental methods, usually taken concurrently with Chem. 6C, but required for only certain majors. Formerly Chem. 8BL. *Prerequisite: Chem. 6BL.* (F,S)

#### 7A. Honors Chemistry (4)

First quarter of a two-quarter honors sequence, for science and engineering majors with strong preparation in mathematics and science. Topics include: models for the behavior of gases, liquids and solids, principles of thermodynamics and chemical equilibrium, and representative applications. *Prerequisites: Math. 2A (may be taken concurrently) and strong high school chemistry and physics. Concurrent registration in Chem. 6BL is recommended.* (F)

#### 7B. Honors Chemistry (4)

Second quarter of the honors sequence, for science and engineering majors with strong preparation in mathematics and science. Topics include: principles of chemical bonding, with representative application, rates and mechanisms of chemical reactions, and comparisons between theoretical and experimental approaches to solving chemical problems. *Prerequisites: Chem. 7A and Math. 2B (may be taken concurrently).* (W)

#### 11. The Periodic Table (4)

Introduction to the material world of atoms and small inorganic molecules. Intended for nonscience majors. Can be skipped by students with good knowledge of high school chemistry. Cannot be taken for credit after any other chemistry course. (F,W)

#### 12. Molecules and Reactions (4)

Introduction to molecular bonding and structure and chemical reactions, including organic molecules and synthetic polymers. Intended for nonscience majors. *Prerequisite: Chem. 11 or good knowledge of high school chemistry.* (W)

#### 13. Chemistry of Life (4)

Introduction to biochemistry for nonscience majors. *Prerequisite: Chem. 12.* (S)

#### 90. Undergraduate Seminar (1)

A seminar intended for exposing undergraduate students, especially freshmen and sophomores, to exciting research programs conducted by the faculty. Enrollment is limited.

### UPPER DIVISION

#### 102A. Thermodynamics (4)

Thermodynamics of chemical systems, the three laws, with emphasis on the formal structure of thermodynamics. Chemical equilibrium, stability theory, heterogeneous equilibrium. Solutions. Intended as a preparation for Chem. 204A. *Prerequisites: Chem. 131, 132, or equivalent.* (F)

#### 105A. Physical Chemistry Laboratory (3)

Laboratory course in experimental physical chemistry. *Prerequisites: Chem. 6CL and Phys. 1CL or equivalent, Chem. 130 or 131 or 126 or 127.* (F,W,S)

#### 105B. Physical Chemistry Laboratory (2)

Laboratory course in experimental physical chemistry. *Prerequisites: Chem. 105A and 130.* (F,W,S)

#### 106. Instrumental Analysis Laboratory (4)

Instrumental methods for analytical chemistry emphasizing physical principles underlying both the instruments and the analytical methods. *Prerequisite: Chem. 105A.* (W)

#### 107. Synthetic Macromolecules (4)

The organic and physical chemistry of high polymers with emphasis on synthesis, structure, characterization, and properties. Polymers as materials are important as films, fibers, and elastomers. They play an ever-increasing role in science, technology, and medicine. *Prerequisites: Chem. 126 or 131 and 140B or 141B.* (W)

#### 112A. Molecular Biochemistry Laboratory (4)

The application of techniques, including electrophoresis, peptide mapping and sequencing, affinity chromatography, amino acid analysis, gas-liquid chromatography, and enzyme functions and the chemistry of lipids, carbohydrates, and nucleic acids. *Prerequisites: Chem. 141A-B-C, 143A-B, 114A-B. (Some of these courses may be taken concurrently.)* (NOTE: Students may not receive credit for both Chem. 112A and Biology 103.) (W)

#### 112B. Molecular Biochemistry Laboratory (4)

This laboratory will introduce the students to the tools of molecular biology and will involve experiments with recombinant DNA techniques. *Prerequisites: Chem. 114A-B, Chem. 114C (may be taken concurrently); Chem. 143A and 143B.* (S)

#### 113. Chemistry of Biological Macromolecules (4)

A discussion of the structural principles governing biological macromolecules, the techniques used in their study, and how their functional properties depend on three-dimensional structure. *Prerequisites: elementary organic and physical chemistry.* (S)

#### 114A. Biochemical Structure and Function (4)

Introduction to biochemistry from a structural and functional viewpoint. *Prerequisite: elementary organic chemistry (which may be taken concurrently).* (F)

#### 114B. Biochemical Energetics and Metabolism (4)

This course is an introduction to the metabolic reactions in the cell which produce and utilize energy. The course material will include energy-producing pathways: glycolysis, Krebs cycle, oxidative phosphorylation, fatty-acid oxidation. Biosynthesis—amino acids, lipids, carbohydrates, purines, pyrimidines, proteins, nucleic acids. *Prerequisite: Chem. 114A.* (NOTE: Students may not receive credit for both Chem. 114B and Biology 101.) (W)

#### 114C. Biosynthesis of Macromolecules (4)

This course is a continuation of the introduction to biochemistry courses (114A and 114B). This quarter reviews the mechanisms of biosynthesis of macromolecules—particularly proteins and nucleic acids. Emphasis will be placed on how these processes are controlled and integrated with the metabolism of the cell. *Prerequisite: Chem. 114B.* (NOTE: Students may not receive credit for both Chem. 114C and Biology 106.) (S)

#### 116. Chemistry of Enzyme Catalyzed Reactions (4)

A discussion of the chemistry of representative enzyme catalyzed reactions is presented. Enzyme reaction mechanisms and their relation to enzyme structure are emphasized. *Prerequisites: elementary physical chemistry, organic chemistry, and biochemistry.* (W)

#### 117. Biochemistry of Human Disease (4)

An advanced course in biochemistry which will deal primarily with the molecular basis of human disorders. *Prerequisite: elementary biochemistry.* (W)

**120A. Inorganic Chemistry (4)**

The chemistry of the main group elements is presented in terms of atomic structure, ionic and covalent bonding. Structural theory involving s, p, and unfilled d orbitals is described. Thermodynamic and spectroscopic criteria for structure and stability of compounds are presented and chemical reactions of main group elements discussed in terms of molecular structure and reactivity. *Prerequisites: a general chemistry course. Chem 141A or equivalent course is recommended.* (F)

**120B. Inorganic Chemistry (4)**

A continuation of the discussion of structure, bonding, and reactivity with emphasis on transition metals and other elements using filled d orbitals to form bonds. Coordination chemistry is discussed in terms of valence bond, crystal field, and molecular orbital theory. The properties and reactivities of transition metal complexes including organometallic compounds are discussed. *Prerequisite: Chem. 120A.* (W)

**120C. Inorganic Chemistry (4)**

The reactivity of molecules is examined from a kinetic and mechanistic point of view. Properties affecting reactivity are examined and case studies of reactions are discussed in detail. *Prerequisite: Chem. 120B or consent of instructor.* (S)

**121. Energy Transduction (4)**

Discussion of current understanding of mechanisms of muscle contractions, photosynthesis, bioluminescence, chemiluminescence, and active transport will be presented. *Prerequisites: organic chemistry and introductory biochemistry.* (S)

**122. Biochemical Evolution (4)**

This course emphasizes the chemical aspects of evolution, including the origin of living systems on earth, primitive energy acquisition devices, the coupling of information storage and replication catalysis, protein evolution, and the biochemical unity and diversity of extant organisms. *Prerequisites: organic chemistry and introductory biochemistry.* (W)

**123. Inorganic Chemistry Laboratory (4)**

Synthesis, analysis, and physical characterization of inorganic chemical compounds. *Prerequisite: Chem. 120A or 143B; Chem. 120B recommended.*

**126. Physical Chemistry (4)**

Thermodynamics, first and second laws, thermochemistry, chemical equilibrium, phase equilibrium, solutions. *Prerequisites: Chem. 7B or Chem. 6C, Math. 2C or consent of instructor.* (NOTE: Students may not receive credit for both 126 and 131.)

**127. Physical Chemistry (4)**

Electrochemistry, kinetic theory, quantum theory, and reaction kinetics. *Prerequisites: Chem. 7B or Chem. 6C, Math. 2C and 2D, Chem. 126 or consent of instructor.* (NOTE: Students may not receive credit for both 127 and 132.) (W)

**128. Physical Chemistry (4)**

Statistical mechanics, atomic and molecular structure, spectroscopy, solids, x-ray diffraction. *Prerequisites: Chem. 7B or Chem. 6C, Math. 2C and 2D, Chem. 127, or consent of instructor.* (S)

**130. Physical Chemistry (4)**

Quantum mechanics, atomic and molecular spectroscopy, molecular structure. *Prerequisites: Chem. 7B or Chem. 6C, Math. 2C and 2D, Phys. 2D or equivalent, or consent of instructor.* (F)

**131. Physical Chemistry (4)**

Thermodynamics, chemical equilibrium, phase equilibrium, chemistry of solutions. *Prerequisites: Chem. 7B or Chem. 6C, Math. 2C, 2D, or consent of instructor.* (NOTE: Students may not receive credit for both 126 and 131.) (W)

**132. Physical Chemistry (4)**

Chemical statistics, kinetic theory, reaction kinetics. *Prerequisites: Chem. 7B or Chem. 6C, Math. 2C, 2D, Chem. 131, or*

*consent of instructor.* (NOTE: Students may not receive credit for both 127 and 132.) (S)

**133. Elementary Statistical Thermodynamics (4)**

Equilibrium, distribution functions, development of partition functions; derivation of thermodynamic properties of simple systems from partition functions. *Prerequisites: Chem. 130, 131, 132, Math. 2D.* (W)

**134. Computer Programming in Chemistry (4)**

Use of computer programming in the analysis and presentation of chemical data (statistical analysis, least squares fitting procedures, titration curve interpretation, analysis of radioactive decay series, chemical kinetics, organic synthesis, etc.) *Prerequisites: Math. 2A and 2B or equivalent.* (NOTE: Students may receive credit for only one of the following: Biology 181, Chemistry 134.) (W)

**135. Spectroscopy and Structure (4)**

The interaction of electromagnetic radiation with molecules and bulk matter, x-ray and optical scattering; electronic, vibrational and rotational spectroscopy; nuclear and electron magnetic resonance. Emphasis will be placed on the quantum mechanical interpretation of experimental data. *Prerequisite: Chem. 130.* (S)

**140A. Organic Chemistry (4)**

An introduction to organic chemistry, with emphasis on material fundamental to biochemistry. Topics include bonding theory, isomerism, stereochemistry, chemical and physical properties, and an introduction to substitution, addition, and elimination reactions. *Prerequisite: Chem. 6C or 7B or equivalent course in general chemistry.* (NOTE: Students may not receive credit for both 140A and 141A.) (F,W)

**140B. Organic Chemistry (4)**

A continuation of 140A; acid/base reactions, chemistry of the carbonyl group, sugars, peptides, nucleic acids and other natural products. *Prerequisite: Chem. 140A (a grade of C or higher in Chem. 140A is strongly recommended).* (NOTE: Students may not receive credit for both 140B and 141B.) (W,S)

**140C. Organic Chemistry (4)**

A continuation of Chemistry 140A-B. Organic chemistry of biologically important molecules: carbohydrates, proteins, fatty acids, biopolymers, natural products, drugs; models for enzymatic reactions, synthetic methods, and methods of analysis. *Prerequisite: Chem. 140B.* (F,S)

**141A. Organic Chemistry (4)**

Chem. 141A introduces theoretical and experimental studies of structure and properties of covalent molecules. Both resonance and simple molecular orbital descriptions of organic compounds are introduced and spectroscopic methods for determining electronic and molecular structure are discussed. Organic reactions are introduced with synthetic and mechanistic examples. *Prerequisites: Chem. 7B or 6C (6C may be taken concurrently by good students). Prior or concurrent physics recommended.* (F)

**141B. Organic Chemistry (4)**

A continuation of 141A, this course applies the structure-reactivity, spectroscopy, and electronic theories introduced in 141A to organic reactions. *Prerequisite: Chem. 141A.* (W)

**141C. Organic Chemistry (4)**

A continuation of 141A-B, this course treats selected topics such as carbon-metal bonds, organometallic chemistry, electrophilic reactions, free radical reactions, alkane chemistry, polymerization, molecular orbital theory and electrocyclic reactions, photochemistry, unstable intermediates such as carbenes, benzyne, etc., and metal oxidation reactions, and an introduction to carbohydrate and protein chemistry. *Prerequisite: Chem. 141B.* (S)

**142. Natural Products Chemistry (4)**

An outline of the chemistry of terpenes, steroids, alkaloids, and plant phenols developed on the basis of modern biogenetic theory. Special emphasis will be given to biologically active substances such as hormones and antibiotics. *Prerequisites: Chem. 140A-B-C, or 141A-B-C.* (Not offered every year.)

**143A. Organic Chemistry Laboratory (2)**

Introduction to laboratory techniques needed in organic chemistry. Stresses physical methods including separation and purification, spectroscopy, product analysis and effects of reaction conditions. *Prerequisites: Chem. 6BL, Chem. 141A or Chem. 140A (may be taken concurrently).* (F,W,S)

**143AM. Majors Organic Chemistry Laboratory (2)**

An organic chemistry laboratory intended for chemistry majors. It is similar to Chem. 143A, but with emphasis on instrumental methods of product identification, separation, and analysis. *Prerequisites: Chem. 6BL; Chem. 141A is to be taken concurrently.* (F)

**143B. Organic Chemistry Laboratory (4)**

Continuation of 143A, emphasizing synthetic methods of organic chemistry. *Prerequisites: Chem. 143A; 141B or 140B (may be taken concurrently).* (W)

**143C. Organic Laboratory (4)**

Identification of unknown organic compounds by a combination of chemical and physical techniques. *Prerequisites: Chem. 6CL, 143A, 141C (may be taken concurrently); 143B suggested.* (S)

**147. Mechanisms of Organic Reactions (4)**

A qualitative approach to the mechanisms of various organic reactions; substitutions, additions, eliminations, condensations, rearrangements, oxidations, reductions, free-radical reactions, and photochemistry. Includes considerations of molecular structure and reactivity, synthetic methods, spectroscopic tools, and stereochemistry. The topics emphasized will vary from year to year. This is the first quarter of the advanced organic chemistry sequence. *Prerequisite: Chem. 141C or 140C.* (F)

**148. Synthetic Methods in Organic Chemistry (4)**

A survey of reactions of particular utility in the organic laboratory. Emphasis is on methods of preparation of carbon-carbon bonds and oxidation reduction sequences. *Prerequisite: Chem. 141C or consent of instructor.* (Not offered every year.)

**149A. Environmental Chemistry (4)**

The chemical basis of air and water pollution, solid waste disposal, energy and mineral resource usage, agricultural productivity and biological toxicity. *Prerequisite: introductory chemistry.* (F) (Not offered every year.)

**167. Biochemistry of Lipid Diseases (4)**

The central theme of this course will be to develop a broad understanding of the basic biochemical aspects of lipid metabolism, the regulation of lipid metabolism and application to the treatment of specific human diseases. *Prerequisite: biochemistry.* (Not offered every year.)

**170. Cosmochemistry (4)**

Composition of stars, of planets, of meteorites, and the earth and moon. Nuclear stability rules and isotopic composition of the elements. Chemical properties of solar matter. Origin of the elements and of the solar system. *Prerequisite: general chemistry sequence.*

**171. Nuclear and Radiochemistry (4)**

Radioactive decay, stability systematics, neutron activation, nuclear reactions. Szilard-Chalmers reactions, hot-atom chemistry, radiation chemistry, effects of ionizing radiation. *Prerequisite: general chemistry sequence.*

**173. Atmospheric Chemistry (4)**

Chemical principles applied to the study of atmospheres. Atmospheric photochemistry, radical reactions, chemical lifetime determinations, acid rain, greenhouse effects, ozone cycle, and



evolution are discussed. *Prerequisites: Chem. 6A-6C.* (Not offered every year.)

**190. Mathematical Methods of Chemistry (4)**

Applied mathematics useful for kinetics, thermodynamics, statistical mechanics and quantum mechanics. Topics include ordinary and partial differential equations, special functions, probability and statistics, vector functions and operators, linear algebra, and group theory. *Prerequisites: general chemistry, one year of calculus.* (Not offered every year.)

**195. Methods of Teaching Chemistry (4)**

An introduction to teaching chemistry. Students are required to attend a weekly class on methods of teaching chemistry, and will teach a discussion section of one of the lower-division chemistry courses. Attendance at lecture of the lower-division course in which the student is participating is required. (P/NP grades only.) *Prerequisite: consent of instructor.* (F,W,S)

**196. Senior Reading and Research in Chemical Education (2 or 4)**

Independent literature or classroom research by arrangement with, and under the direction of, a member of the Department of Chemistry faculty. Students must register on a P/NP basis. *Prerequisite: consent of instructor and department.*

**199. Senior Reading and Research (2 or 4)**

Independent literature or laboratory research by arrangement with, and under the direction of, a member of the Department of Chemistry faculty. Students must register on a P/NP basis. *Prerequisite: consent of instructor and department.* (F,W,S)

GRADUATE

**200A-B. Molecular Quantum Mechanics (4-4)**

The fundamental concepts and techniques of quantum mechanics which are useful for problems of chemical interest are developed and applied to the structure, spectra, and properties of molecules. *Prerequisite: an introduction to quantum mechanics as in a physical chemistry course, for example, Chem. 130. A good background in mathematics is helpful, for example, Chem. 190.* (F,W; not offered every year.)

**202A. Thermodynamics (4)**

Thermodynamics of chemical systems; the three laws, with emphasis on the formal structure of thermodynamics. Chemical equilibrium, stability theory, heterogeneous equilibrium, solutions. Intended as a preparation for Chem. 204A. *Prerequisites: Chem. 131, 132, or equivalent.* (F)

**204A. Statistical Mechanics of Chemical Systems (4)**

Equilibrium statistical mechanics, derivation of the formal ensemble equations and the laws of thermodynamics from the principles of classical and quantum mechanics, the relations between the different ensembles, the use of the equations for various chemical systems, gases, crystals, and liquids. *Prerequisite: Chem. 133 or equivalent, or consent of instructor.* (S)

**206. Topics in Biophysics and Physical Biochemistry (4)**

Selection of topics of current interest. Examples: primary processes of photosynthesis; membrane biophysics; applications of physical methods to problems in biology and chemistry, e.g., magnetic resonance, x-ray diffraction, fluctuation spectroscopy, optical techniques (fluorescence, optical rotary dispersion, circular dichroism). Topics may vary from year to year. *Prerequisite: consent of instructor.* (W)

**207. Modern NMR Methods (4)**

Treats varied pulse sequences, one- and two-dimensional methods, interpretation of relaxation rates, spin-decoupling, multiple quantum filtering, and solvent suppression with application to liquid crystals, membranes, small molecules, proteins, and nucleic acids.

**209. Special Topics in Chemical Physics (4)**

Topics of special interest will be presented. Examples include NMR, solid-state chemistry, phase transitions, stochastic processes, scattering theory, nonequilibrium processes, and advanced topics in statistical mechanics, thermodynamics, and chemical kinetics. (S/U grades permitted.)

**210. Seminar in Biochemistry (2)**

Seminars presented by graduate students which will explore topics in specialized areas of biochemistry and provide opportunities for students to gain experience in oral presentation of information from the literature. Each quarter a different topic is discussed. (Not offered every year.)

**211. Biochemistry (4)**

A comprehensive course in biochemistry emphasizing metabolic and human biochemistry. *Prerequisites: physical and organic chemistry; graduate-student standing.* (F)

**212. Biochemistry of Growth Regulation and Oncogenesis (4)**

An introduction to the biochemistry of growth regulation and oncogenesis. Topics include: tryptophan protein kinases; growth factor receptors; control of cell proliferation; transformation by papovaviruses and retroviruses. Designed for graduate students, but suitable for undergraduates with consent of instructor. *Prerequisite: biochemistry, molecular biology, or equivalent.*

**213. Chemistry of Macromolecules (4)**

A discussion of the structural principles governing biological macromolecules, the techniques used in their study, and how their functional properties depend on three-dimensional structure. *Prerequisites: elementary physical and organic chemistry.* (F)

**214. History of Biochemistry (2)**

A summary of the contributions which led to the major concepts in the field of biochemistry. Emphasis will be placed on the research approach taken by eminent individuals. *Prerequisite: Chem. 211.*

**215. Nutritional Biochemistry (2)**

The biochemical basis of human nutrition will be emphasized. *Prerequisites: Chem. 211, which may be taken concurrently; graduate-student standing.*

**216. Chemistry of Enzyme Catalyzed Reactions (4)**

A discussion of the chemistry of representative enzyme catalyzed reactions is presented. Enzyme reaction mechanisms and coenzyme chemistry are emphasized. *Prerequisite: organic chemistry.* (W)

**217. Immunology (3)**

Graduate students will explore topics in specialized areas of immunochemistry and cellular immunology, antigenic and molecular structure of immunoglobulin molecules; antigen-antibody interactions; cellular events in the humoral and cellular immune responses; translation immunology. *Prerequisite: consent of instructor.* (F)

**218. Biochemistry II (4)**

A comprehensive course in biochemistry emphasizing structural biochemistry. *Prerequisites: physical and organic chemistry; graduate-student standing.* (F)

**219A-B-C. Special Topics in Biochemistry (4-4-4)**

This special topics course is designed for first-year graduate students in biochemistry. Topics presented in recent years have included protein processing, the chemical modification of proteins, the biosynthesis and function of glycoproteins, lipid biochemistry and membrane structure, and bioenergetics. *Prerequisites: undergraduate courses in biochemistry.*

**220. Advanced Inorganic Chemistry (4)**

Introduction to theoretical inorganic chemistry. Chemistry of typical main group and transition elements; coordination com-

pounds; organometallic chemistry, catalysis, experimental techniques. *Prerequisites: Chem. 120B, 141C, and 131.*

**221. Energy Transduction (4)**

A discussion of the mechanisms for the generation and utilization of ATP in biological systems will be discussed. Specific topics will include oxidative phosphorylation, photophosphorylation, active transport muscle contraction, bioluminescence, and chemiluminescence. *Prerequisites: organic chemistry and introductory biochemistry.*

**222. Biochemical Evolution (4)**

The course emphasizes the chemical aspects of evolution, including the origin of living systems on earth, primitive energy acquisition devices, the coupling of information storage and replication catalysis, protein evolution, and the biochemical unity and diversity of extant organisms. *Prerequisites: organic chemistry and introductory biochemistry.*

**223. Organometallic Chemistry (4)**

A survey of this field from a synthetic and mechanistic viewpoint. Reactivity patterns for both main group and transition element organometallic compounds will be discussed and organized to periodic trends.

**224. Spectroscopic Techniques (4)**

Application of physical techniques to the elucidation of the structure of inorganic complex ions and organometallic compounds. Topics covered include group theory, and its application to vibrational, magnetic resonance and Raman spectroscopy.

**226. Mechanistic Aspects of Catalytic Reactions (4)**

Mechanisms of substitution and electron transfer reaction of inorganic complexes will be examined from an experimental point of view. A quantitative treatment of rate laws, the steady state approximation and multistep mechanisms of reactions that are catalyzed by soluble transition metal complexes.

**227. Seminar in Inorganic Chemistry (2)**

Seminars presented by faculty and students on topics of current interest in inorganic chemistry, including areas such as bioinorganic, organometallic and physical-inorganic chemistry. The course is designed to promote a critical evaluation of the available data in specialized areas of inorganic chemistry. Each quarter three or four different topics will be discussed. *Prerequisite: graduate standing or consent of instructor.*

**229. Special Topics in Inorganic Chemistry (2-4)**

**235. Spectroscopy and Structure (4)**

The interaction of electromagnetic radiation with molecules and bulk matter: x-ray and optical scattering; electronic, vibrational, and rotational spectroscopy; nuclear and electron magnetic resonance. Emphasis will be placed on the interpretation of experimental data.

**236. Atherosclerosis (2)**

This multidisciplinary course integrates the studies of the pathogenesis of atherosclerosis, with emphasis on lipoprotein metabolism, and the cellular and biochemical mechanisms of lesion development. Two-hour lectures. Same as Medicine 236. *Prerequisite: biochemistry.*

**237. Molecular Glycobiology (2)**

Molecular glycobiology encompasses studies of the structure, biosynthesis and biological roles of oligosaccharide units on glycoconjugates. This course will provide an overview of this rapidly evolving field with an emphasis on the glycoconjugates of eucaryotic organisms in the animal kingdom.

**242. Natural Products Chemistry (4)**

An outline of the chemistry of terpenes, steroids, alkaloids, and plant phenols developed on the basis of modern biogenetic theory. Special emphasis will be given to biologically active substances such as hormones and antibiotics. *Prerequisites: Chem. 140A-B-C or 141A-B-C.*



**244. Synthesis of Complex Molecules (4)**

This course discusses planning economic routes for the synthesis of complex organic molecules. The uses of specific reagents and protecting groups will be outlined as well as the control of stereochemistry during a synthesis. Examples will be selected from the recent literature. *Prerequisite: Chem. 148 or 248.*

**245. Structure and Properties of Organic Molecules (4)**

Introduction to the measurement and theoretical correlation of the physical properties of organic molecules. Topics to be covered include molecular orbital theory, bond lengths, bond energies, dipole moments, ionization potentials, infrared and ultraviolet spectra, nuclear magnetic resonance, and electron spin resonance.

**246. Kinetics and Mechanism (4)**

Methodology of mechanistic organic chemistry: integration of rate expressions, determination of rate constants, transition state theory; catalysis, kinetic orders, isotope effects, substitute effects, solvent effects, linear free energy relationship; product studies, stereochemistry; reactive intermediates; rapid reactions.

**247. Mechanisms of Organic Reactions (4)**

A qualitative approach to the mechanism of various organic reactions; substitutions, additions, eliminations, condensations, rearrangements, oxidations, reductions, free-radical reactions, and photochemistry. Includes considerations of molecular structure and reactivity, synthetic methods, spectroscopic tools, and stereochemistry. The topics emphasized will vary from year to year. This is the first quarter of the graduate organic chemistry sequence. *Prerequisite: Chem. 141C.*

**248. Synthetic Methods in Organic Chemistry (4)**

A survey of reactions of particular utility in the organic laboratory. Emphasis is on methods of preparation of carbon-carbon bonds and oxidation-reduction sequences. *Prerequisite: Chem. 141C or consent of instructor.*

**249. Special Topics in Organic Chemistry (2-4)****250. Seminar in Chemistry (2)**

Regularly scheduled seminars by first-year graduate students provide opportunities for practice in seminar delivery and for the exploration of topics of general interest. (S/U grades only.) (S)

**251. Research Conference (2)**

Group discussion of research activities and progress of the group members. *Prerequisite: consent of instructor.* (S/U grades only.) (F,W,S)

**253. Current Topics in Chemistry (2)**

This course is designed to present recent publications in areas of chemistry which are related to the field in which graduate students are doing thesis work. Original papers are presented by both faculty and students, followed by discussion of the material presented. *Prerequisite: consent of instructor.* (S/U grades only.)

**267. Biochemistry of Lipid and Lipoprotein Diseases (4)**

The central theme of this course will be to develop a broad understanding of the basic biochemical aspects of lipid metabolism, the regulation of lipid metabolism, and application to the treatment of specific human diseases. (Not offered every year.)

**272. Nuclear and Cosmochemistry (4)**

Introduction to cosmochemistry with emphasis on nuclear aspects. Structure and properties of nuclei. Nuclear reactions. Radioactive decay processes. Abundance and synthesis of the elements. Chronology of events in the early solar system. Origin and early history of the solar system. Effects of cosmic-ray bombardment. *Prerequisite: consent of instructor.*

**293. Cosmochemistry Seminar (2)**

Formal seminars or informal sessions on topics of current interest in cosmochemistry as presented by visiting lecturers, local researchers, or students. *Prerequisite: advanced graduate-student standing.* (S/U grades only.) (F,W,S)

**294. Organic Chemistry Seminar (2)**

Formal seminars or informal puzzle sessions on topics of current interest in organic chemistry, as presented by visiting lecturers, local researchers, or students. *Prerequisite: advanced graduate-student standing.* (S/U grades only.) (F,W,S)

**295. Biochemistry Seminar (2)**

Formal seminars or informal puzzle sessions on topics of current interest in biochemistry, as presented by visiting lecturers, local researchers, or students. *Prerequisite: advanced graduate-student standing.* (S/U grades only.) (F,W,S)

**296. Chemical Physics Seminar (2)**

Formal seminars or informal sessions on topics of current interest in chemical physics as presented by visiting lecturers, local researchers, or students. *Prerequisite: advanced graduate-student standing.* (S/U grades only.) (F,W,S)

**298. Special Study in Chemistry (1-4)**

Reading and laboratory study of special topics under the direction of a faculty member. Exact subject matter to be arranged in individual cases. (S/U grades only.) Credit is limited to four units per quarter. (F,W,S)

**299. Research in Chemistry (1-12)**

*Prerequisites: graduate standing and consent of instructor.* (S/U grades only.) (F,W,S)

**500. Teaching in Chemistry (4)**

A doctoral student in chemistry is required to assist in teaching undergraduate chemistry courses. One meeting per week with instructor, one or more meetings per week with assigned class sections or laboratories, and attendance at the lecture of the undergraduate course in which he or she is participating. *Prerequisites: graduate standing and consent of instructor.* (S/U grades only.) (F,W,S)

## CHINESE STUDIES

OFFICE: 3084 Humanities and Social Sciences Building, Muir College

**Professors**

Joseph C.Y. Chen, Ph.D., *Physics*  
 Matthew Y. Chen, Ph.D., *Linguistics*  
 Joseph W. Esherick, Ph.D., *History, Chair*  
 Chalmers Johnson, Ph.D., *IR/PS*  
 David K. Jordan, Ph.D., *Anthropology*  
 Richard P. Madsen, Ph.D., *Sociology*  
 Paul G. Pickowicz, Ph.D., *History*  
 Susan L. Shirk, Ph.D., *Political Science*  
 William S. Tay, Ph.D., *Literature*  
 Wai-Lim Yip, Ph.D., *Literature*

**Associate Professor**

Barry J. Naughton, Ph.D., *IR/PS*

**Assistant Professors**

Tun-jen Cheng, Ph.D., *IR/PS*  
 Dorothy Ko, Ph.D., *History*

**Lecturer WSOE**

Ping C. Hu, M.A., *Chinese*

**Visiting Lecturers**

Xiao-gang Cha, M.A., *Chinese*

Li-yi Huang, Ph.D., *Chinese*

Chinese studies is an interdisciplinary program that allows the student interested in China to utilize the university's offerings in various departments to build a major leading to a B.A. degree. In addition to coordinating courses in the various departments, the Program in Chinese Studies offers courses directly under its own auspices to round out the available offerings.

Many of the participating faculty in the program have a converging interest in contemporary China. For this reason, this is one of the strongest programs on modern Chinese society now available. Another focal point of research interest is the intellectual history and the evolution of scientific ideas and technology in pre-modern China. The interdisciplinary nature of the program (see departmental affiliation of the participating faculty) can accommodate students of a wide range of interests. In addition to our local resources, the University of California Education Abroad Program (EAP) and Opportunities Abroad Program (OAP) are affiliated with various universities and language institutes in China, Taiwan, and Hong Kong. This, together with other academic exchange programs with a number of Chinese universities, provides the possibility of a junior year abroad, including both language courses and courses dealing with various aspects of Chinese studies. Subject to final approval by the program chair, EAP credits may be transferred back to UCSD to coordinate with on-campus offerings.

**THE MAJOR PROGRAM**

The student choosing a major in Chinese studies must meet the following requirements:

1. Two years of Mandarin Chinese (Chinese Studies 11-12-13 and 21-22-23 or equivalent).
2. Twelve upper-division courses in Chinese studies, including courses taken in at least three departments. At least one of these courses should be a seminar in which students would be expected to write a substantial term paper. No more than six upper-division language courses count toward the major requirement.
3. As a rule, only courses taken for a letter grade can satisfy program requirements (major, minor). Exceptions are granted for Chinese Studies 198 and 199.

In principle, the courses included in the Program in Chinese Studies are those campus offerings dealing with China or the Chinese language.

## CHINESE STUDIES

Most of the courses listed below are planned by participating departments for the 1992-93 academic year.

### HONORS PROGRAM

Requirements for admission to the program are:

1. Junior standing
2. A GPA of 3.5 or better in the major
3. Overall GPA of 3.2 or better
4. Recommendation of a faculty sponsor familiar with the student's work
5. Completion of at least four upper-division courses approved by the Program in Chinese Studies
6. Completion of at least one year of Chinese language study

Students who qualify for honors take a two-quarter sequence of directed study during which they define a research project, carry out the research, and complete a senior thesis.

The completed thesis will be evaluated by a committee consisting of the student's thesis adviser and one other faculty member appointed by the Chinese studies program coordinator.

### THE MINOR PROGRAM

A minor in Chinese studies consists of six courses taken for a letter grade (no more than three lower-division) approved by a college. Chinese Studies 11-12-13, Chinese Studies 21-22-23, and History 10-11-12 may apply as lower-division. At least three courses have to be in a discipline *other* than language study. A list of approved offerings is available quarterly in the Program in Chinese Studies office.

## Courses

### COMMITTEE-SPONSORED COURSES

11-12-13. First-Year Chinese (5-5-5)

21-22-23. Second-Year Chinese (4-4-4)

111-112-113. Third-Year Chinese (4-4-4)

121-122-123. Fourth-Year Chinese (4-4-4)

**All Chinese language courses have an A track for students with no Chinese language background and a B track for students with some Chinese language background.**

30. Introduction to Chinese Language (4)

Introduces a basic knowledge of Chinese language: the characteristics of modern Chinese, its phonetic, grammatic and writ-

ing systems, the historical development of the language, Chinese dialects, colloquial and literary styles, etc.

150. Intensive Summer Language and Culture Program in China (4)

Intensive language and cultural study at one or more sister institutions in China. Program includes regularly scheduled language classes taught by UCSD staff members; a cultural program of films, stage performances and lectures; and field trips to villages, urban industrial communities, and places of historical interest. The entire program will be conducted in Chinese. *Prerequisites: Chinese Studies 13 or equivalent and consent of instructor.* (Summer)

163. Introduction to Chinese Linguistics (4)

This course is an introduction to linguistics for students of the Chinese language. It covers phonological and grammatical structures, dialectology, and a brief survey of the history of the language.

170. History of Science in China (4)

This course is designed to provide a coherent picture of aspects of the development of science in Chinese civilization from ancient times through the eighteenth century. The focus (mathematics, astronomy, medicine, chemistry, etc.) will shift from year to year.

180. Chinese Cinema (4)

This course surveys the development of Chinese cinema from the 1920s to the present. Emphasis is placed on the ways in which filmmakers have represented such major social problems as family conflict, gender relations, and the tension between traditional and modern cultural modes. *Prerequisite: knowledge of Chinese.*

181A. Introduction to Classical Chinese (4)

Introduction to the classical language through Confucius, Mencius, and the other Great Books. The emphasis will be on comprehension and reading ability. *Prerequisite: Chinese Studies 23 or equivalent.*

181B. Introduction to Classical Chinese (4)

Continuation of Chinese Studies 181A. *Prerequisite: Chinese Studies 181A or equivalent.*

181C. Introduction to Classical Chinese (4)

This course is a continuation of 181A and B. Short passages from major historical, literary, and philosophical works are introduced. *Prerequisite: Chinese Studies 181B or equivalent.*

182A. Intermediate Classical Chinese (4)

This course is a continuation of Introduction to Classical Chinese (181A-B-C). Selections from major works written in classical Chinese, such as Laozi, Shijing, etc., will be read. The course emphasizes the structures, function words, the analysis of each sentence, and the comprehension of texts. *Prerequisite: Chinese Studies 181A-B-C, or equivalent.*

182B. Intermediate Classical Chinese (4)

This course is a continuation of 182A. Selections from Zhuangzi, Shiji, etc., will be taught. The course emphasizes the structures, function words, the analysis of each sentence, and the comprehension of texts. *Prerequisite: Chinese Studies 182A, or equivalent.*

182C. Intermediate Classical Chinese (4)

This course is a continuation of 182B. Selections from I Ching, Hanshu, etc., will be introduced. The course emphasizes the structures, function words, the analysis of each sentence, and the comprehension of texts. *Prerequisite: Chinese Studies 182B, or equivalent.*

183. Readings in Classical Chinese (4)

Introduction to major works written in classical Chinese, including poetry and historical documents. *Prerequisite: Chinese Studies 181B or equivalent.*

185. Syntactic Structures of Chinese (4)

This course introduces the phrase structures and basic word order of Chinese. It compares the most common syntactic structures of modern Chinese and English. *Prerequisite: three years of Chinese or equivalent.*

196. Directed Thesis Research (4)

B.A. honors thesis under the direction of a faculty member in Chinese studies. *Prerequisite: consent of instructor.* (F,W,S)

198. Directed Group Study in Chinese Studies (2 or 4)

Study of specific aspects in Chinese civilization not covered in regular course work, under the direction of faculty members in Chinese studies. (P/NP grades only.) *Prerequisite: consent of instructor.* (F,W,S)

199. Independent Study in Chinese Studies (2 or 4)

The student will undertake a program of research or advanced reading in selected areas in Chinese studies under the supervision of a faculty member of the Program in Chinese Studies. (P/NP grades only.) *Prerequisite: consent of instructor.* (F,W,S)

296. Directed Thesis Research (2-12)

Graduate thesis research under the guidance of a faculty member affiliated with the Program in Chinese Studies.

299. Independent Study in Chinese Studies (2-12)

Independent graduate research under the guidance of a faculty member affiliated with the Program in Chinese Studies.

500. Apprentice Teaching (1-4)

A course in which teaching assistants are aided in learning proper teaching methods by means of supervision of their work by the faculty; handling of discussions, preparation and grading of exams and other written exercises, and student relations.

### DEPARTMENT-SPONSORED COURSES

For description of courses listed below, see appropriate departmental listing. All graduate-level courses require consent of the instructor for undergraduate students.

#### LOWER DIVISION

History HILD 10. East Asia: The Great Tradition (staff)

History HILD 11. East Asia and the West (staff)

History HILD 12. Twentieth-Century East Asia (staff)

#### UPPER DIVISION

##### ■ I. CHINESE SOCIETY

ANRG 170: Traditional Chinese Society (Jordan) (formerly AN 144)

ANRG 171: Chinese Familism (Jordan) (formerly AN 109)

ANRG 172: Culture and Personality in China (Jordan) (formerly AN 136)

ANRG 173: Chinese Popular Religion (Jordan) (formerly AN 103)

History HITO 102: Asian Religions (Staff)

History HIEA 164: Women and Family in Chinese History (Ko)

■ **II. CONTEMPORARY CHINA**

- History HIEA 132: History of the People's Republic of China (Pickowicz)
- IR/PS IP/Gen 400: International Relations of the Pacific (Johnson)
- IR/PS IP/Core 430: Economic and Social Development of China (Naughton)
- IR/PS IP/Core 431: Chinese Politics (Shirk)
- IR/PS IP/Gen 465: Economy of China (Naughton)
- IR/PS IP/Gen 466: Chinese Foreign Policy (Shirk)
- Political Science 130CA-CB: Comparative Communism (Shirk)
- Political Science 130B: Politics in the People's Republic of China (Shirk)
- Political Science 130D: Seminar—Chinese Politics (Shirk)
- Political Science 232: The Chinese Political System (Shirk)
- Sociology 188B: Chinese Society (Madsen)

■ **III. LANGUAGE AND LITERATURE**

- Linguistics 141: Language Structures (M. Chen)
- Literature/Chinese 101: Readings in Contemporary Chinese Literature (Tay/Yip)
- Literature/Chinese 120: Readings in Classical Chinese Poetry (Tay/Yip)
- Literature/Chinese 140A: Classical Chinese Literature (Tay/Yip)
- Literature/Chinese 140B: Modern Chinese Literature (Tay/Yip)
- Literature/Chinese 140C: Contemporary Chinese Literature (Tay/Yip)
- Literature/Comparative: 252: Modernism: East and West (Yip)
- Literature/Comparative 274: Genre Studies: History, Politics, and Social Changes in Taiwan Films (Tay)
- Literature/English 172: American Poetry II—Chinese Poetry and the American Imagination (Yip)
- Literature/General 180: Visual Arts and Literature Landscapé Poetry: East and West (Yip)
- Literature/General 184: Ethnopoetics (Yip)
- Literature/General 185: Literature and Ideas: Taoism (Yip)
- Literature/Th 230: Comparative Literary Theory: Classical Chinese Poetics (Yip)
- Literature Writing 111: Prose Poem (Yip)

■ **IV. CHINESE HISTORY**

- History HIEA 120: The History of Chinese Thought and Society: The Ancient Imperial Period (Staff)

- History HIEA 121: The History of Chinese Thought and Society: The Middle Imperial Period (Staff)
- History HIEA 122: The History of Chinese Thought and Society: The Late Imperial Period (Staff)
- History HIEA 125: History of Women in China (Staff)
- History HIEA 130: History of the Modern Chinese Revolution: 1800-1911 (Esherick)
- History HIEA 131 (IP/GEN 408): History of the Modern Chinese Revolution: 1911-1949 (Pickowicz)
- History HIEA 132: History of the People's Republic of China (Pickowicz)
- History HIEA 163: Cinema and Society in Twentieth-Century China (Pickowicz)
- History HIEA 164: Women and Family in Chinese History (Ko)
- History HIEA 165: The Chinese Village in Transition: 1930-1956 (Pickowicz)
- History HIEA 167: Special Topics on Modern Chinese History (Esherick)
- History HIEA 168: Chinese Thought from Chou through Sung (Staff)
- History HIEA 169: Literature and Society in Republican China (Pickowicz)

▼ **CLASSICAL STUDIES**

OFFICE: 3071 Humanities and Social Sciences Building, Muir College (CAESAR office)

**Professors**

- Page Ann duBois, Ph.D., *Classical and Comparative Literature*
- Richard E. Friedman, Ph.D., *Hebrew and Comparative Literature*
- Edward N. Lee, Ph.D., *Philosophy*
- Alden A. Moshammer, Ph.D., *History*

**Associate Professors**

- Georgios H. Anagnostopoulos, Ph.D., *Philosophy*
- Anthony T. Edwards, Ph.D., *Classical Literature and Languages*
- William Fitzgerald, Ph.D., *Classical and Comparative Literature*
- Sheldon Nodelman, Ph.D., *Visual Arts*

**Lecturers**

- Charles Chamberlain, Ph.D., *Classical and Comparative Literature*
- Leslie Collins Edwards, Ph.D., *Classical Literature and Languages*
- Eliot Wirshbo, Ph.D., *Classical Literature and Languages*

Classical studies is concerned with the cultures of ancient Greece and Rome—roughly from the time of Homer through the time of St. Augustine—in all of their aspects. This program thus offers undergraduates an opportunity to study the cultures of Greece and Rome through the combined resources of the Departments of History, Literature, Visual Arts, and Philosophy. The study of the ancient Greek and Latin languages themselves serves as the starting point for the broader consideration of specific texts in their literary, intellectual, and historical context. In cooperation with the Judaic Studies Program, moreover, students are provided the opportunity to link the study of ancient Greece to that of the ancient Near East.

**THE MAJOR PROGRAMS**

The Classical Studies Program offers four different degree paths, three within classical studies and one in cooperation with Judaic studies. The majors are Greek, Latin, classics, and Greek and Hebrew. Each consists of a choice of twelve upper-division courses approved for the program and listed below. All courses used to meet requirements for a major in classical studies must be taken for a letter grade and be passed with a grade of C — or better.

■ **GREEK**

Classical Studies 19A-B-C are a prerequisite to the Greek major. Six of the twelve upper-division courses must be Lit/Greek courses numbered 100 and above, but exclusive of Lit/Greek 101. The remaining six courses may be in classical civilization (in English translation), selected from the list of approved courses from history, Lit/General, philosophy, political science, and visual arts, though additional Lit/Greek courses numbered 100 and above (including Lit/Greek 101) are acceptable here. These must be from at least two departments and selected in consultation with the adviser; courses dealing with Greek civilization are strongly preferred.

■ **LATIN**

Classical Studies 19A-B-C are a prerequisite to the Latin major. Six of the twelve upper-division courses must be Lit/Latin courses numbered 100 and above, but exclusive of Lit/Latin 101 and 102. The remaining six courses may be in classical civilization (in English translation), selected from the list of approved courses from history, Lit/General, philosophy, political science, and visual arts, though additional Lit/Latin courses numbered 100 and above (including Lit/Latin 101 and 102) are acceptable here. These must be from at least two departments and se-

lected in consultation with the adviser; courses dealing with Roman civilization are strongly preferred.

■ **CLASSICS**

Classical Studies 19A-B-C are a prerequisite to the classics major. Nine of the twelve upper-division courses must be distributed between Lit/Latin and Lit/Greek courses numbered 100 and above (but exclusive of Lit/Latin 101 and 102 and Lit/Greek 101), six in one literature and three in the other according to the student's emphasis. The remaining three courses may be in classical civilization (in English translation), selected from the list of approved courses from history, Lit/General, philosophy, political science, and visual arts, though additional Lit/Latin or Lit/Greek courses numbered 100 and above (including Lit/Latin 101 and 102 and Lit/Greek 101) are acceptable here. These must be from at least two departments and selected in consultation with the adviser to reflect the relative emphasis upon the Greek and Latin literatures, but with at least one focusing upon each culture.

■ **GREEK AND HEBREW**

Three courses from Classical Studies 19A-B and Cultural Traditions, Judaic 1A-B, to be selected in consultation with the adviser, are a prerequisite to the Greek and Hebrew major. Nine of the twelve upper-division courses must be distributed between Lit/Greek courses numbered 100 and above (but exclusive of Lit/Greek 101) and Judaic Studies 101-102-103 or Lit/Hebrew courses numbered 148 and above, six in one literature and three in the other according to the student's emphasis. The remaining three courses may be in ancient Greek and Judaic civilization (in English translation), selected from the list of courses approved for classical studies and from the list of courses approved for Judaic studies, though additional Lit/Greek courses numbered 100 and above (including Lit/Greek 101) or Judaic Studies 101-102-103 or Lit/Hebrew courses numbered 148 and above are acceptable here. These must be from at least two departments and selected in consultation with the adviser (who is selected in accordance with the student's emphasis) to reflect the relative emphasis upon the Greek and Hebrew literatures, but with at least one course from each program.

Students who began work before fall 1991 on a major in classical studies, whether at UCSD or elsewhere, as described in a pre-1991 *UCSD General Catalog*, may be eligible to complete the major as described there.

**THE MINOR PROGRAMS**

**Classical Studies:**

A minor in classical studies consists of six courses from those listed below, of which at least three must be upper division. A knowledge of the ancient languages is not required. The minor will normally include Classical Studies 19A-B-C: the Greco-Roman World, and three other courses from the participating departments.

**Greek:**

See Literature: "The Minor in Literature"

**Latin:**

See Literature: "The Minor in Literature"

**WARREN COLLEGE**

A Warren College program of concentration in classical studies normally consists of Classical Studies 19A-B-C and three of the upper-division courses listed below.

Graduate courses may be taken by undergraduates with consent of the instructor. The faculty of the program welcomes qualified undergraduates in graduate courses.

Additional courses counting toward a major in classical studies are offered on a year-to-year basis, both at the undergraduate and graduate levels. As these often cannot be listed in advance, interested students should consult the program faculty for an up-to-date list.

**HONORS IN GREEK, LATIN, AND CLASSICS**

Honors is intended for the most talented and motivated students majoring in Greek, Latin, classics, or Greek and Hebrew. Requirements for admission to the honors program are:

1. Junior standing
2. An overall GPA of 3.5
3. A GPA in the major of 3.7

Qualified students majoring in Greek, Latin, or classics may apply at the end of their junior year to the program faculty on the basis of 1) a thesis proposal (three to four pages) worked out in advance with a classical studies faculty member and 2) a recommendation from that faculty member. It is strongly advised that the proposal be based upon a class paper or project from a course taken towards completion of the major.

The core of the honors program is an honors thesis. The research and writing of the thesis will be conducted over the winter or fall and winter terms of the senior year. Up to four hours of 196 credit to this end may be counted towards the major in place of one of the courses in English translation. Theses completed by the end of the

winter quarter of the senior year will be read and evaluated by the thesis adviser and another member of the program faculty. If the thesis is accepted and the student maintains a 3.7 GPA, departmental honors will be awarded. The level of honors—distinction, high distinction, or highest distinction—will be determined by the program faculty.

Students choosing a major in Greek and Hebrew may complete an honors major as follows. Those with an emphasis on Greek must meet the requirements for honors in the Classical Studies Program and work with a thesis adviser from classical studies, but select a second adviser for the thesis from Judaic studies. Those with an emphasis on Hebrew must meet the requirements for honors in the Judaic Studies Program and work with a thesis adviser from Judaic studies, but select a second adviser for the thesis from classical studies.

**Courses**

**UNDERGRADUATE**

**Classical Studies 19A-B-C. Introduction to the Ancient Greeks and Romans (4-4-4)**

This interdisciplinary sequence includes the literature, mythology, art, philosophy, and history of ancient Greece and Rome, a complex civilization which had a determining influence on all later Western culture.

**Classical Studies 51. Bio-Scientific Vocabulary (Greek-Latin Roots) (4)**

Intensive exposure (100 words per week) to Greek and Latin roots, prefixes, and suffixes which form the basis of bio-scientific terminology. Extensive practice in word building and analysis. No knowledge of Greek or Latin required.

**Classical Studies 107. Myth, Religion, and Philosophy in Late Antiquity (4)**

**Classical Studies 111. Topics in Ancient Greek Drama (4)**

Close reading and discussion of selected works of ancient Greek drama in translation. (Course may be repeated for credit when topic varies.) *Prerequisite: sophomore standing.*

**Cultural Traditions. Judaic 1A-B (4-4)**

**Humanities 1. The Foundations of Western Civilization: Israel and Greece (6)**

*Prerequisite: satisfaction of the Subject A requirement. (W)*

**Humanities 2. Rome, Christianity, and the Medieval World (6)**

*Prerequisite: satisfaction of the Subject A requirement. (S)*

**Humanities 3. Renaissance, Reformation, and Early Modern Europe (4)**

*Prerequisite: satisfaction of the Subject A requirement. (F)*

**HIEU 100. Early Greece (4)**

**HIEU 101. Greece in the Classical Age (4)**

**HIEU 102. The Roman Republic (4)**

**HIEU 103. The Roman Empire (4)**

- HIEU 160. Alexander the Great and the Hellenistic World (4)**
- HIEU 161. The Decline of Rome (4)**
- HIEU 199. Independent Study in Greek and Roman History (4)**
- HINE 100. The Ancient Near East and Israel (4)**
- Lit/Gk 1-2-3. Beginning and Intermediate Greek (4-4-4)**
- Lit/Gk 100. Introduction to Greek Literature (4)**
- Lit/Gk 101. Advanced Greek Grammar and Prose Composition (4)**
- Lit/Gk 110. Archaic Period (4)**  
Previously Lit/Gk 112.
- Lit/Gk 112. Homer (4)**
- Lit/Gk 113. Classical Period (4)**  
Previously Lit/Gk 114.
- Lit/Gk 118. Hellenistic Period (4)**  
Previously Lit/Gk 116.
- Lit/Gk 120. New Testament Greek (4)**  
Previously Lit/Gk 119.
- Lit/Gk 130. Tragedy (4)**  
Previously Lit/Gk 104.
- Lit/Gk 131. Comedy (4)**  
Previously Lit/Gk 106.
- Lit/Gk 132. History (4)**  
Previously Lit/Gk 108.
- Lit/Gk 133. Prose (4)**  
Previously Lit/Gk 110.
- Lit/Gk 134. Epic Poetry (4)**  
Previously Lit/Gk 121.
- Lit/Gk 135. Lyric Poetry (4)**  
Previously Lit/Gk 123.
- Lit/Gk 199. Special Studies (2 or 4)**
- Lit/La 1-2-3. Beginning and Intermediate Latin (4-4-4)**
- Lit/La 100. Introduction to Latin Literature (4)**
- Lit/La 101. Advanced Grammar and Composition (4)**
- Lit/La 102. Prose Composition (4)**
- Lit/La 111. Pre-Augustan (4)**  
Previously Lit/La 116.
- Lit/La 113. Augustan (4)**  
Previously Lit/La 118.
- Lit/La 114. Vergil (4)**
- Lit/La 116. Silver Latin (4)**  
Previously Lit/La 120.
- Lit/La 120. Late Latin (4)**  
Previously Lit/La 122.
- Lit/La 124. Medieval Latin (4)**
- Lit/La 126. Renaissance Latin (4)**  
Previously Lit/La 129.
- Lit/La 130. The Novel (4)**  
Previously Lit/La 106.
- Lit/La 131. Prose (4)**  
Previously Lit/La 108.

- Lit/La 132. Lyric and Elegiac Poetry (4)**  
Previously Lit/La 110.
- Lit/La 133. Epic (4)**  
Previously Lit/La 112.
- Lit/La 134. History (4)**  
Previously Lit/La 114.
- Lit/La 199. Special Studies (2 or 4)**
- Lit/Gen 100. The Classical Tradition (4)**  
Previously Lit/Gen 120. (May be repeated for credit as topics vary.)
- Lit/Gen 181. Mythology (4)**  
Previously Lit/Gen 119.
- Philosophy 101. Plato (4)**
- Philosophy 102. Aristotle (4)**
- Philosophy 108. Mythology and Philosophy (4)**
- Philosophy 199. Independent Study (4)**
- Pol. Sci. 110A. Systems of Political Thought (Greece and Rome) (4)**
- Theatre 159. Ancient Greek Drama in Modern Versions (4)**
- Visual Arts 11. Western Art I: Prehistoric to Medieval (4)**
- Visual Arts 120A. Greek Art (4)**
- Visual Arts 120B. Roman Art (4)**
- Visual Arts 120C. Late Antique Art (4)**

## GRADUATE

- HIGR 201. The Literature of Ancient History (4)**
- HIGR 298. Directed Readings in Greek and Roman History (1-12)**
- Lit/Co 202A. History of Criticism and Aesthetics (4)**
- Lit/Co 210. Classical Studies (4)**  
*Prerequisite: working knowledge of either Greek or Latin.*
- Lit/Gk 297. Directed Studies (1-12)**
- Lit/Gk 298. Special Projects (4)**
- Lit/La 297. Directed Studies (1-12)**
- Lit/La 298. Special Projects (4)**
- Philosophy 201. Greek Philosophy (4)**
- Philosophy 202. Hellenistic and Roman Philosophy (4)**
- Philosophy 290. Directed Independent Study (1-4)**

- Nelson Butters, Ph.D., *In Residence/Psychiatry*
- Joel E. Dimsdale, M.D., *In Residence/Psychiatry*
- Mark A. Geyer, Ph.D., *In Residence/Psychiatry*
- J. Christian Gillin, M.D., *Psychiatry*
- Igor Grant, M.D., *Psychiatry*
- Philip M. Groves, Ph.D., *Psychiatry*
- Robert K. Heaton, Ph.D., *Psychiatry, Program Director*
- Dilip V. Jeste, M.D., *In Residence/Psychiatry*
- Lewis L. Judd, M.D., *Chair of Psychiatry*
- Robert M. Kaplan, Ph.D., *Community and Family Medicine*
- Daniel F. Kripke, M.D., *In Residence/Psychiatry*
- Nolan E. Penn, Ph.D., *Psychiatry*
- Laura Schreiberman, Ph.D., *Psychology*
- Marc A. Schuckit, M.D., *Psychiatry*
- David S. Segal, Ph.D., *Psychiatry*
- Stephen R. Shuchter, M.D., *Clinical/Psychiatry*
- Larry R. Squire, Ph.D., *In Residence/Psychiatry*
- Lowell H. Storms, Ph.D., *In Residence/Psychiatry*
- Sidney Zisook, M.D., *Psychiatry*

### Associate Professors

- Sonia Ancoli-Israel, Ph.D., *In Residence/Psychiatry*
- J. Hampton Atkinson, Jr., M.D., *Adjunct/Psychiatry*
- Karen Britton, M.D., Ph.D., *In Residence/Psychology*
- Sandra Brown, Ph.D., *In Residence/Psychiatry*
- Eric Courchesne, Ph.D., *In Residence/Neurosciences*
- Dean Delis, Ph.D., *In Residence/Psychiatry*
- Michael Irwin, M.D., *In Residence/Psychiatry*
- Terry Jernigan, Ph.D., *In Residence/Psychiatry*
- James A. Kulik, Ph.D., *Psychology*
- Doris A. Trauner, M.D., *Neurology*

### Assistant Professors

- Denis F. Darko, Ph.D., *Adjunct/Psychiatry*
- Jeffrey Matloff, Ph.D., *Clinical/Psychiatry*
- Thomas L. Patterson, Ph.D., *Adjunct/Psychiatry*
- Jane Paulsen, Ph.D., *Adjunct/Psychiatry*
- David P. Salmon, Ph.D., *In Residence/Psychiatry*
- Mark Slater, Ph.D., *Adjunct/Psychiatry*

## THE JOINT DOCTORAL PROGRAM

The interdisciplinary partnership of the Department of Psychiatry at UCSD School of Medicine and the Department of Psychology at San Diego State University greatly extends the range of perspectives and furnishes unusual opportunities for graduate study leading to the Ph.D. degree in clinical psychology. The Joint Doctoral Group in Clinical Psychology currently consists of faculty from the UCSD Department of Psychiatry, School of Medicine, and the Departments of

## CLINICAL PSYCHOLOGY

OFFICE: 216 Gifford Mental Health Clinic  
497-6659

### Professors

- Ursula Bellugi, Ed.D., *Adjunct/Psychology*
- Gary R. Birchler, Ph.D., *Clinical/Psychiatry*
- David L. Braff, M.D., *Psychiatry*



Neurosciences, Community and Family Medicine, Psychology, and SDSU Department of Psychology and School of Public Health.

Information regarding admission is found in the current edition of the *Bulletin of the Graduate Division* of San Diego State University.

The program goal is to train clinical psychologists who are accomplished both as clinicians and as research scientists. The curricula and training provide a strong foundation in clinical psychological concepts, methods, theories and data, together with intensive concentrations in specialized areas of clinical psychology. Currently our program has three areas of specialization: behavioral medicine, neuropsychology, and experimental psychopathology.

The scientist-practitioner model on which this program is based requires that students receive ongoing supervised research experience, including planning, design, implementation, analysis, and communication of findings. Equally important is extensive supervised experience aimed at developing sound general and specialized clinical skills. Students are expected to be actively involved in all these activities throughout their tenure in the program.

The program is designed as a five-year curriculum, including a one-year clinical internship. There is a minimum residency requirement of one year at each institution. The curriculum is based on a twelve-month academic year. The program is accredited by the American Psychological Association.

Specific courses currently required as part of the core at UCSD include: Clinical Psychology 224; Clinical Psychology 294; Clinical Psychology 295; Clinical Psychology 296 (independent study, lab practicum); Clinical Psychology 299 (independent study project); School of Medicine 202E (Psychopathology).

### PH.D. TIME LIMIT POLICIES

Students must be advanced to candidacy by the end of five years. Total university support cannot exceed six years. Total registered time at UCSD cannot exceed seven years.

## Courses

**Clinical Psychology 205. Neuroanatomy (6)**  
Fundamental anatomy/physiology of human nervous system, emphasizing higher cortical functions. Methods of clinical problem solving in neurology; background in basic neuropsychological skills.

**Clinical Psychology 224. Introduction to Neuropsychology (1)**  
Introduction to study of brain-behavior relationships and to clinical neuropsychological assessment.

**Clinical Psychology 294. Pro-Seminar in Neuropsychology (3)**  
Provides a fundamental knowledge of brain-behavior relationships as well as strategies and methods of neuropsychological assessment and rehabilitation.

**Clinical Psychology 295. Introduction to Research of UCSD/SDSU Faculty (4)**  
How to evaluate a psychological experiment; using a research evaluation guide, students will evaluate two faculty papers per week. They will also develop and present their own proposed research projects. (S/U grades only.) *Prerequisite: graduate student status in joint clinical psychology doctoral program or consent of instructor.*

**School of Medicine 202E. Social and Behavioral Sciences—Psychopathology (3)**  
This sequence will acquaint students with techniques of interviewing, concepts of mental illness and normality, basic research in causality of behavioral disorders, and approaches to treatment, all in the context of a bio-psycho-social frame of reference. Format combines a lecture followed by smaller group sessions with a faculty leader. The groups enable students to meet patients with behavioral disorders, to practice interviewing, to develop observational skills, and to discuss material presented in lectures and assigned readings. (S/U grades only.) *Prerequisite: SOM 202A,C,D or consent of instructor.*

**Clinical Psychology 296. Independent Study (1-12)**  
Independent survey of basic concepts in clinical psychology using various sources of material, including scientific papers in clinical psychology and behavioral science and other sources as seem indicated.

**Clinical Psychology 299. Graduate Research (1-12)**  
Individual study course under one or more of the joint doctoral program faculty to develop certain research questions, design a methodology to answer the questions, and then carry out actual research, data reduction, and analysis.

## COGNITIVE SCIENCE

OFFICE: 137 Cognitive Science Building

**Professors**  
Richard C. Atkinson, Ph.D.  
Elizabeth Bates, Ph.D.  
Aaron Cicourel, Ph.D.  
Jeffrey L. Elman, Ph.D.  
Gilles Fauconnier, Ph.D.  
Marta Kutas, Ph.D.  
Jean M. Mandler, Ph.D.  
Helen J. Neville, Ph.D.  
Donald A. Norman, Ph.D., *Chair*  
David Zipser, Ph.D.

**Associate Professor**  
Edwin L. Hutchins, Ph.D.

**Assistant Professors**  
John D. Batali, Ph.D.  
David Kirsh, D.Phil.  
Martin I. Sereno, Ph.D.  
Jaime A. Pineda, Ph.D.  
Mark St. John, Ph.D.

**Adjunct Professors**  
David E. Rumelhart, Ph.D.  
Terrence J. Sejnowski, Ph.D., *Biology and Physics*

## INTRODUCTION

The Department of Cognitive Science emphasizes three main areas of study: the *brain*—the understanding of neurobiological processes and phenomena; *behavior*—the experimental methods and findings from the study of psychology, language, and the sociocultural environment; and *computation*—the powers and limits of various representational formats, coupled with studies of computational mechanisms. This approach involves a multidisciplinary study of cognition with emphasis on computer science, linguistics, neuroscience, psychology, and related aspects of anthropology, biology, mathematics, philosophy, and sociology.

The study of cognition takes place within the controlled situations of the laboratory and the natural situations of the everyday world, as well as through extensive modeling and simulation studies of these situations. The unit under study ranges from the individual neuron, to neural systems, to the individual person, to social groups in which language, social organization, and culture play important roles. Each level of study can be informed through knowledge of, and the constraints imposed from, adjacent levels of study. The department also is strong in applied research in university, home, and workplace settings.

The underlying philosophy of the department poses special challenges to its faculty and students to be knowledgeable in and sympathetic to a wide variety of fields and techniques. For example, required topics for both undergraduates and graduates include courses in behavior, computation, and the neurobiological basis of cognition.

We have a commitment to student involvement, and students participate in the department by sharing their ideas and suggestions with faculty and staff. Meetings are held at least once a year for students and faculty to discuss the curriculum and other topics. A newsletter is sent to all faculty, students, staff, and visitors associated with cognitive science at UCSD. Undergraduate students may join the Students in Cognitive and Neurosciences (SCANS) organization, which provides opportunities for undergraduates to meet each other as well as faculty from UCSD and other campuses, to visit research laboratories, and to make job contacts. Graduate students select their own representatives for faculty meet-

ings, graduate admissions, departmental TA training and development programs, and the campus-wide Graduate Student Association.

## THE UNDERGRADUATE PROGRAMS

The department offers both a B.A. and a B.S. degree. The B.S. requires completion of more rigorous lower-division course work and three more courses at the upper-division level. The B.S. is recommended for majors who plan to enter the work force after graduation. Both the B.A. and the B.S. fully prepare a student for graduate studies. There is also an honors program for exceptional students in both degree programs.

### GRADE REQUIREMENTS FOR THE MAJOR

A minimum grade-point average of 2.0 is required for the B.A. or B.S. degree. Major requirements are not fulfilled by courses in which a grade of D is obtained. All courses must be taken for a letter grade, with the exception of Cognitive Science 195, 198, and 199, which are taken Pass/No Pass.

### LOWER-DIVISION REQUIREMENTS

All majors must complete lower-division courses in neurobiology, calculus, methods, and computer programming:

#### B.A. Requirements

Mathematics 1A-B-C or 2A-B-C

Cognitive Science 14

or Psychology 60 plus Philosophy 10

or Mathematics 183 plus Philosophy 10

Cognitive Science 17 or Biology 12

Cognitive Science 18

#### B.S. Requirements

Mathematics 2A-B-C

Cognitive Science 14

or Psychology 60 plus Philosophy 10

or Mathematics 183 plus Philosophy 10

Cognitive Science 17 or Biology 12

Cognitive Science 18

### UPPER-DIVISION REQUIREMENTS

The B.A. requires completion of thirteen upper-division courses, and the B.S. requires sixteen. All majors must complete three core sequences. Students are advised to complete these core sequences in their junior year, especially if they intend to apply to the honors program. The

remainder of the upper-division requirements is fulfilled by completing electives.

### CORE SEQUENCES

The B.A. and the B.S. programs require ten core courses:

Cognitive Science 101A-B-C (Cognitive Phenomena)

Cognitive Science 107A-B-C (Cognitive Neuroscience)

Cognitive Science 108A-AL-P (Modeling Cognitive Phenomena)

and either

Cognitive Science 181 (Advanced Parallel Distributed Processing Modeling)

or

Cognitive Science 182 (Advanced Artificial Intelligence Modeling)

### ELECTIVES

At least half of the electives for the major must be taken in the department. One Cognitive Science 195, 198, or 199 course may be used. A course taken outside the department must meet the following criteria:

1. The course must deal with topics and issues that are clearly part of cognitive science.
2. The material must not be available in a course offered inside the department.

This policy permits students and their advisers to be responsive to changes in course offerings. Majors must obtain departmental approval of electives.

### HONORS PROGRAM

Majors apply for admission to the honors program at the beginning of their graduating year. Applicants to the honors program must have a minimum grade-point average of 3.5 in the major and an approved thesis project sponsored by a faculty member within the department. Once accepted to the program, students must maintain a minimum grade-point average of 3.5 in the major, complete an honors thesis (190A-B) in the senior year with a grade of A, and complete one approved cognitive science graduate course to graduate with honors.

### MINORS AND PROGRAMS OF CONCENTRATION

Each college has specific requirements, and students should consult with an academic adviser in their provost's office as well as a cognitive science adviser to be sure they fulfill requirements of the college and of the department. The department requirements are fulfilled by

completing Cognitive Science 10A-B-C plus one of the following upper-division sequences:

Cognitive Science 101A-B-C

Cognitive Science 107A-B-C

Cognitive Science 108A-AL-P and 181 or 182

Cognitive Science 130-131-132

All courses must be taken for a letter grade.

### TRANSFER CREDIT

Students who wish to transfer from another institution to UCSD as cognitive science majors should work closely with university advisers to ensure that all lower-division requirements have been completed and are equivalent to those offered at UCSD. It is extremely important for students to have completed lower-division requirements by the end of their sophomore year so they are prepared for core courses in their junior year. Advanced UCSD students who wish to transfer to the department should consult with the departmental advisers about credit for courses already completed.

### THE GRADUATE PROGRAMS

There are two Ph.D. programs, each with different admissions and graduation requirements. The *Department of Cognitive Science* offers a Ph.D. in cognitive science. Students are admitted to UCSD directly into the department and fulfill degree requirements of the department. The *Interdisciplinary Program in Cognitive Science* offers a joint Ph.D. in cognitive science and a traditional home department (anthropology, computer science and engineering, linguistics, neurosciences, philosophy, psychology, or sociology). Students are admitted to UCSD through the home department and fulfill the requirements of both the interdisciplinary program and the home department.

### PH.D. IN COGNITIVE SCIENCE

This program provides broad training in neurological processes and phenomena; the experimental methods, results, and theories from the study of psychology, language, and social and cultural issues; and the studies of computational mechanisms. The first year is devoted to familiarizing the student with the findings and current problems in cognitive science through courses in foundations and issues. In the second year, basic courses and laboratory rotations are completed, with the major emphasis on the completion of a year-long research project. Future years are spent completing the advancement to candidacy requirements and doing the thesis research. Throughout the program, there are frequent fac-

ulty-student interactions, including special lectures by the faculty or invited speakers and the weekly informal research discussions and cognitive science seminar.

**ADMISSIONS**

The application deadline is January 15. The admissions committee reviews each applicant's statement of purpose, letters of recommendation, GRE scores, previous education and work experience, and grade-point averages, then recommends candidates for admission to the entire faculty, who make the final decision.

**ADVISING**

The files of entering students are reviewed by an advising committee, and an interim adviser is appointed to serve as general adviser and counselor. The adviser helps chart a set of courses that fulfill the content area requirements, taking into account the student's prior training and interests. Students may change the interim adviser at any time (as long as the new interim adviser is willing). At the time of advancement to candidacy, students choose a permanent adviser who also functions as the chair of the dissertation committee.

**SUMMARY OF REQUIREMENTS**

1. Foundations courses
2. Approved study plan, which includes issues courses, methods courses, and laboratory rotations
3. Second-year project
4. Language requirement
5. Participation in the cognitive science advanced faculty/student seminar series
6. Advancement to candidacy
7. Teaching
8. Participation in departmental events and committees
9. Ph.D. dissertation and defense

**DESCRIPTION OF REQUIREMENTS**

1. **Foundations Courses (Cognitive Science 201A-B-C-D-E-F).** Students complete foundations courses in the areas of brain, behavior, and computation, usually in the first year.
2. **Study Plan.** Students complete a study plan recommended by their adviser. The normal plan includes:
  - a. **Issues Courses.** Issues courses are required, one or two each in the areas of brain, behavior, and computation. At least

half of the issues courses should be taken within the department.

- b. **Methods Courses.** Three methods courses are required. In the first year, Psychology 201A (or equivalent knowledge) is required. Students are also encouraged to take a statistics course, such as Psychology 201B. In the second year, Cognitive Science 204A-B is taken concurrently with Cognitive Science 203A-B.
  - c. **Laboratory Rotations (Cognitive Science 290).** Three rotations in different faculty laboratories are required. Each rotation is for a full quarter, and all rotations should be completed by the end of fall quarter of the second year.
3. **Second-Year Research Project (Cognitive Science 203A-B-C).** In the summer between the first and second year, students work with their adviser and a faculty committee to develop a prospectus for a research project. The year-long project culminates with written and oral presentations to the faculty at the end of spring quarter.
  4. **Language Requirement.** The main goal of the language requirement is to give all students firsthand experience with some of the differences in structure and usage of languages and the several issues involved in the learning of second languages. This requirement can be satisfied by demonstrating satisfactory proficiency, by prior study in a language (e.g., two years of high school study), or by satisfactory completion of one quarter of study in a language course approved by the department.
  5. **Cognitive Science 200 Seminar.** Students must enroll in this seminar for at least three quarters by the end of the third year; participation thereafter is encouraged.
  6. **Advancement to Candidacy/Qualifying Paper and Oral Exam.** There are three components to advancement to candidacy:
    - a. **Competency.** This requirement is met by satisfactorily completing items 1-5 above.
    - b. **Depth.** This requirement is met by satisfactorily completing an integrative paper that focuses on three to seven important readings covering two of the three areas of brain, behavior, and computation.
    - c. **Dissertation Topic.** The student prepares a proposal of the dissertation topic that must be approved by the student's dissertation committee. A written proposal is submitted to the committee at least two weeks prior to an oral defense of the proposal. The doctoral committee consists of at least five

faculty members: three from the department and two from outside the department; one of the outside members must be tenured.

7. **Teaching (Cognitive Science 500).** All graduate students must serve as a teaching assistant each year while in residence (usually one course per year). The undergraduate program offers a special challenge to instructor and student alike, and experience with the teaching of that program can provide a valuable part of the education of a cognitive scientist. The department works closely with the Center for Teaching Development to design effective training and development programs for its teaching assistants. At the end of each quarter, instructors prepare written evaluations of all teaching assistants.
8. **Participation in Departmental Events and Committees.** Students participate in departmental special events and committees and serve as student representatives for faculty meetings, the graduate admissions committee, and the campus-wide Graduate Student Association.
9. **Completion of the Ph.D. Dissertation and Defense.** Candidates prepare a written dissertation demonstrating a substantive contribution to our understanding of cognition. An oral defense follows.

**MASTER'S DEGREE**

Candidates for the Ph.D. may be granted the M.S. degree after fulfilling the first three requirements listed above. This is usually at the end of the second year.

**EVALUATION OF PERFORMANCE AND PROGRESS**

A formal evaluation of performance and progress for all students takes place at the end of spring quarter every year, with special attention given to the first and second years of study and at the time of qualification. The first-year evaluation is based in large part on the performance in foundations and issues courses. The second-year evaluation is based on the student's total performance, with heavy weight given to the student's second-year research project. The third-year evaluation focuses on the competency and depth requirements, and the fourth year on the progress made toward completion of the dissertation.

**SPECIAL EVENTS**

The department intends to enhance the student-faculty interaction and current awareness of active research issues by special "events":

- Lectures by invited speakers or faculty members.

- A full day of faculty/student overview and information at the start of each year, with emphasis on ongoing research activity.
- Presentations of second-year research projects to the entire faculty at the end of each year.
- Final defense of the dissertation accompanied by a public lecture and celebration.

### TIME LIMITS TO PH.D.

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed seven years. Total registered time at UCSD cannot exceed eight years.

### FINANCIAL AID

Financial support is available to qualified students in the form of fellowships, loans, and assistantships.

## THE INTERDISCIPLINARY PH.D. PROGRAM

### FACULTY

#### Professors

- Norman H. Anderson, Ph.D., *Psychology*  
 Richard C. Atkinson, Ph.D., *Cognitive Science and Psychology*  
 Elizabeth Bates, Ph.D., *Cognitive Science and Psychology*  
 Patricia S. Churchland, B.Phil., *Philosophy*  
 Paul M. Churchland, Ph.D., *Philosophy*  
 Aaron Cicourel, Ph.D., *Sociology*  
 Michael Cole, Ph.D., *Communication and Psychology*  
 Roy G. D'Andrade, Ph.D., *Anthropology*  
 Jeffrey L. Elman, Ph.D., *Cognitive Science and Linguistics*  
 Yrjö Engeström, Ph.D., *Communication*  
 Gilles Fauconnier, Ph.D., *Cognitive Science*  
 Philip M. Groves, Ph.D., *Psychiatry*  
 Steven A. Hillyard, Ph.D., *Neurosciences*  
 Patricia W. Kitcher, Ph.D., *Philosophy*  
 Edward S. Klima, Ph.D., *Emeritus, Linguistics*  
 Marta Kutas, Ph.D., *Cognitive Science and Neurosciences*  
 Ronald W. Langacker, Ph.D., *Linguistics*  
 George Mandler, Ph.D., *Psychology*  
 Jean M. Mandler, Ph.D., *Cognitive Science*  
 Hugh B. Mehan, Ph.D., *Sociology*  
 Helen J. Neville, Ph.D., *Cognitive Science*  
 Donald A. Norman, Ph.D., *Cognitive Science*  
 David M. Perlmutter, Ph.D., *Linguistics*  
 Vilayanur S. Ramachandran, Ph.D., M.B.B.S., *Psychology*  
 Walter Savitch, Ph.D., *Computer Science and Engineering*  
 Terrence J. Sejnowski, Ph.D., *Biology*

- Allen I. Selverston, Ph.D., *Biology*  
 Larry R. Squire, Ph.D., *Psychiatry*  
 David Zipser, Ph.D., *Cognitive Science*

#### Associate Professors

- Gerald J. Balzano, Ph.D., *Music*  
 Edwin L. Hutchins, Ph.D., *Cognitive Science*  
 Carol Padden, Ph.D., *Communication*  
 Harold E. Pashler, Ph.D., *Psychology*  
 Joan Stiles, Ph.D., *Psychology*  
 Stuart Zola-Morgan, Ph.D., *Psychiatry*

#### Assistant Professors

- Farrell Ackerman, Ph.D., *Linguistics*  
 Philip E. Agre, Ph.D., *Communication*  
 John D. Batali, Ph.D., *Cognitive Science*  
 Richard K. Belew, Ph.D., *Computer Science and Engineering*  
 Garrison W. Cottrell, Ph.D., *Computer Science and Engineering*  
 Charles P. Elkan, Ph.D., *Computer Science and Engineering*  
 Judith C. Goodman, Ph.D., *Psychology*  
 Suzanne Kemmer, Ph.D., *Linguistics*  
 David Kirsh, D.Phil., *Cognitive Science*  
 Paul Kube, Ph.D., *Computer Science and Engineering*  
 Jaime A. Pineda, Ph.D., *Cognitive Science*  
 Mark St. John, Ph.D., *Cognitive Science*

#### Adjunct Professors

- Ursula Bellugi, Ed.D., *Psychology*  
 Francis H. C. Crick, Ph.D., *Biology*

The interdisciplinary Ph.D. program is distinct from the departmental Ph.D. program (see previous section) both in admissions and graduation requirements. There are four aspects to graduate study in the interdisciplinary program: (a) a *primary specialization* in one of the established disciplines of cognitive science; (b) a *secondary specialization* in a second field of study; (c) familiarity with general issues in the field and the various approaches taken to these issues by scholars in different disciplines; and (d) an original dissertation project of an interdisciplinary character. The degree itself reflects the interdisciplinary nature of the program, being awarded jointly to the student for studies in cognitive science and the home department. Thus, students in linguistics or psychology will have degrees that read "Ph.D. in Cognitive Science and Linguistics" or "Ph.D. in Cognitive Science and Psychology."

### ADMISSION TO THE PROGRAM

Students enter UCSD through admission to one of the affiliated departments, which then serves as their *home department* and which specifies their primary specialization. The affiliated departments are: anthropology, communication,

computer science and engineering, linguistics, neurosciences, philosophy, psychology, and sociology. Students may apply for admission to the interdisciplinary program at the same time they apply to the home department or after entering UCSD. Students must have an adviser from their home department who is a member of the interdisciplinary program faculty. If a student does not have such an adviser, a member of the Instructional Advisory Committee will be appointed as interim adviser. The Instructional Advisory Committee is made up of one interdisciplinary program faculty person from each of the home departments. The committee member that will serve as interim adviser for a student will come from the same home department as the student.

### PRIMARY SPECIALIZATION

Primary specialization is accomplished through the home department. Students are expected to maintain good standing within their home departments and to complete all requirements of their home departments through qualification for candidacy for the Ph.D. degree.

### SECONDARY SPECIALIZATION

The power of an interdisciplinary graduate training program lies in large measure in its ability to provide the student the tools of inquiry of more than one discipline. Students in the cognitive science interdisciplinary program are expected to gain significant expertise in areas of study outside of those covered by their home departments. Such expertise can be defined in several ways. The second area might coincide with that of an established discipline, and study within that discipline would be appropriate. Alternatively, the area could be based upon a substantive issue of cognitive science that spans several of the existing disciplines, and study within several departments would be involved. In either case, students work with their adviser and the Instructional Advisory Committee to develop an individual study plan designed to give them this secondary specialization. This requirement takes the equivalent of a full year of study, possibly spread out over several years. Often it is valuable to perform an individual research project sponsored by a faculty member in a department other than the student's home department.

The following list demonstrates some ways to fulfill the secondary specialization requirement. It should be emphasized that these programs are only examples. Students will devise individual plans by working with their advisers and the advisory committee. Ideally, students who elect to do research in their areas of secondary interest will be able to accomplish a substantive piece of



work, either one of publishable quality or one that will be of significant assistance in their dissertation projects.

**Cognitive Psychology.** Get a basic introduction to cognitive psychology through the Cognitive Psychology Seminar (218A and 218B) and acquire or demonstrate knowledge of statistical tools and experimental design (this can be done either by taking the graduate sequence in statistics, Psychology 201A and 201B, or through the standard "testing out" option offered to all psychology graduate students). Finally, and, perhaps of most importance, the student should do a year-long project of empirical research in psychology with the guidance of a member of the Department of Psychology.

**Cognitive Social Sciences.** A course sequence from sociology and anthropology, including one or two courses in field methods and a research project under the direction of a cognitive social sciences faculty member. The course sequence and project should be worked out with the advisory committee to reflect the interests and background of the student. Examples of courses include Anthropology 218 (Cognitive Anthropology), Cognitive Science 234 (Individual and Socially Distributed Cognition) and 254 (Pragmatics and Common Sense Reasoning), Psychology 216 (Seminar in Comparative Cognitive Research) and Sociology 204 (Text and Discourse Analysis), 240 (Ethnomethodology), and 241 and 242 (Cognitive and Linguistic Aspects of Social Structure). In addition, courses on field methods are offered by both anthropology and sociology.

**Computer Science and Artificial Language.** This specialization requires a thorough background in computer science. For those who enter the program without much formal training in this area, the secondary specialization in computer science includes some upper-division undergraduate courses (CSE 161A-B, 162, 165) and a minimum of two graduate courses (CSE 278A-B). (Note that these courses require basic knowledge of programming and discrete mathematics areas that may require some additional undergraduate courses for those who lack these skills.) Students with stronger backgrounds in computer science may go straight to graduate courses. For all students interested in this specialization, the course sequences and any projects should be worked out on an individual basis with the student's adviser.

**Discourse Structure and Processing.** This specialization is highly interdisciplinary, spanning linguistics, computer science, psychology, sociology, philosophy, and anthropology. Research within this specialization depends upon which discipline is given emphasis. Therefore,

the specialization will have to be developed according to the interests of the student. All students will have to demonstrate awareness and knowledge of relevant studies and the approaches of the various disciplines.

**Linguistics.** Students may take one course in syntax (Linguistics 221), one course in phonology (Linguistics 211), plus two additional courses in syntax or semantics. Alternatively, they may take two courses in phonetics/phonology (Linguistics 210, 211), one course in syntax (Linguistics 221), plus one additional course in phonology. In addition, they will prepare a research paper (preferably originating in one of the above courses) that demonstrates control of the methodology and knowledge of important issues in the field.

**Neurosciences.** A student specializing in neurosciences would take a program of courses emphasizing brain-behavior relationships, including Behavioral Neuroscience (NS 264) and Physiological Basis of Human Information Processing (NS 243). In addition, depending upon the student's individual interests, one or more of the neurosciences core courses would be taken in the areas of Neurophysiology (NS 262), Mammalian Neuroanatomy (NS 256), Neuropsychopharmacology (NS 277), and/or Neurochemistry (NS 234). In most cases, the student would also take a research rotation in the laboratory of a member of the neurosciences faculty.

**Philosophy.** Students who elect a secondary specialization in philosophy will focus on philosophy of science, philosophy of mind, philosophy of psychology, philosophy of neuroscience, or philosophy of language, depending on their area of primary specialization. Courses suitable for this program include: 212 Contemporary Topics in the Philosophy of Science, 235 Philosophy of Language, 270 Contemporary Epistemology and Metaphysics, 272 Theory of Knowledge, 274 Philosophy of Mind, and 285 Seminar on Special Topics, which will frequently focus on issues relevant to cognitive science. The course sequence should be worked out with the student's adviser.

### ACQUISITION OF PERSPECTIVE ON THE FIELD

The cognitive science faculty offers a special seminar, Cognitive Science 200, that emphasizes the interdisciplinary approach to the field and that covers a variety of different problems, each from the perspective of several disciplines. All students are required to enroll in this seminar a total of six quarters while in residence; most students regularly attend the seminar even after fulfilling the requirement.

### PREQUALIFYING EXAMINATIONS

Students must complete any prequalifying and field requirements of their home department.

### QUALIFYING EXAMINATIONS

**The dissertation advisory committee.** As soon as possible, students form a dissertation committee consisting of:

At least three members from the student's home department, including the student's adviser; and at least three members of the Cognitive Science Program, at least two of whom are not members of the student's home department.

University regulations require that at least one of the faculty members of the committee from outside the home department be tenured. The committee must be approved by the interdisciplinary program, the home department, and by the dean of Graduate Studies. The dissertation committee is expected to play an active role in supervising the student and to meet with the student at regular intervals to review progress and plans.

In the qualifying examination, the student must demonstrate familiarity with the approaches and findings from several disciplines relevant to the proposed dissertation research and must satisfy the committee of the quality, soundness, originality, and interdisciplinary character of the proposed research.

### INTERDISCIPLINARY DISSERTATION

It is expected that the dissertation will draw on both the primary and secondary areas of expertise, combining methodologies and viewpoints from two or more perspectives, and that the dissertation will make a substantive contribution to the field of cognitive science.

### OVERVIEW

The program can be summarized in this way: In the first years, basic training within the student's primary specialization provided by the home departments;

In the middle years, acquisition of secondary specialization and participation in the Cognitive Science Seminar;

In the final years, dissertation research on a topic in cognitive science supervised by faculty from the program.

**Time limits.** Normative time and time limits for precandidacy, financial support, and registration are those established for the home department.



## Courses

### LOWER DIVISION

#### 10A-B-C. Minds, Brains, and Computers (4-4-4)

This sequence covers classical and fundamental questions of mind and intelligence, including the relations among minds, brains, and computers. (May fulfill minor, program of concentration, and general-education requirements; see an academic adviser in your college.)

#### 14. Logic and Statistics (4)

Introductory logic: propositional logic, predicate logic, some modal and nonmonotonic logic (including truth tables, inference rules, elementary proofs, variables and quantifiers, and modal operators). Introductory statistics: mean chi square, T tests, hypothesis testing, dependent and independent variables, and analysis of variance.

#### 16. Lower-Division Seminar on Special Topics (1-4)

Discussion of special topics in cognitive science. May be repeated when topics vary.

#### 17. Neurobiology of Cognition (4)

Introduction to the organization and functions of the nervous system. Topics include molecular, cellular, developmental, systems, and behavioral neurobiology. Specifically, structure and function of neurons, peripheral and central nervous systems, sensory, motor, and control systems, learning and memory mechanisms. This course may fulfill college general-education requirements. Students may not receive credit for both Biology 12 and Cognitive Science 17.

#### 18. LISP and Symbolic Programming (4)

The Common LISP interpreter and environment. Functions, variables, and recursion. Predicates and control structures. Lists, arrays, and structures. Symbolic programming. The use of LISP in artificial intelligence. Laboratory work involves creating, modifying, testing, and debugging LISP programs.

#### 90. Undergraduate Seminar (1)

An introduction to issues and contemporary research in cognitive science.

### UPPER DIVISION

#### 101A-B-C. Fundamental Cognitive Phenomena (4-4-4)

This sequence acquaints students with fundamental cognitive phenomena and the methods used to study them. Phenomena considered include sensation and perception, attention, learning, memory, reasoning, problem solving, grammar, semantics, cognitive development, and the relation of language and culture to cognition. *Prerequisites: Mathematics 1C or 2C, and Cognitive Science 14 or Psychology 60 plus Philosophy 10 or Mathematics 183 plus Philosophy 10.*

#### 107A-B-C. Cognitive Neuroscience (4-4-4)

This sequence covers basic anatomy and physiology of the animal and human nervous system, including development and evolution. Clinical and experimental measures of cognitive performance are discussed. A major emphasis is functional neuroscience: neurological mechanisms are examined in light of current understanding of their function, of the phenomena to be explained, and of our understanding of the constraints on computational mechanisms. *Prerequisites: Mathematics 1C or 2C, Cognitive Science 14 or Psychology 60 plus Philosophy 10 or Mathematics 183 plus Philosophy 10, and Biology 12 or Cognitive Science 17.*

#### 108M. Modeling Cognitive Phenomena—Methods (4)

This course will teach the C and LISP programming languages, with particular emphasis on techniques that are relevant for cognitive science. *Prerequisites: Computer Science and Engineering 62B or 65, Mathematics 1C or 2C, and Cognitive Sci-*

*ence 14 or Psychology 60 plus Philosophy 10 or Mathematics 183 plus Philosophy 10.*

#### 108A. Modeling Cognitive Phenomena—Artificial Intelligence (4)

This course covers the principles of formal specification, representation, and control both at an abstract theoretical level and more concretely by examining specific models. Special emphasis is placed on computational models of thought and memory. Must be taken concurrently with Cognitive Science 108AL. *Prerequisites: Cognitive Science 18, Mathematics 1C or 2C, and Cognitive Science 14 or Psychology 60 plus Philosophy 10 or Mathematics 183 plus Philosophy 10.*

#### 108AL. Modeling Cognitive Phenomena—Artificial Intelligence Lab (2)

A hands-on modeling course in which the programming language LISP will be used to construct computational models of thought and memory. Must be taken concurrently with Cognitive Science 108A. *Prerequisites: Cognitive Science 18, Mathematics 1C or 2C, and Cognitive Science 14 or Psychology 60 plus Philosophy 10 or Mathematics 183 plus Philosophy 10.*

#### 108P. Modeling Cognitive Phenomena—Parallel Distributed Processing (4)

This course is an elementary introduction to neural networks and their use in cognitive science. Students will learn how to construct and train neural networks to solve problems at both the psychological and neurological levels of cognition. (Course previously offered as Psychology 188A, Cognitive Science 188A, and Cognitive Science 108B.) *Prerequisites: Cognitive Science 18 and Mathematics 1C or 2C.*

#### 113. Cognitive Development (4)

An examination of the foundations and growth of mind, discussing the development of perception, imagery, concept formation, memory, and thinking. Emphasis is placed on the representation of knowledge in infancy and early childhood. (Credit may not be received for both Psychology 136 and Cognitive Science 113.) *Prerequisite: Cognitive Science 101B or Psychology 105 or Psychology 101.*

#### 130. Everyday Cognition (4)

This course examines memory, reasoning, language understanding, learning, and planning directly in everyday, real-world settings. The course work includes discussions of both the findings and the methodology of naturalistic studies of cognition.

#### 131. Distributed Cognition (4)

This is a continuation of Cognitive Science 130. Cognition extends beyond the boundaries of the person to include the environment, artifacts, social interactions, and culture. Major themes are the study of socially distributed cognition and the role of artifacts in human cognition. *Prerequisite: Cognitive Science 130.*

#### 132. Cognitive Engineering (4)

Applications of cognitive science are explored, emphasizing principles for the design of intelligent systems focusing on human-machine interaction, whether the users be individuals, groups, or organizations. An extensive project analyzing an existing system or product or designing a new application is required. (This course was previously offered as Psychology 135, Cognitive Engineering. Students who have already taken Psychology 135 may not receive credit for Cognitive Science 132. They may, however, take and receive credit for Cognitive Science 130 and Cognitive Science 131.) *Prerequisite: Cognitive Science 131.*

#### 141. Observation, Protocol, and Discourse Analysis (4)

The observation of human problem solving in natural settings and the role of written and oral protocols and discourse in the way decisions are reached. Several exercises will introduce students to observational methods and the analysis of speech

events and written documents. *Prerequisite: Psychology 60 or Mathematics 183 or equivalent.*

#### 150. Semantics (4)

Meaning, reasoning, and understanding: a study of the ways in which natural language reflects complex human thinking processes.

#### 153. Language Comprehension (4)

This course explores the computations underlying language comprehension. The processes and representations involved in reading text—from processing words, syntax, and semantics to processing paragraphs—are examined in light of evidence from experimentation and connectionist computer modeling. Introductory cognitive science and programming are recommended.

#### 160. Upper-Division Seminar on Special Topics (1-4)

Discussion of special topics in cognitive science. May be repeated when topics vary.

#### 170. Natural and Artificial Symbolic Representational Systems (4)

This course compares the computer metaphor for cognition with one drawn from the study of biological symbol processing at the level of individual cells and studies how human symbol manipulation and interpretation have been modeled after artificial symbol processing machines. Cognitive Science 107A and 108M are recommended but not required prerequisites. *Prerequisites: Cognitive Science 17 or Biology 12 or Biology 1, Mathematics 1C or 2C, and Cognitive Science 18 or Computer Science and Engineering 62B or 65.*

#### 172. Brain Disorders and Cognition (4)

A review of the patterns of impaired and intact cognitive abilities present in brain-damaged patients in terms of damage to one or more components of a model of normal cognitive functioning. (Cognitive science majors who have already taken Psychology 139 may not receive elective credit for Cognitive Science 172.) *Prerequisite: Cognitive Science 107A.*

#### 179. Electrophysiology of Cognition (4)

Survey of theory and practice of using recordings of the electrical and magnetic activity of the brain to study cognition and behavior. Explorations of what brain waves reveal about normal and abnormal perception, processing, decision making, memory, preparation, and comprehension. *Prerequisites: Cognitive Science 107A, and Cognitive Science 101A or Psychology 105.*

#### 181. Advanced Parallel Distributed Processing Modeling (4)

Advanced study of parallel distributed processing models of cognitive systems (also known as neural networks). (Course previously offered as Psychology 188B, Cognitive Science 188B, and Cognitive Science 108C.) *Prerequisite: Cognitive Science 108P.*

#### 182. Advanced Artificial Intelligence Modeling (4)

Advanced study of artificial intelligence models of control and representation. (Course previously offered as Cognitive Science 108D.) *Prerequisites: Cognitive Science 108A and 108AL.*

#### 190A-B-C. Projects in Cognitive Science (4-4-4)

This sequence is for advanced students who wish to undertake a two- or three-quarter long research project. Projects may be in any of the various areas in cognitive science. *Prerequisites: Biology 12 or Cognitive Science 17, Mathematics 1C or 2C, Cognitive Science 14 or Psychology 60 plus Philosophy 10 or Mathematics 183 plus Philosophy 10, and Cognitive Science 18 or Computer Science and Engineering 62B or 65.*

#### 195. Introduction to Teaching Cognitive Science (4)

Students, under the direction of the instructor, lead laboratory or discussion sections, attend lectures, meet regularly with the instructor to help prepare course materials, and grade papers and exams. Applications must be submitted to and approved by

the department. *Prerequisites: upper-division standing, 3.0 GPA, and department consent.*

**198. Directed Group Study (2 or 4)**

This course involves reading or a research project by special arrangement between a faculty member and a small group of students. *Prerequisites: upper-division standing and consent of instructor.*

**199. Special Project (4)**

Independent reading or research project by special arrangement with a faculty member. *Prerequisites: upper-division standing and consent of instructor.*

**GRADUATE**

**200. Cognitive Science Seminar (4)**

A seminar offered by the Cognitive Science Group faculty emphasizing the conceptual bases of cognitive science, including problems of representation, processing mechanisms, language, and the role of interaction among individuals, culture, and the environment. Current developments in each field are considered as they relate to broad issues of general interest in cognitive science. May be repeated for credit.

**201A-B-C-D-E-F. Foundations of Cognitive Science (4-4-4-4-4-4)**

Cognitive phenomena and the basic skills and tools to deal with them: computation, artificial intelligence, parallel distributed processing, formal logic and grammars, neuro-modeling, neurobiological basis of cognitive processes, cognitive semantics and pragmatics, social cognition, language, representations, development, and learning. *Prerequisite: admission to the cognitive science Ph.D. program or consent of instructor.*

**203A-B-C. Introduction to Research (4-4-4)**

Intensive, active research on a topic selected by the student and adviser. The student does a thorough analysis of the problem and of the research literature; carries out new, original studies of problems in the area; and prepares a formal report for both oral and written presentation at the end of the spring quarter. The students should aim for a report of publishable quality. The course is required of all second-year students in the department. *Prerequisite: admission to the cognitive science Ph.D. program or consent of instructor.*

**204A-B. Research Methods in Cognitive Science (4-4)**

This course provides an overview of research methods in cognitive science. Issues in design, implementation, and evaluation of research are discussed. Students present and comment on their own research projects in progress during the two-quarter sequence. *Prerequisite: admission to the cognitive science Ph.D. program or consent of instructor.*

**213. Issues in Cognitive Development (4)**

An examination of current issues in human development of interest to cognitive scientists. Emphasis is placed on the foundations of mind and the types of information that are represented at various stages of development.

**231. Cognition and Action (4)**

Studies of cognition in the real world, where perception, knowledge, intention, and action form a closed cycle of events. Extensive analysis of "everyday cognition" and a consideration of application, especially to the theory of the design of cognitive artifacts.

**234. Individual and Socially Distributed Cognition (4)**

Course will focus on aspects of individual and socially distributed cognition associated with reasoning and decision making under conditions of uncertainty. Empirical examples will be drawn from natural and experimental settings which presuppose, tacitly or explicitly, socially distributed knowledge among the participants. The class will examine the way locally managed, pragmatic conditions influence how decisions are framed.

**251. Aphasia (4)**

A survey of research and theory on language breakdown in brain-damaged adults. Includes a historical overview (from Broca through Geschwind), followed by contemporary theory and evidence from linguistics, psycholinguistics, and neuroscience (especially brain-imaging techniques).

**253. Semantics and Cognition (4)**

This course explores the cognitive organization that lies behind natural language production and understanding.

**254. Pragmatics and Common Sense Reasoning (4)**

A study of the pragmatic principles involved in language comprehension and the logic of everyday life. Cognitive, linguistic, cultural, and sociological aspects will be covered.

**260. Seminar on Special Topics (1-4)**

Discussion of specific topics in cognitive science. May be repeated when topics vary.

**270A-B-C. Seminar in Cognitive Neuroscience (2-2-2)**

This year-long seminar will provide a broad overview of the emerging field of cognitive neuroscience—the multidisciplinary study of the neural bases of higher cognitive functions, including perception and attention, sensory plasticity, learning and memory, cerebral specialization, and language.

**272. Topics in Theoretical Neurobiology (4)**

The main focus of this course is the relationship between nervous system function and cognition. It covers broad theoretical issues and specific topics. Material comes from lecturers, papers, and the text. Topic varies each time course is offered. May be repeated for credit.

**273. Biological Basis of Attention (4)**

A survey of the research and theories of attention with special emphasis on the current anatomical, physiological, and biochemical basis of attention.

**275. Visual Modeling (4)**

Current approaches to modeling visual function. The course concentrates on models with a degree of neural realism, but traditional artificial intelligence approaches are also covered. Students will prepare a project.

**283. Evaluating Cognitive Models (4)**

Computer models bear a variety of relationships to cognitive evidence, from descriptive statements to detailed, working process models. This course explores the theory and practice of computer simulation through readings and hands-on experience by developing and evaluating models of cognitive processes.

**290. Cognitive Science Laboratory Rotation (2)**

Laboratory rotations provide students with experience in the various experimental methods used in cognitive science. *Prerequisite: consent of instructor.*

**298. Directed Independent Study (1-12)**

Supervised study and research of selected topics under the direction of a member of the faculty.

**299. Thesis Research (1-12)**

Directed research on dissertation topic.

**500. Teaching Apprenticeship (1-4)**

Teaching practicum for graduate students.

**Professors**

Michael Cole, Ph.D.  
Yrjö Engeström, Ph.D.  
Helene Keyssar, Ph.D.  
Chandra Mukerji, Ph.D.  
Herbert I. Schiller, Ph.D., *Emeritus*  
Michael Schudson, Ph.D.

**Associate Professors**

Susan G. Davis, Ph.D.  
Dee Dee Halleck  
Daniel Hallin, Ph.D.  
Robert Horwitz, Ph.D.  
Carol Padden, Ph.D.  
Vicente Rafael, Ph.D.  
Daniel Schiller, Ph.D.  
Harley Shaiken, B.A.

**Assistant Professors**

Philip E. Agre, Ph.D.  
Valerie Hartouni, Ph.D.  
William Drake, Ph.D.  
Olga A. Vasquez, Ph.D.

**Lecturer with Security of Employment**

Claudio Fenner-Lopez, M.A.

Communication at UCSD is a field of study which emphasizes the role of different technologies of communication, from language to television, in mediating human experience. It draws from such social science disciplines as anthropology, psychology, sociology and political science, and from the humanities and fine arts, including theatre, literature, and visual arts. Communication students will develop a critical awareness of the communicative forces which affect their everyday lives. Though the emphasis of the major is not a technical one, the faculty in the Department of Communication believes that students will develop a deeper understanding of how communication works by exploring firsthand the capabilities and limitations of a variety of media; students, therefore, will have the opportunity to conduct part of their studies in video, writing, theater performance, or computer communication.

The communication major is not designed as a training program in advertising, journalism, production, or public relations. It provides students with a solid liberal arts background necessary for graduate studies in communication and other disciplines, and for professional work in a number of communication-related fields.

The communication major offers an excellent preparation for teaching in the elementary and secondary level schools. If you are interested in earning a California teaching credential from UCSD, contact the Teacher Education Program for information about the prerequisite and professional preparation requirements. It is recom-

**COMMUNICATION**

OFFICE: 127 Media Center Communication Building, Third College  
(619) 534-4410

mended that you contact TEP as early as possible in your academic career.

To gain a deeper understanding of the communicative forces that affect their everyday lives, students will have the opportunity to explore a variety of media, including video, print, performance, or computer-communication media. We recommend that students interested in film and video production review requirements for the media production major offered through the Department of Visual Arts. We suggest that students who wish to develop their writing abilities review the listing for the literature/writing major and minor offered through the Department of Literature.

Within the communication department curriculum are three broadly defined areas of study: Communication as a Social Force, Communication and Culture, and Communication and Human Information Processing. Students take courses in each of these areas.

### **COMMUNICATION AS A SOCIAL FORCE**

How are social systems affected by communication technology? What is the social organization of the communication industries? How is the information presented by the media related to the characteristics of the intended audiences? How do media fit into the power structure of societies? Courses in this area address such questions. Students analyze mass communications, the development of communication technologies, and the political economy of mass communications both at home and abroad.

### **COMMUNICATION AND CULTURE**

Film, music, advertising, art, theater, ritual, literature, and language are forms of communication which embody cultural beliefs of the societies from which they come. These media can influence and bring about changes in social behavior, styles, and traditions. At the same time, individuals and groups can reshape the media. Students will study the social production of cultural objects, the cultural traditions that shape their form and content, and various approaches to interpreting or "reading" television, film, newspapers, language, rituals, and other forms.

### **COMMUNICATION AND HUMAN INFORMATION PROCESSING**

How do people turn concepts and ideas into messages? What is the process by which people receive and respond to those messages? Each medium—whether it is language, writing, or

electronic media—has different properties that change the way people create and comprehend messages. The impact of television on the individual, the effect of literacy on individuals and on cultures, the ways that concepts are transmitted in film, and the means by which computers expand communication potentials are examples of topics investigated in this area.

## **THE COMMUNICATION MAJOR**

Degree offered: Bachelor of Arts

The major consists of two lower-division courses and fourteen upper-division courses. None of the major courses may be taken on a Pass/No Pass basis.

### **LOWER DIVISION**

- \*Com/Gen 20: Introduction to Communication
- \*Com/Gen 21: Methods of Media Production

### **UPPER DIVISION**

- \*Com/SF 100: Introduction to Communication as a Social Force
- \*Com/Cul 100: Introduction to Communication and Culture
- \*Com/HIP 100: Introduction to Communication and Human Information Processing
- \*Com/Gen 150: Integrative Seminar in Communication

One media methods course: (to be selected from any communication course numbered 101–120)

Three courses beyond the introductory courses: (one must be chosen from each of the categories: Com/SF, Com/Cul, and Com/HIP)

Six upper-division communication electives (\*Com/Gen 100 required for all classes involving video production, P/NP only).

### **RESIDENCY REQUIREMENT**

Com/Gen 20, Com/Gen 21, Com/Cul 100, Com/Gen 100, Com/HIP 100, and Com/SF 100 must be taken at UCSD. Students must take at least ten classes of their overall major requirements at UCSD.

### **REQUIREMENTS FOR THE COMMUNICATION MINOR**

(Effective Fall 1987)

The communication minor at UCSD is a social science minor. None of the courses may be taken on a Pass/Not Pass basis. Students are required to take six courses in communication as follows:

- \*Com/Gen 20 (Introduction to Communication)

\*These courses must be taken at UCSD.

Two courses of your choice from the following:

- \*Com/SF 100 (Introduction to Communication as a Social Force)
- \*Com/Cul 100 (Introduction to Communication and Culture)
- \*Com/HIP 100 (Introduction to Communication and Human Information Processing)

Three upper-division communication electives within the areas of the chosen 100 classes.

Note: Com/Gen 100, Com/Gen 150, and Com/MP 122 may not be used as electives within the minor.

## **THE GRADUATE PROGRAM**

The Department of Communication seeks to combine modes of analysis from the humanities and social sciences to explore the history, structure, and process of communication. The graduate program is conceived as a blending of the tradition of critical communication research with the empirical tradition of American scholarship. The program does not closely resemble any other communication department in this country. Historically, this department grew out of an interdisciplinary program jointly sponsored by the Departments of Theatre, Political Science, Psychology, and Sociology. It is related by sympathy and interest to the mass communication programs, but not by kinship. The department retains strong ties to the departments and disciplines from which it developed.

The study of communication at UCSD places major emphasis on historical and comparative approaches to symbolically mediated human activity. The graduate curriculum is organized around three perspectives: 1. Communication as a Social Force, 2. Communication and Culture, and 3. Communication and the Individual. Communication as a Social Force deals with the history and political economy of mediated communication and the study of the media as social institutions. The department is particularly strong in the areas of telecommunications, regulation, and information studies. Special interests include the increasing importance of information and information technologies in American society and the global consequences of media practices. Communication and Culture involves the analysis of culture, using traditions from literature, folklore, history, sociology, and anthropology to focus on the social construction of interpretation and meaning. Special interests include the study of broadcast news, print journalism, commercial entertainment, and live performances as communicative systems. The department is particularly strong in the areas of popular culture, political

culture, and the relationship of nature to culture. Communication and the individual involves examination of the individual as socially constituted through language and other media. Special interests include computer-mediated interaction, the effects of specified media practices on individual consciousness, and the language and culture of the deaf community. The program also emphasizes a production component in which students test theory in practical implementations. Some faculty and student interests bridge the components of the curriculum. Faculty research interests that do so include Soviet concepts of person and mind, communication and collective memory; relations of language, power and culture; gender and cultural forms; telecommunications and information studies and communication and technology in the work place.

### PH.D. REQUIREMENTS

1. Communication 200A-B-C (Introduction to the Theory of Communication as a Social Force, Communication and Culture, and Communication and the Individual).
2. Communication 294, The History of Communication Research.
3. At least three methods courses from the 201 sequence (see course listings).
4. Four courses in communication history and theory (see course listings).
5. Communication 280, Advanced Workshop in Communication Media.
6. Communication 296, Communication Research as an Interdisciplinary Activity.
7. First-Year Evaluation: At the end of the spring quarter of the student's first year, the student must pass a comprehensive written examination based on course work completed during the first year.
8. Language Requirement: All students are required to demonstrate proficiency in one language other than their native language and in some second mode of communication. This second mode of communicative proficiency may be an additional language, a computer language, statistics, or demonstrated ability to work in a medium of communication other than speaking and writing (e.g., photography, film, dramatic production, or video).
9. Qualifying Examinations: Before the end of the fourth year the student must take and pass an oral qualifying examination. The exam will be based on two papers concerning two of the subfields covered in the program.
10. Teaching Requirement: In order to acquire teaching experience, all students are required to

participate in the teaching activities of the university for three academic quarters.

11. Dissertation: Acceptance of the dissertation by the university librarian represents the final step in completing all requirements for a Ph.D. The dissertation committee must be approved by the department chair and the dean of Graduate Studies.

### DEPARTMENTAL PH.D. TIME LIMIT POLICIES

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed seven years. Total registered time at UCSD cannot exceed eight years.

### STUDENT ADVISING

Faculty Graduate Adviser:  
Dan Schiller

Faculty Undergraduate Adviser:  
Yrjö Engeström

Student Services Coordinator:  
Gregory Griffin

Graduate Coordinator:  
Jamie Lloyd

## Courses

### LOWER DIVISION

#### ■ GENERAL COMMUNICATION

**Com/Gen 20. Introduction to Communication (4)**  
An historical introduction to the ways in which the means of communication structure human activity. In addition, the idea that the nature of communication is conditioned by the medium of communication will be explored in terms of major theories of information processing, interpersonal interaction, and political-economic power. Staff

**Com/Gen 21. Methods of Media Production (4)**  
This course explores fundamental technical and social constraints shaping media production: light, optics, electricity, news media technology, camera techniques, basic editing languages, and aesthetic standards affecting production decisions. Satisfactory completion of Com/Gen 21 is required to obtain a "media card." Keyssar

### UPPER DIVISION

#### ■ COMMUNICATION AS A SOCIAL FORCE

(Media methods courses are numbered 101-120.)

**Com/SF 100. Introduction to Communication as a Social Force (4)**  
A critical overview of areas of macro communication and analysis, with special emphasis on media persuasion and social effects. Considers critical and administrative communication the-

ories, the evolution of media delivery systems, and content and media research findings. *Prerequisite: Com/Gen 20.* Staff

**Com/SF 101A. Television Analysis and Production (6)**  
An introduction to the techniques and conventions common to the production of news, discussion, and variety-format television programs. Particular emphasis will be placed on the choice of camera "point of view" and its influence on program content. Laboratory sessions provide students the opportunity to experiment with production elements influencing the interpretation of program content. Concentration on lighting, camera movement, composition, and audio support. *Prerequisites: Com/SF 100 and Com/Gen 100 or consent of instructor.* Fenner-Lopez

**Com/SF 101B. Television Documentary (6)**  
An advanced television course which examines the history, form, and function of the television documentary in American society. Experimentation with documentary techniques and style requires prior knowledge of television or film production. Laboratory sessions apply theory and methods in the documentary genre via technological process. Integrates research, studio, and field experience of various media components. *Prerequisite: Com/SF 101A or consent of instructor.* Fenner-Lopez

**Com/SF 101C. Television as a Social Force (6)**  
Students will conduct simple field research and then make a series of documentary video tapes to present research in a television format. *Prerequisite: Com/SF 101B or consent of instructor.* Fenner-Lopez

**Com/SF 117. Political Drama as Communication (4)**  
This course will examine plays by black Americans, British and American women, and Asian dramatists in order to explore theater as a central mode of communication of and to particular political and ethnic communities. We will analyze and compare both historical and aesthetic problems that are particular to black dramatists and female dramatists in their attempts to accurately reflect and affect cultural values and behavior. Emphasis will be placed on black and feminist plays in twentieth-century America; the course will conclude with a brief study of modern theater in China as one attempt to communicate the values of a society through artistic form. *Prerequisite: Com/SF 100 or consent of instructor.* Staff

#### ■ COMMUNICATIONS

**Com/SF 120. The Transformation of Global Communications (4)**  
The information revolution has dramatically altered the telecommunications and information technologies and services which constitute the infrastructural nervous system of all international economic activity. This course is an introduction to the technical and market changes driving the emergence of a global information economy. Topics include the rise and decline of regulatory consensus; the development of new systems, services and markets; the growth of intangible, network-based transactions; the restructuring of corporate production and products; and the emergence of new international issues and conflicts. *Prerequisite: Com/SF 100 or consent of instructor.* Drake

**Com/SF 121. National Policies in Global Communications (4)**  
This course examines national policy responses to the transition to a global information economy. Topics include theories of the state and policymaking; and international telecommunications and information policies in the industrialized, developing, and communist countries. *Prerequisite: Com/SF 100, Com/SF 120, or consent of instructor.* Drake

**Com/SF 122. Multinational Policies in Global Communications (4)**  
This course examines the adaptation of international regulatory institutions negotiated by governments to the transition to a global information economy. Topics include the political economy of regime cooperation on telecommunications, satellite



systems, radio frequency allocations, transborder data flows, and trade in services. *Prerequisite: Com/SF 100 or Com/SF 120.* Drake

**Com/SF 124A-B. Public Opinion and Political Ideology (4-4)**

The structure, origins, and dynamics of public opinion and political ideology. Comm/SF 124A considers the nature of public opinion and the factors that shape the development of political ideas—economic interests, psychological functions, political communication and organization, etc. Comm/SF 124B examines the development of political ideas in specific historical situations. *Prerequisite: Com/SF 100 or consent of instructor.* Hallin

**Com/SF 126. The Information Age: In Fact and Fiction (4)**

Analysis of the forces propelling the "Information Age." An examination of the differential benefits and costs, and a discussion of the presentation in the general media of the "Information Age." *Prerequisite: Com/SF 100 or consent of instructor.* Staff

**Com/SF 128. Information Technology: Culture, Society, Politics (4)**

An analysis of recent developments in telecommunications and computer technologies, and the social impact of their melding into a new industrial complex. The examination will be situated within the debates over the so-called "postindustrial society." The impact of information technology on industry, work, skill, and stratification politics and culture will be considered. *Prerequisite: Com/SF 100 or consent of instructor.* Horwitz

**Com/SF 132. History of U.S. Political Communication (4)**

Survey of the history of political communication in the United States from the colonial period to the present. Students will work on term papers in which they will undertake original historical research. *Prerequisites: communication major, Com/SF 100, or consent of instructor.* Schudson

**Com/SF 139A-B. Law, Communication, and Freedom of Expression (4-4)**

An examination of the legal framework of the freedom of expression in the United States. Basic First Amendment law is analyzed through the consideration of key cases and decisions in historical context. A major focus is the law of mass communications, examining the different legal treatment accorded print, broadcasting, and common carriers. *Prerequisite: Com/SF 100 or consent of instructor.* Horwitz

**Com/SF 147. Information Technology and Global Production (4)**

Examines the role of computers, automation, and telecommunications on a new international division of labor. Analyzes the factors propelling and constraining the shifts of production between developed and developing countries, especially the role of labor relations, skill, industrial infrastructure, and trade policy. *Prerequisite: communication major or consent of instructor.* Shaiken

**Com/SF 148. Computers, Work, and Society (4)**

This course explores new ways in which information technology is used to reorganize the work place and its social impact. Examines different approaches to organizing work both historically and today, the social forces affecting technological development, and the economic forces reshaping industry and labor. *Prerequisite: Com/SF 100 or consent of instructor.* Shaiken

**Com/SF 149. Images of Work (4)**

Explores the portrayal of work in novels, film, and other media in the twentieth-century United States. The focus is on how ideas about work have been influenced by technology, economic forces, and social movements. *Prerequisite: Com/SF 100 or consent of instructor.* Shaiken

**Com/SF 150. Automobile and American Society (4)**

This course uses the basic perspectives of communication to analyze the impact of the development and use of the automobile on U.S. society. The course focuses on three interrelated areas: the development of mass production, mass consumption, and mass transportation. *Prerequisite: Com/SF 100, or consent of instructor.* Shaiken

**Com/SF 165. U.S. Soviet Communication in the Nuclear Age (4)**

This course examines some of the ways that the U.S. and the Soviet Union communicate with each other using face-to-face communication, the standard media, and new electronic techniques. Special emphasis is given to a particular topic or technique each quarter that the course is offered. *Prerequisite: Com/SF 100.* Staff

**Com/SF 171A-B. American News Media (4-4)**

(Same as Sociology 165 and Pol. Sci. 1021.) History, politics, social organization, and ideology of the American news media. SF 171A surveys the development of the news media as an institution, from earliest new newspapers to modern mass news media. SF 171B deals with special topics, including the nature of television news, and with methods of news media research, and requires a research paper. *Prerequisite: Com/SF 100 for Com/SF 171A; Com/SF 171A is required for Com/SF 171B.* Hallin

**Com/SF 175. Advanced Topics in Communication: Social Force (4)**

Specialized study in communication as a social force with topics to be determined by the instructor for any given quarter. May be repeated for credit three times. *Prerequisite: Com/SF 100 or consent of instructor.* Staff

**Com/SF 178. Mass Communications: Theories, Perspectives, and Methods (4)**

This course in communication theory and methodology looks at various major schools of thought concerning the role, power, and effects of mass communications in modern society. We examine how the traditional "media effects" literature, critical theory, uses and gratifications research, cultural studies research, semiotics, and hermeneutics. *Prerequisite: Com/SF 100 or consent of instructor.* Horwitz

**Com/SF 180. Political Economy of Mass Communications (4)**

The social, legal, and economic forces affecting the evolution of mass communications institutions and structure in the industrialized world. The character and the dynamics of mass communications in the United States today. *Prerequisite: Com/SF 100 or consent of instructor.* Staff

**Com/SF 181. Political Economy of International Communications (4)**

The character and forms of international communications. Emerging structures of international communications. The United States as the foremost international communicator. Differential impacts of the free flow of information and the unequal roles and needs of developed and developing economies in international communications. *Prerequisite: Com/SF 100 or consent of instructor.* Staff

**Com/SF 183. History of Communication Technologies (4)**

This course will cover the development of the major mass communications technologies: printing, photography, telegraph and telephone, film, radio, and television. Particular attention will be paid to the telegraph/telephone and broadcast media because a major focus of the course is to analyze the relationship between communication technologies and macroeconomic structures. It is hypothesized that the telegraph/telephone fosters decisive organizational changes in the patterns of capitalist economic production; radio/television fosters decisive social changes in the patterns of consumption. Each of these technological developments will be analyzed in terms of broader pat-

terns of technological innovation in their respective periods of history. There will be some emphasis on the history and evolution of the American Telephone and Telegraph Company (AT&T). Finally, uses of these technologies will be analyzed for the changes in patterns of communication that they create. *Prerequisite: Com/SF 100 or consent of instructor.* Horwitz, Mukerji

**Com/SF 184. Media Analysis (4)**

A systematic study of the means of contemporary information processing in the advanced industrial state. Institutional approaches to and empirical studies of the processing of information will be explored. *Prerequisite: Com/SF 100 or consent of instructor.* Staff

**Com/SF 185. History of Book Publishing (4)**

This course will cover the history of book publishing from the development of printing in the fifteenth century to the present. Subjects covered will include the relative roles of (1) technology, (2) the organization of the publishing business, (3) the structure of the book trade, and (4) the activities of individual editors and publishers in shaping book production. *Prerequisite: Com/SF 100 or consent of instructor.* Mukerji

**Com/SF 186. Film Industry (4)**

A study of the social organization of the film industry throughout its history, addressing such questions as who makes films, by what criteria, and for what audience. The changing relationships between studios, producers, directors, writers, actors, editors, censors, distributors, audience, and subject matter of the films will be explored. *Prerequisite: Com/SF 100 or consent of instructor.* Mukerji

**Com/SF 190. The Information Commodity (4)**

Examination of major social institutions and processes of information production and distribution. Explores the growth of import of wage labor and market structures across unevenly developing corporate and governmental information sectors. New media and nontraditional information providers are stressed. *Prerequisite: Com/SF 100, upper-division SF class, or consent of instructor.* Schiller

**COMMUNICATION AND CULTURE**

(Media methods courses are numbered 101-120.)

**Com/Cul 100. Introduction to Communication and Culture (4)**

Processes of communication shape and are shaped by the cultures within which they occur. This course emphasizes the ways in which cultural understandings are constructed and transmitted via the variety of communication media available to members. A wide range of cultural contexts are sampled, and the different ways that available communication technologies (language, writing, electronic media) influence the cultural organization of people's lives are analyzed. *Prerequisite: Com/Gen 20 or consent of instructor.* Davis, Keyssar

**Com/Cul 105. Media Stereotypes (4)**

An examination of how the media present society's members and activities in stereotypical formats. Reasons for and consequences of this presentation are examined. Student responsibilities will be (1) participation in measurement and analysis of stereotype presentations, and (2) investigating techniques for assessing both cognitive and behavioral effects of such scripted presentations on the users of media. *Prerequisites: Com/Cul 100 and Com/Gen 100 or consent of instructor.* Hal-leck

**Com/Cul 108. Images of Women (4)**

An analysis of American stereotypes of women and their use in media images. Student involvement includes (1) reviewing literature on the sociology of sex-roles, (2) developing media portraits of women to serve as data for class analysis, and (3)



## COMMUNICATION

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writing final paper on the stereotypes employed in generating these portraits. *Prerequisites: Com/Cul 100 and Com/Gen 100 or consent of instructor.* Staff

### **Com/Cul 112. News Media Workshop (4)**

Designed for students working in student news organizations or off-campus internships or jobs in news, public relations, or public information. A workshop in news writing and news analysis. *Prerequisites: Com/Cul 100 and Com/Cul 173 (may be taken concurrently) or consent of instructor.* Schudson

### **Com/Cul 113. Theatre Text to Media Performance (6)**

This course will explore the relationships between theatre performance and video and film production of dramatic texts as communication. Beginning with a case study of one dramatic score and moving to a variety of short dramatic pieces, students will be expected to apply both creative and critical skills to scene study for theatre and film. This course will include consideration of such elements as space, pacing, continuity, choice and preparation of materials, improvisations and relationship to the audience. Students may emphasize one area, such as acting, dramaturgy or camera work, but all members of the class will take on at least two different performance-production tasks during the course. Seminar and workshop format. *Prerequisites: Com/Cul 100 (Com/Gen 100 strongly recommended) or consent of instructor.* Keyssar

### **Com/Cul 114. American Theatre on Film (4)**

Extensive examination of major plays from the modern American theatre that have been recorded on film or video. The class will study developing American dramatic themes. American drama as a central mode of communication of the American mythos, and the shaping of American theatre art as a unique twentieth-century cultural phenomenon. Students will attend film screenings and participate in scene presentations from the plays studied to facilitate discussion of these plays as performance. Discussions of the films as interpretations of the plays and comparison of live theatre and film as means of communicating the central strategies of American drama. *Prerequisites: Com/Cul 100 (Com/Gen 100 recommended) or consent of instructor.* Keyssar

### **Com/Cul 115. The Theatre of Private Life: Family and Friends (4)**

A close examination of theatre involving a concern for the nature of human interaction and personal interplay, as revealed by conflict within families or small groups. *Prerequisites: Com/Cul 100 (Com/Gen 100 recommended) or consent of instructor.* Keyssar

### **Com/Cul 116. Feminist Theatre Workshop (6)**

This course explores the relationship between dramatic production and theory in a feminist context. Examination of such questions as the nature of collaboration, gender as an aspect of role identity, sexual codes of behavior. This class will create, as an ensemble, a live dramatic production of feminist drama and collaborate on a video production. *Prerequisites: Com/Cul 100, Com/Gen 100. Majors only or consent of instructor.* Keyssar

### **Com/Cul 118. Oral History (4)**

Theories, questions, cases, and methods in oral history will be introduced through readings, lectures, and concrete practice in oral historical research. Topics will include the relationship between oral history and official history; oral history and social history, voices and stances of the speaker, stances of the ethnographer and politics of editing; recording and presenting of texts; what is social speech in the individual. *Prerequisite: Com/Cul 100, Com/Cul 127 or 128, or work in folk literature or history, or consent of the instructor.* Davis

### **Com/Cul 125. How to Read a Film (4)**

The purpose of this course is to increase our awareness of the ways we commonly interpret or make understandings from movies and to enrich and increase the means by which one can enjoy and comprehend movies. We will talk about movies and we will explore a range of methods and approaches to film in-

terpretation. Readings will emphasize major and diverse theorists, including: Bazin, Eisenstein, Cavell, and Mulvey. *Prerequisite: Com/Cul 100 or consent of instructor.* Keyssar

### **Com/Cul 127. Folklore and Communication (4)**

Folklore is an important variety of noncommercial communication in societies dominated by commercial media. A source of alternative understandings, folklore is characterized by particular styles, forms, and settings. This course introduces a wide range of folklore genres from different cultures and historical periods, including oral narrative, material folk arts, dramas, and rituals. We will pay special attention to the relation between expressive form and social context. Sources include folklore texts, ethnographies, performances on film and videotape, novels, autobiographies, and student observations and experiences. *Prerequisite: Com/Cul 100 or consent of the instructor.* Davis

### **Com/Cul 128. Folklore and Mass Media (4)**

Local personal, vernacular, and oral traditions coexist with and influence the mass-produced, mass-mediated culture of the late twentieth century. This course examines the history of this influence, using materials such as oral histories, life stories, urban legends, and soap operas to explore the conjunctions of folklore and commercially produced entertainments in everyday social life. *Prerequisite: Com/Cul 100 or consent of the instructor.* Davis

### **Com/Cul 129. Ritual to Spectacle (4)**

This course examines a broad range of public celebrations as communication. The general task is to define celebration and examine how and what it communicates. Specifically, how is celebration different from, and yet related to, other kinds of communicative events and media? Examples range from local festivals to national mass-mediated spectacles. *Prerequisites: completion of pre-major, Com/Cul 100. Majors only or consent of instructor.* Davis

### **Com/Cul 133. Work, Culture, and Communication (4)**

This course introduces the notion that labor and communication are conjoined social forces which powerfully determine culture and society. We will explore this conjunction and its relationship to society using materials and ideas drawn from mass communication research, labor history, anthropology, sociology, literature, and folklore. Topics will include the history of the shift to industrial production as a reorganization of work as a communication medium, industrial folklore and work culture, changing images of work and workers, scientific management as control of social communication, the role of communication technologies on workplaces and work processes. *Prerequisite: Com/Cul 100 or consent of the instructor.* Davis

### **Com/Cul 134. Communication, Politics, and Citizenship in America (4)**

(Same as Poli. Sci. 113A) The citizen, free enough and informed enough to make political choices, supported by democratic social institutions and representative political institutions, lies at the heart of democratic theory. But who is entitled to be a citizen? Are citizens adequately informed? Do social and political institutions make possible or stand in the way of their ability to express their needs and interests? This course will examine these questions, and changing theoretical and practical answers to them, from colonial times to the present. *Prerequisite: upper-division standing.* Schudson/Houston

### **Com/Cul 137. The Politics of Bodies (4)**

This course will explore the construction of gendered bodies and gendered sexuality in the late twentieth century, post-industrial culture(s). Through the use of fiction, film and theory as well as political, historical and media analysis, we will examine the contested terrain, including the race and class coding, of such issues as abortion, infertility, eating disorders, gender identity, and AIDS. *Prerequisite: Com/Cul 100 or Women's Studies 2A, B, or C.* Hartouni

### **Com/Cul 138. Feminist Theory (4)**

This class is designed to initiate students into the pleasures, pains, and perplexities of critical thinking about gender. We will survey a wide variety of thinkers and issues, consider some of the historical as well as contemporary debates within western feminist thought, and develop tools of analysis for future work. *Prerequisite: upper-division standing. Recommended: Women's Studies/Cultural Traditions 2A, B, or C.* Hartouni

### **Com/Cul 139. Reproductive Discourse and Gender (4)**

In this course we will examine as a problem of discourse and culture the controversies surrounding the development and use of the new technologies of human genetics and reproduction. Of particular interest will be the way in which these new technological practices and processes test, erode, or undermine traditional understanding of "human nature" and relationship while enforcing traditional understanding of gender. *Prerequisite: Com/Cul 137 or Women's Studies 2A, B, or C.* Hartouni

### **Com/Cul 144. Language and Society (4)**

This course deals with the socioeconomic forces affecting the evolution of standardization of language, bilingualism, diglossia, and language maintenance. These processes are studied particularly in relation to the Spanish and English language in the United States. *Prerequisite: Com/Cul 100 or consent of instructor.* Staff

### **Com/Cul 146. Culture and Thought (4)**

(Same as Psych. 146.) An examination of the major theories and relevant data concerning the way in which culturally organized experience influences the nature of thinking. Historical records, anthropological field reports, and experiments will be examined for the senses in which they are relevant to understanding presumed relations between culture and thought. Particular emphasis will be placed on the kinds of conclusions that can be supported by different kinds of data and on the shifting meaning of basic terms when one surveys different areas of research on this topic. *Prerequisite: Com/Cul 100 or Com/HIP 100.* Cole

### **Com/Cul 150. Critical Theory (4)**

In this course we will consider critical theories of politics, power, society, and discourse emerging from and addressing the second part of the twentieth century. Our focus will be Euro-American and our project, to theorize "capitalize-disciplinary" society and its production of subjects. *Prerequisite: Com/Cul 100 or consent of instructor.* Hartouni

### **Com/Cul 150G. Sound and Image (4)**

This course will explore the structure and strategies of oral and visual representations, in particular as they are organized into systems of meaning in film, television, and photography. Changes in the nature and function of imaging over time as well as interrelationships of sound and visual image will be explored. Narrative and point of view will be key concerns. *Prerequisite: Com/Cul 100 or consent of instructor.* Staff

### **Com/Cul 160. Visual Knowledge (4)**

(Same as Sociol. 173.) This course reviews ways that visual imagery contributes to our understanding of the world around us and ourselves. Students will consider uses of visual images in science, the mass media, and everyday life. *Prerequisite: Com/Gen 20 or Sociol. 1A or consent of instructor.* Mukerji

### **Com/Cul 161. Material Culture: Design and Social Process (4)**

(Same as Sociol. 176.) An investigation of the connections between material culture and the technical and social forces affecting its production and use. Analytic topics include dress, gardening, and urban planning. *Prerequisite: Com/Gen 20 or Sociol. 1A or consent of instructor.* Mukerji

### **Com/Cul 162. Popular Culture (4)**

(Same as Sociol. 162.) An overview of the historical development of popular culture from the early modern period to the present. Also a review of major theories explaining how popu-

lar culture reflects and/or affects patterns of social behavior. *Prerequisite: Com/Gen 20 or Sociol. 1A or consent of instructor. Mukerji*

**Com/Cul 169. Culture, Ideology, and Collective Memory (4)**

How do societies remember (and forget) the past and, through this process of collective memory, conceive their present? What stories are stored, who constructs them, and what purposes do they serve? Readings in the theory of ideology and close study of empirical cases. *Prerequisite: Com/Cul 100 or consent of instructor. Schudson*

**Com/Cul 170. Advertising and Society (4)**

(Same as Sociol. 164.) Advertising in historical and cross-cultural perspectives. Topics will include the ideology and organization of the advertising industry; the meaning of material goods and gifts in capitalist, socialist, and nonindustrial societies; the natures of needs and desires and whether advertising creates needs and desires; and approaches to decoding the messages of advertising. *Prerequisite: Com/Cul 100 or consent of instructor. Schudson*

**Com/Cul 174. Persuasion and Society (4)**

(Same as Sociol. 164J.) What is the role of messages intentionally designed to be persuasive in society? How are messages crafted, and what impact do they have? Specific domains of persuasive communication to be examined will vary from year to year, but will typically include commercial advertising, public information campaigns, propaganda, public relations, and schooling. This course integrates research from sociology, social psychology, rhetoric, and communication. *Prerequisite: upper-division standing or consent of instructor. Schudson*

**Com/Cul 175. Advanced Topics in Communication: Culture (4)**

Specialized study in communication and culture with topics to be determined by the instructor for any given quarter. May be repeated for credit three times. *Prerequisite: Com/Cul 100 or consent of instructor. Staff*

**Com/Cul 179. Colonialism and Culture (4)**

(Same as ETHN 144.) This course examines colonial narratives, slave accounts, essays, and stories by both colonizers and colonized. It also explores the issue of nationalism in determining the limits of colonialism among minority groups in the United States and in the Third World. *Prerequisite: upper-division standing. Rafael*

**Com/Cul 180. Cultures and Markets (4)**

What is the relationship between "culture"—those conventions that anchor ideas and practices about self and society—and the "market"—the site of exchange and the restless circulation of social energy? This course will introduce students to the symbolic and practical import of commodities in shaping everyday life. Students will be expected to do the assigned readings and keep ethnographic accounts of the cultures that have grown around the sites of market transactions, e.g., shopping malls, corporate offices, network t.v., etc. They are also expected to write a paper integrating the readings with their ethnographic materials. *Prerequisite: Com/Cul 100 or consent of instructor. Rafael*

**Com/Cul 181. Colonialism and Culture (4)**

Colonial and postcolonial societies have been historically characterized by the radical redrawing of social boundaries brought about by processes of domination, resistance, and often ambiguous appropriations. What does it mean to speak of culture and communication under such conditions? How are questions about narrative and political authority, modernity and civilization, raised by Western encounters with non-Western people? And how do such matters as tradition, identity, and transformation reworked by indigenous and newly emergent groups within colonial societies function? Finally, what role does nationalism play in determining the limits and possibilities of colonial dis-

course? *Prerequisite: Com/Cul 100 or consent of instructor. Rafael*

**■ COMMUNICATION AND HUMAN INFORMATION PROCESSING**

(Media methods courses are numbered 101-120.)

**Com/HIP 100. Introduction to Communication and the Individual (4)**

A good deal of scholarship concerning the interaction of human beings with various means of communication suggests that different media permit or promote differently structured messages. A wide variety of claims concerning media-individual-interactions are made—beginning with suggestions that language affects thought through claims about the consequences of literacy to suggestions about the influence of electronic media on individual and group behavior. This course will teach the student how to analyze such claims by examining the kinds of data on which they are based and current techniques in the social sciences for their evaluation. *Prerequisite: Com/Gen 20 or consent of instructor. Cole, Padden*

**Com/HIP 104A-B. Theory of the Production of Moving Images (4-4)**

Complex messages, no matter what the content, generally provide clues for preferred interpretations. This course will explore the means by which such clueing is done in film/video. Students will focus on the relationship between the viewer and the maker of moving images through viewing and analysis, theoretical readings, and their own scripting and film/video production. *Prerequisite: Com/HIP 100, Com/Gen 100, Com/SF 101A-B, or consent of instructor. Halleck*

**Com/HIP 110. Media Effects (4)**

This course examines three major approaches to studying effects of media in individuals: survey studies, content analysis, and ethnographic description. Representative studies from each approach are analyzed and compared for types of questions and conclusions drawn. Social and historical influences on interpretation of effects research are also examined. Course requirements include a final project using one of the three approaches. *Prerequisite: communication major or consent of instructor. Padden*

**Com/HIP 111A-B-C. Communicating and Computers (4-4-4)**

This course introduces students to computers as media of communication. Each quarter students participate in a variety of networking activities designed to show the interactive potential of the medium. Field work designed to teach basic methods is combined with readings designed to build a deeper theoretical understanding of computer-based communication. *Prerequisites: Com/HIP 100, communication major, or consent of instructor. Cole*

**Com/HIP 112. Frontiers of Communication (4)**

This class will explore, through directed study, small group and individual, the ways in which computers figure in communication and the networks through which these communications flow. The class makes use of campus based UNIX computer systems to set up, use, explore, and extend network communications and to provide computer help to off-campus sites used by other communication students. Students are expected to discuss the theoretical aspects of their projects in mid-term and final papers. *Prerequisites: HIP 100 and HIP 111, communication major or consent of instructor. Cole*

**Com/HIP 114. Bilingual Communication (4)**

This course is designed to introduce students to recent research techniques in bilingual communication. Students will begin by analyzing the results of recent research on bilingual and monolingual interactions in different settings. The course will then turn to methods of assessing the processes and strat-

egies of communication. These activities will primarily include observations of video-taped bilingual and monolingual communicative interactions in classrooms and tutorial lessons in the analysis of video tape records of such interactions. *Prerequisites: Com/HIP 100 and Com/Gen 100 or consent of instructor. Staff*

**Com/HIP 116. Practicum in Child Development (4)**

(Same as Psych. 128.) This course is intended as a combined lecture and laboratory course for seniors in psychology and communication. Their backgrounds should consist of a solid foundation in general psychology or communication and human information processing. The course will meet for two hours a week of lectures and discussion. Students will be expected to spend four hours of supervised practical experience in a field setting involving children. An additional six hours of student time will be devoted for reading, transcribing field notes, and writing a paper on some aspect of the field work experience as it relates to class lectures and readings. Evaluation of the course will be based on performance in classroom discussion, the judged quality of the students' fieldwork, and the quality of the term paper. *Prerequisites: Com/HIP 100 or consent of instructor. May be repeated three times for credit. Cole*

**Com/HIP 117. Language, Thought, and the Media (4)**

This course examines the ways in which various communicative channels mediate human action and thought. A basic premise of the course is that human thought is shaped in important ways by the communicative devices used to communicate. There is a particular emphasis on how thought develops, both historically and in the individual. *Prerequisites: Com/HIP 100 and Com/Gen 100 or consent of instructor.*

**Com/HIP 121. Literacy, Social Organization, and the Individual (4)**

(Same as Psych. 173.) This course will examine the historical growth of literacy from its earliest precursors in the Near East. The interrelation between literate technology and social organization and the impact of literacy on the individual will be twin foci of the course. Arriving at the modern era, the course will examine such questions as the impediments to teaching reading and writing skills to all normal children in technological societies and the relation between literacy and national development in the Third World. *Prerequisite: Com/HIP 100 or Com/Cul 100 or consent of instructor. Cole*

**Com/HIP 122A-B. Communication and the Community (4-4)**

This course will prepare students to conduct research in a variety of community settings on the institutional and media-derived patterns of communication that affect people's everyday lives. During the first quarter students will visit community settings in San Diego (especially settings involved in teaching literacy skills) and identify a specific area of study (e.g., community or parental attitudes toward the use of two languages to instruct in schools). As they focus on the problem they will study the different methods of research (survey, participant observation, etc.). Evaluation will be by exams and a final paper. These papers will be used as a preliminary proposal for the second-quarter project. During the second quarter students will carry out the study proposed during the first quarter. Evaluation will be by close supervision of the students' research techniques and the final research project. *Prerequisite: Com/HIP 100 or consent of instructor. Staff*

**Com/HIP 123. Children and Media (4)**

(Same as Psych. 182.) A lecture course which analyses the influence of media on children's behavior and thought processes. The course takes an historical perspective, beginning with children's print literature, and encompasses movies, music, television, and computers. The focus of the course is analytical; students will study specific examples of media products intended for children and apply various analytical techniques including content analysis and experimentation to these materials. *Prerequisites: Com/HIP 100 or consent of instructor. Padden*

**Com/HIP 133. Language in Science and Technology (4)**  
Survey of the special uses of language in science and technology using ideas from linguistics, rhetoric, and sociology. Special emphasis on professional skills such as reading, interviewing, writing, and archival work. Term projects will be designed to employ these skills. *Prerequisite: Com/HIP 100 or consent of instructor.* Agre

**Com/HIP 134. Language and Human Communication (4)**

This course looks at the interaction of technology, culture, and language, with a focus on narrative styles. Theories on the role of technology in shaping and transforming talk are examined. Cultural properties such as physical space and work traditions are studied as they bear on styles of talking and talking about the world. Storytelling, humor, and talk of children are used as examples of styles of talking. *Prerequisites: communication major or consent of instructor.* Padden

**Com/HIP 143. The Psychology of the Filmic Text (4)**  
(Same as Psych. 174.) The course will examine a variety of films using different perspectives and methods of psychology to analyze the types of problems raised by the nature of cinematic communication. Topics will include an introduction to basic elements of cinematography, theoretical and technical bases of film's "grammar," perception of moving pictures, the function and status of sound, the influence of film on behavior and culture (and vice versa), the representation of psychological and social interaction, the communication of narrative and spatial information formation, the generation and translation of film's conventions, and the parameters which the medium and the culture impose upon the attempt to express various forms of abstraction in the concrete visual language of film. *Prerequisite: Com/HIP 100 or consent of instructor.* Keysar

**Com/HIP 154. Pornography (4)**

This course will review recent public debate on violence and pornography and the role of mass media. Following a review of media effects research in the area of violence and pornography, class topics will turn to issues of politics of effects research and social interpretation of effects research. Principal documents such as the *Report of the Commission on Obscenity and Pornography* (1970), the *Report of the Attorney General's Commission on Pornography* (1936), and court decisions on civil ordinances prohibiting depiction of violence against women will provide the basis for discussions. *Prerequisite: communication major or consent of instructor.* Padden

**Com/HIP 171A,B,C. Advanced Computer Networking (4)**

This is a project-oriented course designed to provide advanced skills in the use of computers as interactive communications media. Each quarter, in addition to reading texts and articles about theory and applications of computer networking, students are required to complete a project on computer networking. The project requires demonstrated ability to construct a new form of computer mediated communication and to evaluate its effectiveness using appropriate analytic techniques. *Prerequisites: Com/HIP 100, Com/HIP 111, communication major or consent of instructor.* Cole

**Com/HIP 175. Advanced Topics in Communication: Human Information Processing (4)**

Specialized study in communication: human information processing with topics to be determined by the instructor for any given quarter. May be repeated for credit three times. *Prerequisite: Com/HIP 100 or consent of the instructor.* Staff

■ **GENERAL COMMUNICATION**

**Com/Gen 100. Introduction to Media Use in Communication (4)**

Students will develop projects that will help them explore theories of communication by using communication media. Students with "media cards" can use film and/or video for these

projects, but not all students will be required to do so. They can use computers, pen and paper, photography, posters or create parades and/or other performances. The purpose of the course is to link theory to concrete manipulation of any communication form. *Prerequisite: Com/Gen 20 and Com/Gen 21.* Mukerji

**Com/Gen 110. Media Methods for Communication Research (4)**

Students will apply media knowledge and experience to research issues in documentation, analysis-methodology, experimentation, etc., through projects currently being conducted by faculty members. Each student will select a particular faculty member to work with. Students and faculty will participate in a weekly seminar meeting where issues, ideas, problems, and media methods relevant to research will be discussed. During the quarter each student will make a presentation to the seminar of the research project with which he or she is associated, and will prepare a final paper describing the research objectives through the projects, and his or her findings and conclusions. May be taken three times for credit. *Prerequisites: Com/SF 100, Com/Cul 100, Com/HIP 100 and Com/Gen 100, or consent of instructor.* Staff

**Com/Gen 150. Integrative Seminar in Communication (4)**

A major goal will be to assist the student in integrating information about communication phenomena which are ordinarily considered as discrete topics, showing how individual behavior and social phenomena interact, and how these interactions are conditioned by dominant means of communication. It will reexamine the fundamental issues to which students were exposed in the introductory course and in their core courses. These issues center on the ways in which the means of communication mediate human behavior at different levels of social interaction for different purposes. Each of the major means of communication—language, writing, print, radio, television, and film—will be the subject of a two-week long "subunit." For each subunit students will discuss the social conditions under which the medium arose in the course of human history and is used in the modern world, the key features of the process of communication in each medium, and the consequences for society and the individual of some aspect of current social practices. *Prerequisite: SENIOR communication majors only or consent of instructor.* Staff

**Com/Gen 175. Advanced Topics in Communication: General (4)**

Specialized study in communication: General with topics to be determined by the instructor in any given quarter. May be repeated for credit three times. *Prerequisite: Com/Gen 100 or consent of instructor.* Staff

**Com/Gen 195. Instructional Assistance in Communication (4)**

Observation and critique of classroom procedures and content. Assisting in the instruction of a lower-division undergraduate communication course under the supervision of a faculty member. May be taken twice for credit. (P/NP grades only.) *Prerequisites: attendance in course in a previous quarter and a grade of B or better, and consent of instructor.* Staff

**Com/Gen 198. Directed Group Study in Communication (4)**

Directed group study on a topic or in a field not included in the regular curriculum by special arrangement with a faculty member. (P/NP grades only.) May be taken three times for credit. *Prerequisites: Com/SF 100, Com/Cul 100, Com/HIP 100, and consent of instructor.* Staff

**Com/Gen 199. Independent Study (4)**

Independent study and research under the direction of a member of the staff. (P/NP grades only.) May be taken three times for credit. *Prerequisites: Com/SF 100, Com/Cul 100, Com/HIP 100, and consent of instructor.* Staff

■ **MEDIA PRODUCTION COURSES**

(The following courses may only be used as an elective in the major.)

**Com/MP 122. Television as a Social Force (4)**

Primarily a research and production course. Students undertake the research, design, and production of a series of videotaped programs that serve some pressing social need. *Prerequisite: Com/SF 101B or consent of instructor.* Fenner-Lopez

**GRADUATE**

**Com 200A. Introduction to the Study of Communication as Social Force (4)**

This course focuses on the political economy of communication and the social organization of key media institutions. There will be both descriptive and analytical concerns. The descriptive concern will emphasize the complex structure of communication industries and organizations, both historically and cross-nationally. The analytic focus will examine causal relationships between the economic and political structure of societies, the character of their media institutions, public opinion, and public attitudes and behaviors expressed in patterns of voting, consuming, and public participation. The nature of evidence and theoretical basis for such relationships will be critically explored. Hallin, Schiller

**Com 200B. Introduction to Study of Communication: Communication and Culture (4)**

This course focuses on questions of interpretation and meaning. This course will examine how people use texts to interpret the world and coordinate their activities in social groups. Students will study both theories of interpretation in the conventional sense and theories about the act of interpreting. Davis, Keysar

**Com 200C. Introduction to the Study of Communication: Communication and the Individual (4)**

This course will draw on theorists who examine human nature as constituted by social, material, and historical circumstances. This course considers the media in relation to the ontogenetic and historical development of the human being and an examination of the individual as socially constituted in a language-using medium. The role of new communication technologies as part of research methodologies is explored in lecture-seminar. Cole, Padden

**Comm 201A. Experimental Designs and Methods (4)**

This course will familiarize students with a variety of experimental strategies used to study the process and products of communication. The conduct of two small experimental projects will be combined with reading and critique of classic experiments in the field. Cole, Hallin

**Com 201B. Discourse Analysis (4)**

Review and critique of studies employing discourse analysis, focusing on the ways that "discourse" is identified, recorded, and reported. A working notion of "discourse" will develop from works representing diverse disciplinary approaches. Students will record, transcribe, and report on segments of talk in an everyday setting. All participant observation and interviewing strategies fall under the review of the Committee on Human Subjects. Padden, Vasquez

**Com 201C. Ethnographic Methods for Communication Research (4)**

A supervised and coordinated group project will allow students to develop competence in a variety of ethnographic approaches to communication. Subjects covered include choosing a field-work site, setting or process for participation; entry and development of relationships; techniques of observation, interviewing, note taking, and transcription. Course may also include photography and video as research tools. All participant obser-



vation and interviewing strategies fall under the review of the Committee on Human Subjects. Davis, Mukerji

**Com 201D. Historical Methods for Communication Research (4)**

Different approaches to conducting historical research in communication. Such approaches may include the social history of communication technology; structuralist and poststructuralist accounts of language, media, and collective memory; and new historicist treatments of cultural history. Sources, documentation, and the nature of argument from historical evidence are emphasized. Rafael, Schudson

**Com 201E. Political Economic Methods for Communication Research (4)**

Combines methodological critique of classic political-economic studies of communication agencies and institutions with an in-depth research project. The project serves to familiarize students with approaches to documentation and to methodological issues associated with an overarching process or trend, such as social effects of communications technologies, economic concentration in the communications industry, the information economy, transnationalization of networks, deregulation of telecommunications, or causes and impacts of increasing television programming costs. Schiller, Drake

**Com 201F. Textual Analysis (4)**

Students will explore the theoretical stakes and methodological implications of a range of contemporary critical reading practices including but not limited to psychoanalysis, literary criticism, deconstruction, and film theory. Readings will be drawing from the works of Lacan, Foucault, Irigaray, Derrida, Bakhtin, Eco, de Lauretis, White, and Barthes. Keyssar, Hartouni

**Com 205. Mass Communication: Theories of Analysis (4)**

This course centers on power and the special role of mass media in modern society. The course will investigate the assumptions a theorist employs in order to assess media power; it will inquire how a theorist "measures" the effects of mass communication on individuals or on society as a whole. It will examine the major schools of mass communication theory. Horwitz

**Com 209. International Communications (4)**

This course will examine the material infrastructure of communication flows internationally, focusing on the major transmitters and categories of the messages and imagery. Emphasis will be placed on the impact of international communication on national sovereignty and the character of economic development. Staff

**Com 210. Information and Society (4)**

The social, legal, and economic forces affecting the evolution of mass communication institutions and structure in the industrialized world. Differential impacts of the free flow of information and unequal roles and needs of developed and developing economies. Staff

**Com 215. Regulation of Telecommunications (4)**

The course will look at the history of, and rationales for, the regulation of mass communications in the United States. The course will cover both broadcasting and common carrier regulation. We will analyze telecommunications regulatory structures as they were constituted historically with the 1934 Communications Act and examine their breakdown in the late 1970s. In a larger vein, the course will examine the rise and functions of regulatory agencies in modern American history. Horwitz

**Com 216. Research Problems in Global Communications (4)**

Despite the importance of telecommunications and information industries and policies in contemporary world politics, there remains a dearth of sophisticated, theoretically informed academic

research on these subjects. This course provides graduate students with a multidisciplinary introduction to the field and attempts to delineate research strategies for doctoral work. Topics include theories of comparative and international policy making and political economy, and their application to numerous issues in global communications and information.

*Prerequisite: graduate standing or consent of instructor.* Drake

**Com 220. The News Media (4)**

History, politics, social organization, and ideology of the American news media. Special attention will be paid to historical origins of journalism as a profession and "objective reporting" as ideology; empirical studies of print and TV journalism as social institutions; news coverage of Vietnam and its implications for theories of the news media. Schudson

**Com 230. Media Production: Access and Control (4)**

This course will engage students in planning and executing a video production. At each step, from conceiving an idea to seeking funding for production to interacting with people and institutions during production to editing to seeking broadcast access, the course will examine the politics of video production or, if you will, the "micro-politics" that influence and constrain production and its dissemination. Halleck

**Com 232. History of U.S. Political Communication (4)**

Survey of the history of political communication in the United States from the colonial period to present. Students will work on term papers in which they will undertake original historical research. Schudson

**Com 235. Culture and Ideology (4)**

This course will examine the concept of culture from a variety of viewpoints in the social sciences and humanities: 1) culture as conceived of as a "style" of a person, group, or class; 2) culture as a cognitive system or framework of perception—culture as class rule or as preconscious constraints on thoughts; and 3) culture as the artifacts produced by societies or social organizations—culture as industrial construction or as professional construction. Schudson

**Com 236. Popular Culture (4)**

This class will be an opportunity for students to review major contributions to the field from the disciplines of anthropology, history, literature, sociology and American studies, and to experiment with some of the recently developed methods for studying popular forms. They will then be able to consider more precisely the potential and actual contribution of studies of popular culture to the discipline of communication. Mukerji

**Com 245. Performance and Audience (4)**

This course will explore the history and nature of audience as a concept and phenomenon. The first half of the term will be spent surveying the historical nature of the relations of audience to performance and to social groups. The second half of the course will address modern and contemporary aspects of audience, taking into consideration the effects of radio, film, and television on audience and nature of audience in contrasting cultures such as that of contemporary China and the United States. Keyssar

**Com 250. Sound and Image (4)**

This course will explore the structure and strategies of oral and visual representations, in particular as they are organized into systems of meaning in film, television, and photography. Changes in the nature and function of imaging over time as well as the interrelationship of sound and visual image will be explored. Narrative and point of view will be key concerns. Cole, Keyssar

**Com 260. Language and Human Communication (4)**

Introduction to analysis of structure and content of human language communication. Differences in communicative styles

among different culture groups will be compared and contrasted. Situations resulting in communication breakdown such as interethnic miscommunication and cases of language pathology (schizophrenia and language delay) will be examined as a technique for understanding properties of human communicative systems. Padden

**Com 261. Advanced Seminar in Mediatonal Approaches to Culture/Mind (4)**

This course will examine theories of mind in which cultural mediation is given a leading role. The work of anthropologists, psychologists, and communication scholars will be studied in depth. Emphasis will be placed on the methodological implication of cultural theories of mind for empirical research. *Prerequisite: graduate standing or consent of instructor.* Cole

**Com 265. Literacy (4)**

This course will examine the historical growth of literacy from its earliest precursors in the Near East. The interrelation between literate technology and social organization and the impact of literacy on the individual will be twin foci of the course. Arriving at the modern era, the course will examine such questions as the impediments to teaching reading and writing skills to all normal children in technological societies and the relation between literacy and national development in the Third World. Cole

**Com 275. Topics in Communication (4)**

Specialized study in communication, with topics to be determined by the instructor for any given quarter. *Prerequisite: graduate standing or consent of instructor.* Staff

**Com 280. Advanced Workshop in Communication Media (4)**

This course is a project course in which students prepare a production or experiment using one of the forms of media. The course is designed to allow students to experiment in a communication form other than the usual oral presentation in class or a term paper. Students can do video production, a coordinated photographic essay or exhibit, a computer instructional game, a published newspaper or magazine article directed at a special audience, a theatrical presentation, or some form other than those mentioned. May be repeated for credit six times. Staff

**Com 294. The History of Communication Research (4)**

Intellectual history of the field of communication studies from Robert Park to the present. Explication and assessment of major research approaches and classic studies representing both empirical and critical traditions. Schiller, Horwitz

**Com 296. Communication Research as an Interdisciplinary Activity (4)**

A course oriented toward a re-analysis of communication as a discipline. The content of this course is to provide the student with as well-integrated a framework as possible for initiating strong communication research in the dissertation. Staff

**Com 298. Directed Group Study (1-12)**

The study and analysis of specific topics to be developed by a small group of graduate students under the guidance of an interested faculty member. Staff

**Com 299. Independent Graduate Study (1-12)**

Advanced independent study in communication under the guidance of Department of Communication faculty. Staff

**Com 500. Practice Teaching in Communication (4)**

A doctoral student in communication is required to assist in teaching undergraduate Department of Communication courses for a total of six quarters. One meeting per week with the instructor, one meeting per week with the assigned sections, and attendance at the lecture of the undergraduate course in which he or she is participating are part of this requirement. *Prerequisites: graduate standing and consent of instructor.* Staff

▼ **C**OMPARATIVE STUDIES  
IN LANGUAGE, SOCIETY,  
AND CULTURE

OFFICE: 3354 Literature Building  
534-3826/534-3217

**Program Faculty**

Michael Meeker, Ph.D. *Department of Anthropology*

Jann Pasler, Ph.D. *Department of Music*

Don E. Wayne, Ph.D. *Department of Literature*

Graduate students in the humanities, social sciences, and arts in this program, and under guidance of an interdepartmental committee, are given the opportunity to design strongly interdisciplinary curricula, on the basis of which they write their dissertations. The program requires that the student be admitted and fundamentally trained in one discipline and that he or she undertake M.A.-level studies in an integrally related discipline or culture area. The qualifying examination will cover the whole of the student's studies, although its structure will be that designed by the department in which the student is fundamentally trained.

Application to the Program in Comparative Studies may be made at the earliest during the student's third quarter of residency in his or her primary department. From the point of acceptance into the program, the student's work will be under the supervision of an interdisciplinary committee, which will conduct the examination for Ph.D. candidacy, approve all study and research plans including the dissertation proposal, and forward them to the Graduate Council for final approval. The degree granted will indicate in its title the precise nature of the student's studies and research—e.g., Ph.D. in Comparative Literature and Ethnopoetics, in Linguistics and Literary Studies, in Economics and Chinese Studies, in Philosophy and the History of Ideas. Students applying for admission to UCSD and interested in applying for admission to the program should direct their inquiries to a primary department. Students already admitted to a primary department should, after the required quarters of residence and with the advice of a departmental adviser, direct inquiries to the chair of the program.

**PH.D. TIME LIMIT POLICIES**

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed six years. Total registered time at UCSD cannot exceed eight years.

▼ **C**OMPUTER SCIENCE  
AND ENGINEERING (CSE)

See Engineering, Division of.

▼ **C**ONTEMPORARY BLACK  
ARTS PROGRAM

OFFICE: 1539/1540 Galbraith Hall

**Director**

Floyd Gaffney, Ph.D.

**Faculty**

Ken Anderson, *Visiting Lecturer, Music*

Robert Cancel, *Associate Professor, Literature*

James Cheatham, *Senior Lecturer with Security of Employment, Music*

Frances Foster, Ph.D., *Professor, Literature*

Floyd Gaffney, Ph.D., *Professor, Theatre*

Luther James, *Associate Professor, Theatre*

Sandra Foster-King, M.F.A., *Visiting Lecturer, Theatre*

Cecil Lytle, B.A., *Professor, Music*

Faith Ringgold, M.A., *Professor, Visual Arts*

Julie Saville, M.A., *Acting Assistant Professor, History*

Quincy Troupe, *Professor, Literature*

Sherley Anne Williams, M.A., *Professor, Literature*

**THE MINOR**

The Contemporary Black Arts Program is an interdisciplinary minor which provides a broad introduction to an appreciation of Afro-American performing arts through lecture, studio courses, and public performance. Students who complete the minor must meet the following requirements:

1. A required core of the following three lecture courses:

**Theatre 41. Introduction to Black Drama (4) (F)**

**Literature/English 17. Introduction to Afro-American Literature (4) (S)**

**Music 127A. Music of Black Americans (4) (W)**

2. A fourth lecture course selected from the following approved list:

**Theatre 165. Modern Black Drama (4) (W)**

**Literature/English 185. Themes in Afro-American Literature (4) (F)**

**Literature/English 188. Contemporary Caribbean Literature (4) (F)**

**Literature/Writing 100. Beginning Fiction (4) (F)**

**Music 126. Introduction to Oral Music (4) (F)**

**Music 127B. Music of Black Americans (4) (S)**

**History/U.S. 135. Slavery and the Atlantic World (4) (W)**

**History/U.S. 136. Slavery and Freedom in Nineteenth-Century U.S.: Images and Reality (4) (S)**

**Writing 102. Poetry (4) (F,W,S)**

**Writing 120. Personal Narrative (4) (F)**

**VA 1. Introduction to Art (4) (W,S)**

3. Completion of a total of eight units of performance courses selected from the following approved list:

**Music 95G. Gospel Choir (2) (F,W,S)**

**Music 95J. Jazz Ensemble (2) (F,W,S)**

**Music 131. Jazz Improvisation (4) (F,W,S)**

**Theatre 125. Dances of the World (4) (F,W)**

**Theatre 137A. Black Theatre Ensemble (4) (F)**

Students interested in either taking Contemporary Black Arts Program courses or completing the minor are encouraged to discuss their interests and develop a course of study with a faculty member of the program at their earliest convenience.

▼ **C**ONTEMPORARY ISSUES

OFFICE: 2024 Humanities and Social Sciences Building, Muir College

**Director**

Patrick J. Ledden, Ph.D.

**Courses**

**LOWER DIVISION**

**2. Seminars (Titles and Topics Vary) (2,3,4)**

Seminars directed by members of the UCSD faculty and visiting professors and treating in depth one contemporary issue or small group of related issues. (Consult the *Schedule of Classes* for possible offerings.) (F,W,S)

**22. Human Sexuality (4)**

A survey of the nature and problems of human sexuality in the development of the individual, in cultural traditions and values, and in social roles and organizations, particularly with regard to contemporary America. L. Ross

**30A. Environmental Issues: Natural Sciences (4)**

This course examines global and regional environmental issues. The approach is to consider the scientific basis for policy options. Simple principles of chemistry and biology are intro-



duced. The scope of problems includes air and water pollution, climate modification, solid waste disposal, hazardous waste treatment, and environmental impact assessment. *Prerequisite: None.* P.C. Chau (F)

**30B. Environmental Issues: Social Sciences (4)**  
This course explores contemporary environmental issues from the perspective of the social sciences. It will include the cultural framing of environmental issues and appropriate social action, the analysis of economic incentives and constraints, and a comparison of policy approaches. *Prerequisite: none.* R. Carson, S. Strum, F.J.P. Poole (W or S)

**50. Information and Academic Libraries (2)**  
An introduction to research strategies directed at satisfying the information needs of the student using the academic library, with emphasis on the UCSD library system. Library techniques will be acquired through lectures and discussion, problem sets, and a term project. Students will learn to extend these techniques to independent research.

## UPPER DIVISION

**136. The Anthropology of Medicine (4)**  
(Same as ANGN 128.) Theoretical approaches to and cross-cultural analyses of the role of the medical profession, the sick and the healers, and culture as communication in the medical event. The theoretical anthropological aspects of medical practice and medical research will include a consideration of the "Great Traditions" of medicine as well as primitive and peasant systems. Western medicine will be considered in the foregoing framework, with issues of contemporary concern by way of introduction. *Prerequisite: upper-division standing.* L. Ross

**181. Seminar in Medical Anthropology (4)**  
(Same as ANGN 191.) Seminar in medical anthropology to go beyond principles learned in introductory course: to examine theory and method in the analysis of studies and research projects through surveying the literature and clinical situations (medical anthropological writings, medical grand rounds, epidemiology). *Prerequisite: ANGN 128/CI 136.* L. Ross

**195. Discussion Leading in Contemporary Issues (4)**  
Students will lead groups of ten to twenty students in discussions of contemporary concern. Students will meet with the professor to plan and prepare for their discussions to be held weekly. Students will also consult with another faculty member specializing in their topics for further check on reading materials and course of discussion. (P/NP grades only.) *Prerequisite: Contemporary Issues 96 or 196 and consent of the director of Interdisciplinary Sequences.*

**196. Contemporary Issues Workshop (2)**  
A workshop for potential discussion leaders in the Contemporary Issues Program. Students will investigate topics for discussion and methods of presentation and inquiry. Participating in the workshop does not guarantee selection as discussion leader. (Offered fall quarter only.) (P/NP grades only.)

**198. Group Studies in Contemporary Issues (4)**  
Group studies, readings, projects, and discussions in areas of contemporary concern. Course is set up so that students may work together as a group with a professor in an area of contemporary concern whereby the group emphasis would be more beneficial and constructive than individual special studies. *Prerequisite: consent of instructor.* (P/NP grades only.)

**199. Special Studies in Contemporary Issues (2-4)**  
To be offered during fall, winter, and spring quarters. Permission of the director of Interdisciplinary Sequences is required. The 199 course is to be made up of individual reading and projects in the areas of contemporary concern. Term paper and/or completed project is required. This class is given under special circumstances, e.g., student abroad. (P/NP grades only.)

## CULTURAL TRADITIONS

OFFICE: 2024 Humanities and Social Sciences Building, Muir College

**Director**  
Patrick J. Ledden, Ph.D.

Each year a faculty committee develops interdisciplinary three-course sequences. The particular cultures to be studied may vary from year to year, though some, such as the Judaic culture studies sequence, have attracted such widespread interest that they may be carried over from one year to the next. Other sequences have been offered in such cultures as Asian, Latin American, Mediterranean, Chicano, and American Indian.

A descriptive list of the sequences offered for the coming academic year is available in time for the fall enrollment. Inquiries about the program or projected sequences may be addressed to staff in Room 2024 of the Muir College Humanities and Social Sciences Building.

## Courses

**1A-B-C. Cultural Traditions (4-4-4)**  
A three-quarter sequence involving the study of the deep and surface structures of the lifestyle of one specific culture. The approach from several disciplines addresses itself to analyses of the social, political and economic institutions, the aesthetic structuring through formal artistic expression, and the cultural forms of everyday living. (F,W,S)

**134. The Cultures of Mexico (4)**  
(Same as ANRG 134.) Various aspects of the multiple cultures of Mexico from the anthropological perspective will include field studies by anthropologists focusing on changing emphases in investigative style and analyses, peasant communities, *ejidos*, studies of elites, indigenous "Indian" cultures, and culture change. L. Ross

## DIMENSIONS OF CULTURE

OFFICE: Third College, TCHB 132

**Program Coordinator**  
Charles Cooper, Ph.D., *Professor of Literature*  
**Assistant Program Coordinator**  
Susan MacDonald, Ph.D.

The Dimensions of Culture Program is a three-course sequence taught by senior faculty from the Departments of History, Political Science, Anthropology, Communication, Ethnic Studies, and Literature. This program provides

an interdisciplinary issues-oriented exploration of American, Western, and non-Western culture.

The first quarter, **Diversity**, introduces students to the study of basic distinctions in social differences and commonalities among human individuals and groups. This course surveys a range of social differences and stratifications that shape the nature of human attachment to self, work, community, and a sense of nation. The second quarter, **Justice**, introduces basic concepts of political and social theory and moral philosophy. Readings are drawn from traditional, contemporary, Western, and non-Western works as well as from legal case studies. The third quarter, **Imagination**, introduces students to the study of the arts as the cultural expression of the issues presented in the first two quarters. Materials focus on the interdisciplinary study of twentieth-century American culture, including music, literature, art, and film.

Written assignments are required in each quarter of the Dimensions of Culture sequence. In the second and third quarters, students receive intensive instruction in university-level writing in small sections. Frequent writing assignments and revisions are required in connection with the material presented in class.

The Third College core course and writing requirements are met by completion of this sequence. Students must have satisfied the university's Subject A requirement before enrolling in Justice or Imagination. All Third College first-year students must complete this three-course sequence. Transfer students should see their college academic adviser regarding the appropriate course requirements.

For further details on Third College requirements, see "Third College, General-Education Requirements."

## Courses

### LOWER DIVISION

**1. Dimensions of Culture: Diversity (4)**  
This course focuses on sociocultural diversity in examining age, class, ethnicity, race, gender, and sexuality as significant markers of differences among persons. Emphasizing American society, it explores the cultural understandings of diversity and the economic, moral, political, and other social consequences. Three hours of lecture, one hour of discussion. Open to Third College students only. (Letter grade only.) (F)

**2. Dimensions of Culture: Justice (6)**  
This course considers the nature of justice in philosophical, historical, and legal terms. Topics include racial justice, political representation, economic justice, gender and justice, rights within the family, the rights of cultural minorities, and crime and punishment. The course offers intensive instruction in writing university-level expository prose. Three hours of lecture,

## EARTH SCIENCES

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two hours of discussion and writing instruction. Open to Third College students only. (Letter grade only.) *Prerequisite: completion of Subject A requirement.* (W)

### 3. Dimensions of Culture: Imagination (6)

Using the arts, this course examines the evolution of pluralistic culture to the modern period. There is a special emphasis on the interdisciplinary study of twentieth-century American culture, including music, literature, art, and film. The course offers intensive instruction in writing university-level expository prose. Three hours of lecture, two hours of discussion and writing instruction. Open to Third College students only. (Letter grade only.) *Prerequisite: completion of Subject A requirement.* (S)

## EARTH SCIENCES

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OFFICE: 1512 Galbraith Hall, Revelle College  
(See also "Scripps Institution of Oceanography.")

The *UCSD Interdisciplinary Earth Sciences Undergraduate Program* is a transition program between the Physics/ES and Chemistry/ES specialization programs, which have been offered since 1968, and a proposed earth sciences department, to be implemented at a future time.

It should be kept in mind that both the chemistry/earth science major and the physics/earth science major will continue to exist. These programs emphasize chemistry and physics, respectively, with specialization in the earth sciences. Students currently enrolled in these programs will therefore have a choice between completing their education under the conditions described in the physics and chemistry catalog chapters, respectively, or transferring to the new earth sciences major program, if the requirements can be satisfied.

The program offers an earth sciences major leading to a B.S. degree, with emphasis on the quantitative aspects of the field and a broad formation rooted in fundamental physics and chemistry, in addition to a modern earth sciences curriculum. The program takes advantage of the unique opportunities offered by UCSD, in particular through the Scripps Institution of Oceanography and the California Space Institute. The major can be well complemented by various minors ranging from mathematics, physics, or chemistry, to biology, environmental science, or public policy and political science. In addition, the program offers a broad choice of courses, including general-education courses in the earth sciences and related topics, from which to select a minor in the earth sciences. As a guiding concept, the focus of the earth sciences curriculum is placed on the evolution of the Earth system, and on the energetics and dynamics of this evolution.

It should be noted that the program is still under development, and that some courses are still in the process of being defined and developed. For example, environmental geochemistry, biogeochemistry, global geochemical cycles, are course concepts that required further preparation before they can be offered. Similarly, physics of the earth interior and advanced seismology are concepts under development. Descriptions for such courses will appear in future editions of the catalog. In some cases, interested students have the option to take graduate courses touching on these topics, after consulting with the program coordinator, and with the consent of the instructors.

## MAJORS IN EARTH SCIENCES

Two earth sciences major programs are presently offered through the UCSD Interdisciplinary Earth Sciences Undergraduate Program. These are the *ES/chemistry* and *ES/physics* majors. A grade-point average of 2.0 or higher in the upper-division major program must be achieved for graduation. All courses (lower- and upper-division) required for the major must be taken for a letter grade.

For both majors, lower-division requirements are designed to provide the foundations in mathematics, physics, and chemistry that are essential in modern quantitative earth sciences disciplines. In addition, two courses introducing the basic concepts of geology and geochemistry, ES 101 and ES 102, are required to provide the appropriate background for upper-division courses. Although ES 12 is not listed as a required course, students not familiar with basic ideas concerning the early Earth, the geological time scale, and the evolution of life are strongly encouraged to take this course as well.

## SPECIAL STUDIES COURSES

Special studies courses in the earth sciences are offered as the SIO courses ES 198 and ES 199. These courses are subject to consent of the instructor and approval by the ES adviser. These courses are open to students who have accrued at least ninety quarter-units and have a GPA of at least 3.0. No more than two quarters of earth sciences special studies may be counted toward any earth sciences major.

## ES/CHEMISTRY MAJOR

This specialization focuses on the Earth as a chemical system, and on its evolution. Emphasis is placed on the fundamental observations that allow geoscientists to understand better the past history of the planet, the energetics of its evolu-

tion, and the major "cycles" (e.g., water, carbon) that characterize and control planetary-scale changes on a broad range of time scales. Comparative planetology (i.e., comparisons with other bodies of the solar system) will be highlighted as a basic tool to improve our understanding of the Earth itself. The major is appropriate for students interested in modern geochemistry, in the space sciences approach to "global change" studies, and in global and local environmental problems, including biochemical and anthropogenic effects.

## LOWER-DIVISION REQUIREMENTS

The following courses must be taken for a letter grade:

1. Math. 2A, 2B, 2C, 2D
2. Physics 2A, 2B, 2C, 2D
3. Chemistry 6A, 6B, 6C, 6BL (½)
4. Earth sciences courses which should be taken in the sophomore year  
ES 101. Introduction to Geology  
ES 102. Introduction to Geochemistry

## UPPER-DIVISION REQUIREMENTS

The following courses must be taken for a letter grade:

1. Earth sciences requirements:  
ES 103. Introduction to Geophysics  
ES 120. Mineralogy  
ES 162. Introduction to Field Geology
2. Chemistry requirements:  
Chemistry 120A. Inorganic Chemistry  
Chemistry 131. Physical Chemistry  
Chemistry 141A. Organic Chemistry  
Chemistry restricted electives: minimum of 16 units selected from:  
Chemistry 141B, 141C. Organic Chemistry  
Chemistry 143A, 143B. Organic Chemistry Lab (½)  
Chemistry 130, 132. Physical Chemistry  
Chemistry 105A, 105B. Physical Chemistry Lab (½)  
Chemistry 106. Instrumental Analysis Lab  
Chemistry 120B, 120C. Inorganic Chemistry  
Chemistry 122. Biochemical Evolution  
Chemistry 149A. Environmental Geochemistry
3. Earth sciences restricted electives: at least 16 units selected from among the following courses must be passed with a 2.0 grade-point average:  
ES 130. Geodynamics of Terrestrial Planets  
ES 142. Atmospheric Chemistry  
ES 144. Isotope Geochemistry

- ES 150. Igneous and Metamorphic Petrology
- ES 153. Interpretation of the Sedimentary Record
- ES 155. Geological Record of Planetary Evolution
- ES 160. Tectonics and Structural Geology

Students may wish to incorporate a small portion of the major program into their lower-division course load. For example, Chemistry 120A, Chemistry 141A.

A possible schedule yields:

FALL	WINTER	SPRING
<b>JUNIOR YEAR</b>		
Chem. 141A	Chem. 131	Chem. Elect.
—	Chem. Elect.	—
ES 120	—	ES 103
—	ES Elect.	ES Elect.
<b>SENIOR YEAR</b>		
Chem. Elect.	Chem. Elect.	—
ES Elect.	ES Elect.	ES Elect.
—	ES 162	—

## ES/PHYSICS MAJOR

This specialization focuses on the mechanical, dynamical, and thermodynamical aspects of the Earth. Emphasis is placed on a solid background of fundamental physics, from mechanics and electromagnetism to continuum- and quantum mechanics, and on the necessary mathematical skills. The major introduces basic techniques used to investigate the internal structure of the Earth, from seismology to the study of potential fields, and space geodesy. Elementary geodynamics, including the physics of simple convective systems, introductory rock mechanics, and plate kinematics are among topics introduced. At the same time, a "hands on" exposure to field problems and techniques will be accessible through a Natural Resources and Field Geophysics sequence.

## LOWER-DIVISION REQUIREMENTS

The requirements are essentially the same as for physics majors. The following courses must be taken for a letter grade:

1. Mathematics 2DA-EA-F, or 2DH, EH, FH
2. Physics 4A-B-C-D-E, and 2CL-DL, or 2A-B-C-D and 2CL-DL. (The Physics 4 sequence is strongly recommended.)
3. Chemistry 6A, 6B, 6BL (1/2), or Chemistry 7A-B and 6BL (1/2)
4. Earth sciences courses which should be taken in the sophomore year
  - ES 101. Introduction to Geology
  - ES 102. Introduction to Geochemistry

## UPPER-DIVISION REQUIREMENTS

The following courses must be taken for a letter grade:

1. Earth sciences requirements:
  - ES 103. Introduction to Geophysics
  - ES 130. Geodynamics of Terrestrial Planets
2. Physics requirements:
  - Physics 100A-B-C. Electromagnetism
  - Physics 110A-B. Mechanics

Physics restricted electives: minimum of 4 units selected from:

  - Physics 150. Continuum Mechanics
  - Physics 140A, 140B. Statistical and Thermal Physics
  - Physics 105. Computational Physics
3. Mathematics restricted electives: minimum of 8 units selected from:
  - Mathematics 110. Partial Differential Equations
  - Mathematics 102. Linear Algebra
  - Mathematics 120A, 120B. Complex Analysis
  - Mathematics 183. Statistical Methods
4. Earth sciences restricted electives: at least 12 units selected from among the following courses must be passed with a 2.0 grade-point average:
  - ES 120. Mineralogy
  - ES 150. Geological Record of Planetary Evolution
  - ES 160. Tectonics and Structural Geology
  - ES 162. Introduction to Field Geology
  - ES 180. Geophysics of Natural Resources
  - ES 182. Field Geophysics
  - SIO 223. Geophysical Data Analysis
  - SIO 224. Physics of the Earth Interior
  - SIO 227. Advanced Seismology

Students may wish to incorporate a small portion of the major program into their lower-division course load. For example, Physics 105, Mathematics 110. Students are also strongly encouraged to participate in a field geology course.

An example schedule is outlined below.

FALL	WINTER	SPRING
<b>JUNIOR YEAR</b>		
Phys. 100A	Phys. 100B	Phys. 100C
Phys. 110A	Phys. 110B	—
—	—	Math. 110
—	—	ES 103
<b>SENIOR YEAR</b>		
Phys. Elect.	—	—
Math. Elect.	Math. Elect.	—
ES Elect.	ES 130	ES Elect.
—	ES Elect.	—

## EARTH SCIENCES MINOR

A minor in earth sciences consists of three lower-division courses, such as ES 10, ES 12, ES 20, ES 30, ES 40 (except ES 45), and three

upper-division courses, focused on geology, geochemistry, or geophysics. Courses required by a student's major may not be applied toward a minor. Courses for the minor may be taken on a Pass/Not Pass basis if the student's college permits. The Warren College program of concentration is similar, but not identical, to a minor.

## Courses

**NOTE: The program will endeavor to offer the courses outlined below. However, unforeseen circumstances might mandate a change of scheduled offerings, especially the quarter offered (F,W,S). Students are strongly advised to check the *Schedule of Classes* or to contact the Earth Sciences Program office in order to obtain up-to-date information.**

## LOWER DIVISION

### ES 10. The Earth (4)

A basic introduction to geology for students with little previous science background. The course stresses understanding of the concepts of the structure of the Earth and the processes which have formed it and continue to modify it. The course emphasizes material which every educated citizen should know for appreciation and enjoyment of the world around us, for understanding geological events as reported in the news, and for participating in making intelligent decisions regarding the future of our environment. Three-hour lecture plus optional local field trips. (W)

### ES 12. History of the Earth and Evolution (4)

A geologist's view of the evolution of the Earth. We will consider the making of the Earth in the early solar system, the differentiation of the Earth's surface into continents and ocean basins, and how the planet became habitable. We will trace the evolution of life on the planet since its inception some 3 billion years ago. Particular attention will be devoted to the geologic record of climatic changes and extinctions, with an eye to the relevance of this record to future human-induced environmental shifts. Three-hour lecture. *Prerequisites: none.* SIO staff (W)

### ES 20. The Atmosphere (4)

Descriptive introduction to meteorology and climate studies. Topics include global and continental wind and precipitation patterns, weather forecasting, present climate and past climate changes (including droughts, El Niño events), man-made modification of climate, including CO<sub>2</sub> and other "greenhouse" gases effects, ozone destruction, "little ice ages," acid rain. Three-hour lecture. *Prerequisites: some high school physics and chemistry background recommended.* SIO staff (W)

### ES 30. The Oceans (4)

Presents modern ideas and descriptions of the physical, chemical, biological, and geological aspects of oceanography, and considers the interactions between these aspects. Intended for students interested in the oceans, but who do not necessarily intend to become professional scientists. Three-hour lecture, one-hour discussion. *Prerequisite: some background in high school chemistry recommended.* SIO staff (F)

### ES 40. Earth Sciences and the Environment (4)

A survey of earth and environmental sciences as they deal with humans' impact on the global environment and the availability of resources. Topics chosen may vary somewhat from year to

year, but focus on the evidence for, and the dynamics of, global change from human activity. Resource limitations, climate modification, water cycle, ecological principles, and basic political and economic factors are discussed in the framework of global habitat modification, including large-scale extinction. *Prerequisites: freshman physics and chemistry, and any basic earth science course.* W. Berger and SIO staff (S)

**ES 45. From Mythology to Modern Earth Sciences (4)**  
Introduction to selected geological phenomena that are the subject of both scientific study and of myth, bringing out the difference in the scientific approach to prescientific knowledge about natural processes, and the gradual emancipation of geologic thinking from its nonscientific origins. Discussion involves three types of topics: the present ruling paradigm of geology (plate tectonics), the history of geology, and selected examples of myth (e.g., the Sumerian flood legend, Plato's story of Atlantis, Hawaiian legends of Pele, and Icelandic myths regarding the origin of the world). *Prerequisites: basic background in science and history.* W. Berger, Y. Bentor, and SIO staff (W)

## UPPER DIVISION

**ES 101. Introduction to Geology (4)**  
This introductory course traces the evolution of the Earth from its formation as a planet in the solar system to its present state. A broad range of subjects, from the effect of the atmosphere and weather on the Earth's surface to formation of mountain ranges and the ocean basins through plate tectonics helps create an awareness in students of the geologic environment in which they live. The course includes laboratory sections and several local field trips. *Prerequisites: one year each of college-level math, physics, and chemistry, and consent of instructor.* (F)

**ES 102. Introduction to Geochemistry (4)**  
A broad introduction to the chemical composition and evolution of the Earth and the solar system. This course explores applications of chemical methods to elucidate the origin and geologic history of the Earth and the planets, the evolution of the oceans and atmosphere, and the impact of man on the environment. *Prerequisite: ES 101, first-year Revelle chemistry, math., and physics or equivalent, or consent of instructor.* (S)

**ES 103. Introduction to Geophysics (4)**  
An introduction to the use of physical measurements to determine the structure and composition of the solid Earth. Topics include an introduction to earthquake seismology, the gravity and magnetic fields, isostasy, and elementary concepts in geodynamics. The course summarizes current knowledge of the interiors of the Earth as determined by modern geophysical techniques. *Prerequisites: Math. 2; Phys. 2, ES 101.* SIO staff (W)

**ES 120. Introduction to Mineralogy (4)**  
This course focuses on the symmetry, crystal structure, chemical, and physical properties of minerals with special emphasis on the common rock-forming minerals, and highlights the applications of mineralogical and X-ray crystallographic techniques to a spectrum of important problems in the earth sciences. The laboratory will introduce the students to the polarizing microscope and X-ray powder diffraction methods for the study of rock-forming minerals. *Prerequisites: ES 101, ES 102.* (W)

**ES 130. Geodynamics of Terrestrial Planets (4)**  
Planetary differentiation through geodynamical processes is the fundamental agent controlling the evolution of the planet on geological time scales. Similarities and differences between the Earth, Venus, Mars, and other terrestrial planets and satellites teach us about the processes which shape a planet's formation and evolution. The course includes a computer-oriented lab. *Prerequisites: Math. 2; Phys. 2, or consent of instructors.* Minster, Phipps-Morgan, and SIO staff. Offered in alternate years (1993-94).

**ES 142. Atmospheric Chemistry and the Biochemical Cycles of Atmospheric Trace Gases (4)**  
Evolution of the Earth's atmosphere, from the earliest days of the planet to the present, and into the future. The atmospheres of other terrestrial planets are discussed to provide a planetary perspective. Discussions will include effects of "greenhouse" gases such as H<sub>2</sub>O, CO<sub>2</sub>, and CH<sub>4</sub> in climate modification, and other influences of civilization's byproducts on atmospheric chemistry, e.g., the destruction of the ozone layer. The biogeochemical cycles of the radiatively important trace gases will be examined. Offered in alternate years (1992-93). SIO staff (S)

**ES 144. Isotope Geochemistry (4)**  
Isotopic ratios of various elements serve as natural tracers, as chronometers, and as geothermometers. Thus isotope measurements have become an indispensable tool for earth scientists. This course introduces students to the theory of radioactivity, geochronology, and stable isotope fractionation and shows how these principles are used to investigate important geochemical problems. *Prerequisites: ES 101, ES 102, ES 120.* (S)

**ES 150. Igneous and Metamorphic Petrology (4)**  
Physical, chemical, and mineralogical properties of igneous and metamorphic rocks. Emphasis is on the origin and genetic relationships as interpreted from field occurrences, theoretical studies, and experimental data. *Prerequisites: ES 101, ES 102, ES 120.* Hawkins (S)

**ES 153. Interpretation of the Sedimentary Record (4)**  
Sediments provide the most complete record of surface conditions on the Earth, including the climates, ocean and atmospheric compositions and circulation patterns, tectonic environments of the past, the history of sea-level fluctuations, and the evolution of life. This course deals with the sedimentary record, emphasizing interpretation of petrologic and stratigraphic evidence based on direct study of sediments in the laboratory and in the field. *Prerequisites: ES 101, ES 102, or consent of instructor. To be taken preferably after ES 150.* (W)

**ES 155. Geological Record of Planetary Evolution (4)**  
This course provides an overview of the Earth from a geochemical and petrogenetic point of view. Topics include the formation and chemical differentiation of material in the solar system, the formation and differentiation of the Earth into core, mantle, crust and atmosphere/hydrosphere, the generation of magma in a variety of plate tectonic settings, and isotope and trace element geochemistry of igneous and metamorphic rocks. Literature readings will be assigned for most topics and discussion is expected of everyone. *Prerequisite: ES 150 or consent of instructors.*

**ES 160. Tectonics and Structural Geology (4)**  
The major structural features of the continents and oceans are now understood in terms of the theory of plate tectonics. We examine small- and large-scale structural features in a global context, the underlying processes, and their impact on humans (e.g., earthquakes). The diverse geology of California, which includes a major plate boundary, provides an excellent basis for this course and associated field trips. *Prerequisites: ES 101, ES 102, and consent of instructor.* SIO staff. Offered in alternate years (1993-94). (W)

**ES 162. Introduction to Field Geology (4)**  
Mapping and interpretation of geologic units and structures in the field. Field observations at the surface are related to theory and extrapolated to three dimensions. Field work is done on weekends in local areas; field data are discussed and evaluated through applicable geologic principles in the laboratory. *Prerequisites: ES 101, ES 120, and ES 160 or consent of instructor.* SIO staff (W)

**ES 180. Geophysics of Natural Resources (4)**  
Introduction to seismic, gravity, magnetic, and electrical methods used in exploration geophysics on scales of hundreds of kilometers to tens of meters. These are the principal

means of discovering energy and mineral resources such as oil, gas, and ore deposits. Emphasis is on the underlying physical principles of the methods, instrumentation, and data interpretation, including an introduction to geophysical inverse theory. *Prerequisites: Math. 2, Phys. 2, ES 103, or consent of instructor.* (S)

**ES 182. Field Geophysics (4)**  
Introduction to design and execution of simple geophysical field experiments, including seismic, gravimetric, geoelectrical, and geodetic techniques. The focus is on a simple geological problem that can be solved by geophysical experiments. Computer-aided data analysis and interpretation. *Prerequisites: ES 103, ES 180 (can be taken concurrently), or consent of instructor.* (S)

**ES 198. Directed Group Study (2-4)**  
This course covers a variety of directed group studies in areas not covered by formal ES courses (P/NP grades only). *Prerequisite: consent of instructor.*

**ES 199. Independent Study for Undergraduates (4)**  
Independent reading of research on a problem. By special arrangement with a faculty member. (P/NP grades only.)

## ECONOMICS

OFFICE: 114 Economics Building

### Professors

Richard Attiyeh, Ph.D.  
Donald V.T. Bear, Ph.D.  
George Borjas, Ph.D.  
John Conlisk, Ph.D.  
Vincent Crawford, Ph.D.  
Robert F. Engle, Ph.D., *Chair*  
Clive W.J. Granger, Ph.D.  
Theodore Groves, Ph.D.  
Walter P. Heller, Ph.D.  
Mark J. Machina, Ph.D.  
Ramu Ramanathan, Ph.D.  
Michael Rothschild, Ph.D.  
Joel Sobel, Ph.D.  
Ross Starr, Ph.D.  
Halbert White, Ph.D.

### Associate Professors

Jose Luis Guasch, Ph.D.  
Dennis Smallwood, Ph.D.

### Assistant Professors

Julian Betts, Ph.D.  
Richard Carson, Ph.D.  
Wouter J. Den Haan, Ph.D.  
Andrew T. Levin, Ph.D.  
Alfredo Pereira, Ph.D.  
Garey Ramey, Ph.D.  
Valerie Ramey, Ph.D.  
James Rauch, Ph.D.  
Lakshmi Raut, Ph.D.  
Maxwell Stinchcombe, Ph.D.  
Glenn Sueyoshi, Ph.D.



**Adjunct Professors**

Joseph Grunwald, Ph.D.  
Lawrence Krause, Ph.D.  
R. John McMillan, Ph.D.

Economics is the study of how individuals, organizations, and societies deal with scarcity—the problem that available resources are not sufficient to satisfy everyone's wants. Because scarcity requires choice among alternative uses of resources, economics involves both study of the technology by which resources are turned into the things people want and study of the preferences through which people choose among alternatives. Further, since society is composed of many individuals and groups, economics involves study of the institutions through which a society can gain the advantages of cooperation and resolve the conflicts due to competing goals.

**THE UNDERGRADUATE PROGRAM****LOWER-DIVISION COURSES**

The department offers two introductory sequences, Economics 1A-1B-1C and Economics 2A-2B-2C. For each sequence, the A-course is an introductory microeconomics course; the B-course is an introductory macroeconomics course; and the C-course is an applications course which uses the analytical tools introduced in the A and B courses. The 1A-1B-1C courses differ from the 2A-2B-2C courses only in the fact that the latter use calculus in the presentation. Mathematics 1A-1B-1C or better is the prerequisite for enrollment in Economics 2A, 2B, or 2C.

A micro-macro combination (such as 1A-1B), or the equivalent from another institution, is required for upper-division work in economics. (The one exception is the upper-division accounting course, Economics 173, for which the single prerequisite is Economics 4.) Though a micro-macro combination is an acceptable introductory package for upper-division work, students typically will benefit from completion of a three-quarter introductory package (such as 1A-1B-1C). The applications course (1C in the 1A-1B-1C package) gives a broad overview of what is done in economics and thus provides a useful perspective from which to begin upper-division work.

An economics student who completes upper-division work with only a micro-macro combination (such as 1A-1B) is not allowed to pick up the lower-division applications course later; credit will not be given. (However, the applica-

tions course may be taken simultaneously with the first upper-division economics course.)

Modern economics is mathematical, and calculus is a standard working tool. Therefore, there are educational advantages in taking the calculus track of the lower-division courses (2A-2B-2C rather than 1A-1B-1C). Students planning an economics major or a quantitative economics and decision sciences major, especially the latter, are advised to take the calculus track. However, students without calculus or students who have trouble scheduling the calculus track may be reassured by the fact that the economic substance of a micro, macro, or applications course is the same in the calculus as in the non-calculus track.

For this reason, it is acceptable to mix courses from the calculus and non-calculus tracks. For examples, 1A-1B-2C and 2A-1B-2C are acceptable combinations. For the same reason, a student should not take and will not receive credit for both 1A and 2A, or both 1B and 2B, or both 1C and 2C.

The micro and macro courses may be taken in either order, or simultaneously; but both a micro and a macro course must be completed before an applications course. Thus, the three acceptable time sequences are A-B-C, B-A-C, and AB simultaneously followed by C.

The department also offers an introductory accounting course, Economics 4. It has no prerequisite, and it is a prerequisite only for the upper-division accounting course, Economics 173.

**INFORMATION ON MAJORS AND MINORS**

The department circulates an informational brochure for undergraduates, which is available in Room 114 of the Economics Building. The brochure answers questions frequently asked by students, gives practical tips for avoiding problems, and in general provides a more detailed discussion of department programs than is possible in this catalog. It is important for students contemplating a major in the department to be familiar with the brochure.

**ENTRY TO THE MAJORS**

For several years, there were restrictions on entry to the majors. The restrictions were a response to extreme crowding. The crowding problem is now much reduced. Therefore, the entry restrictions have been lifted. Any student in good standing may declare a major in the department by filling out a form at the Office of the Registrar.

**THE ECONOMICS MAJOR**

The economics major is designed to provide a broad understanding of modern economics. Both

the tools of economic analysis and their application to contemporary problems are stressed.

A student majoring in economics must meet the following requirements:

1. Calculus. Mathematics 1A-1B-1C or Mathematics 2A-2B-2C.
2. Lower-division economics. Economics 1A-1B, or 2A-2B or 1A-2B or 2A-1B. In addition, an applications course, either Economics 1C or 2C, is recommended.
3. Introductory statistics and computer use. Social Science 60. (However, some students are exempt from this new requirement. Exempt students are those who first enrolled at UCSD prior to fall 1989, or who were enrolled at another college or university prior to fall 1989 and within three years of enrollment at UCSD, provided that the prior enrollment was not solely during high school and the first summer following high school.)
4. Upper-division core. Economics 100A-B (microeconomics), Economics 110A-B (macroeconomics), and Economics 120A-B (econometrics).
5. Upper-division electives. Six more economics courses at the upper-division level.

Majors are strongly encouraged to complete the lower-division requirements (1, 2, and 3) before beginning the upper-division requirements (4 and 5). Further, majors are strongly encouraged to take Economics 100A-B and either 110A-B or 120A-B prior to the senior year, since numerous upper-division electives have core-course prerequisites.

The following schedule, though not the only possibility, is a well-constructed one for majoring in economics.

FALL	WINTER	SPRING
<b>FRESHMAN YEAR</b>		
Math. 1A or 2A	Math. 1B or 2B	Math. 1C or 2C
<b>SOPHOMORE YEAR</b>		
Econ. 1A, 1B, or 2A	Econ. 1B, 1A, or 2B	Econ. 1C or 2C Soc. Sci. 60
<b>JUNIOR YEAR</b>		
Econ. 100A Econ. 110A or 120A	Econ. 100B Econ. 110B or 120B	Elective Elective
<b>SENIOR YEAR</b>		
Econ. 110A or 120A Elective	Econ. 110B or 120B Elective	Elective Elective

A fuller description of the economics major is contained in the brochure *Economics Curriculum*, available at Room 114 of the Economics Building.

**THE QUANTITATIVE ECONOMICS AND DECISION SCIENCES MAJOR**

The quantitative economics and decision sciences major, hereafter referred to as the "QEDS



major," is a variant of an economics major. Relative to the standard economics major described above, the QEDS major places less emphasis on macroeconomics and more emphasis on microeconomics. Within microeconomics, it places more emphasis on the theory of the firm and less on the theory of the household. It also places greater emphasis on mathematical and statistical tools through which microeconomic decisions can be analyzed.

A student majoring in QEDS must meet the following requirements.

1. Calculus and linear algebra. Mathematics 2A-2B-2C and Mathematics 2E (or 2EA).
2. Lower-division economics. Economics 2A-2B. Economics 1A may be substituted for 2A, or 1B for 2B. However, 2A-B is recommended.
3. Introductory statistics and computer use. Social Science 60. (However, some students may elect instead to meet an older computer requirement. These are students who first enrolled at UCSD prior to fall 1989, or who were enrolled at another college or university prior to fall 1989 and within three years of enrollment at UCSD, provided that the prior enrollment was not solely during high school and the first summer following high school. The older requirement is to take one of the following programming courses: AMES 5, AMES 10, CSE 62A, CSE 65, Math. 71, Math. 77.)
4. Upper-division core. Economics 170A-B (microeconomics), Economics 120A-120B-171 (econometrics and decision theory), and Economics 172A-B-C (operations research).
5. Upper-division electives. Seven upper-division economics courses. Two of the seven must be from the group Economics 175, 176, 177, 178, and 179.

The following schedule, though not the only possibility, is a well-constructed one for a student majoring in QEDS.

FALL	WINTER	SPRING
<b>FRESHMAN YEAR</b>		
Math. 2A	Math. 2B	Math. 2C
<b>SOPHOMORE YEAR</b>		
Econ. 2A Math. 2E	Econ. 2B	Soc. Sci. 60
<b>JUNIOR YEAR</b>		
Econ. 170A Econ. 120A Econ. 172A	Econ. 170B Econ. 120B Econ. 172B	Elective Econ. 171 Econ. 172C
<b>SENIOR YEAR</b>		
Elective Elective	Elective Elective	Elective Elective

A fuller description of the QEDS major is contained in the brochure *Economics Curriculum*, available at Room 114 of the Economics Building.

### MINORS AND PROGRAMS OF CONCENTRATION

The economics minor consists of six courses: an introductory microeconomics course (Economics 1A or 2A); an introductory macroeconomics course (Economics 1B or 2B); and four more economics courses. These four must include at least three upper-division courses, but the four are otherwise not restricted.

Regarding Warren College programs of concentration, students should see Warren academic advisers.

### HONORS

The requirements for departmental honors are described in the brochure *Economics Curriculum*, available at Room 114 of the Economics Building.

### GRADE RULES FOR MAJORS

All courses used in meeting requirements for an economics or a QEDS major must be taken on a letter-grade basis. (Exceptions are courses such as Economics 195 and Economics 199, for which P/NP grading is mandatory. However, no more than twelve units taken P/NP may be counted toward a major.) These courses must be passed with a grade of C- (C minus) or better. These rules apply to lower-division as well as upper-division courses, and they apply to courses taken from other departments (such as required mathematics courses).

### THE GRADUATE PROGRAM

The department offers the M.A., C. Phil., and Ph.D. degrees. However, a student must be admitted to the Ph.D. program in order to be eligible for an M.A. or C.Phil. The main Ph.D. requirements are that a student qualify in microeconomics, macroeconomics, econometrics and two advanced fields and that a student prepare an acceptable dissertation. A detailed description of the Ph.D. program is available by writing the director of graduate studies, care of the Department of Economics. Residence and other campus-wide regulations are described in the graduate studies section of this catalog.

### DEPARTMENTAL PH.D. TIME LIMIT POLICIES

Students must be advanced to candidacy by the end of five years. Total university support cannot exceed six years. Total registered time at UCSD cannot exceed seven years.

## Courses

### LOWER DIVISION

#### 1A-B-C. Elements of Economics (4-4-4)

Elementary theories of resource allocation, income determination, and economic policy. 1A is not required for 1B, but both 1A and 1B are required for 1C. Credit not allowed for both Econ. 1A-B-C and Econ. 2A-B-C.

#### 2A-B-C. Introduction to Economics (4-4-4)

Same content as Economics 1A-B-C, but calculus is used in the presentation. 2A is not required for 2B, but both 2A and 2B are required for 2C. Credit not allowed for both Econ. 1A-B-C and Econ. 2A-B-C.

#### 4. Financial Accounting (4)

Recording, organizing, and communicating economic information relating to business entities.

#### 90. Undergraduate Seminar (1)

Selected topics in economics. May be repeated twice (total of three units) when course topic varies. (P/NP grades only.)

### UPPER DIVISION

#### 100A-B. Microeconomics (4-4)

(Conjoined with Economics 100AH-BH.) Household and firm behavior as the foundations of demand and supply. Market structure and performance, income distribution, and welfare economics. Credit not allowed for both Econ. 100A-B and Econ. 170A-B. *Prerequisites:* one introductory microeconomics course, one introductory macroeconomics course, and Math. 1C.

#### 100AH-BH. Honors Microeconomics (4-4)

(Conjoined with Economics 100A-B.) Honors sequence covering the material of Economics 100A-B. *Prerequisite:* department stamp required.

#### 101. International Trade (4)

Analysis of the causes and patterns of international trade and investment, of the scope for increasing national welfare through foreign trade and investment, and of the policies for realizing those gains and for distributing them internationally. *Prerequisite:* Econ. 100B or 170B.

#### 103. International Monetary Relations (4)

Balance of payments, international capital movements, and foreign exchange examined in light of current theories, policies, and problems. *Prerequisites:* Econ. 110B.

#### 105. Industry Organization and Public Policy (4)

Study of the structure and performance of American industry. Dimensions and determinants of market structure and performance, empirical evidence. Anti-trust laws, regulation of industry, and other aspects of public policy toward industry. *Prerequisite:* Econ. 100B or 170B.

#### 107. Topics in Industrial Organization (4)

Extension of topics covered in I.O. courses, particularly regulation of companies and industries, effects of deregulation on industries such as airlines, telecommunications, broadcasting. *Prerequisite:* Econ. 100A.

#### 109. Game Theory (4)

Introduction to game theory. Applications to such topics as oligopoly, bargaining, contracts, and market interactions. *Prerequisites:* Math. 2C and either Econ. 100B or Econ. 170B.

#### 110A-B. Macroeconomics (4-4)

(Conjoined with Economics 110AH-BH.) The theory of national income determination as the basis for explaining fluctuations in income, employment, and the price level. Use of monetary and fiscal policy to stabilize the economy. *Prerequisites:* one introductory microeconomics course, one introductory macroeconomics course, and Math. 1A-B-C.

**110AH-BH. Honors Macroeconomics (4-4)**

(Conjoined with Economics 110A-B.) Honors sequence covering the material of Economics 110A-B. *Prerequisite: department stamp required.*

**111. Monetary Economics (4)**

Financial structure of the U.S. economy. Bank behavior. Monetary control. *Prerequisites: Econ. 110A-B.*

**112. Advanced Monetary Economics (4)**

Sequel to Economics 111. *Prerequisite: Econ. 111.*

**113. Mathematical Economics (4)**

Mathematical concepts and techniques used in advanced economic analysis; applications to selected aspects of economic theory. *Prerequisites: Econ. 100B or 170B and Math. 2C.*

**115. History of Economic Thought (4)**

Evolution of economic analysis over the last three centuries. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

**116. Economic Development (4)**

Analysis of current economic problems of less-developed areas and conditions for increasing their income, employment, and welfare; case studies of specific less-developed countries. *Prerequisite: one introductory microeconomics course and one introductory macroeconomics course.*

**117. Economic Growth (4)**

Models of the economic growth of developed economies. *Prerequisites: one introductory microeconomics course, one introductory macroeconomics course, and Math. 1A-B-C.*

**118A-B. Law and Economics (4-4)**

Analysis of the economic effects of the structure of the law with particular emphasis on the law of liability, including liability for nuisances, zoning law, products liability, and accident liability. *Prerequisites: for 118A, one introductory microeconomics course and one introductory macroeconomics course; for 118B, 118A with a minimum grade of B and department stamp required.*

**120A-B-C. Econometrics (4-4-4)**

(Economics 120A-B conjoined with Economics 120AH-BH.) Probability and statistics. Regression and other methods commonly used in economics. Credit not allowed for both Econ. 120A and Math. 183. Also, see the "Note on overlaps" at the end of the undergraduate course descriptions. *Prerequisites: one introductory microeconomics course, one introductory macroeconomics course, Math. 1A-B-C, and Social Science 60.*

**120AH-BH. Honors Econometrics (4-4)**

(Conjoined with Economics 120A-B.) Honors sequence covering the material of Economics 120A-B. *Prerequisites: Social Science 60 and department stamp required.*

**121. Applied Econometrics (4)**

Application of econometric methods to such areas as labor supply, human capital, and financial time series. *Prerequisites: Economics 120A-B or 120AH-BH.*

**125. Economics of Population Growth (4)**

Economics of population growth, family size, age profiles, birth and death rates, growth of cities. *Prerequisites: Econ. 120A-B. Econ. 120C and 178 are recommended.*

**130. Public Policy (4)**

Use of economics and related disciplines to study issues of public policy. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

**131. Economics of the Environment (4)**

Analysis of the causes of pollution (air, noise, water) and non-optimal utilization of certain resources (e.g., fisheries, wilderness areas, air) and of public policies to deal with these prob-

lems. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

**132. Energy Economics (4)**

Role of energy in the residential, industrial, and transportation sectors of the national and international economy. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

**133. Housing Policy (4)**

(Same as USP 123.)

Examines housing markets and the U.S. housing finance system. Evaluates federal and local policies and tax incentives to promote housing production, encourage homeownership, provide decent shelter for low-income families, and improve conditions in deteriorated neighborhoods. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

**134. Regional Economics (4)**

Examines the theoretical and empirical determinants of regional and metropolitan economic growth to explain past trends, to forecast future growth patterns, and to evaluate policies designed to redistribute economic activity between regions. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

**135. Urban Economics (4)**

(Same as USP 102.)

Urban economic problems and public policies to deal with them. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

**136. Human Resources (4)**

Theoretical and empirical analysis of public and private investment in people, emphasizing the contribution to productivity of education. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

**137. Inequality and Poverty (4)**

Analysis of inequality in the distribution of income, education, and wealth; causes of poverty and public policies to combat it. *Prerequisites: one introductory microeconomics course, one introductory macroeconomics course, and Economics 120A.*

**138. Economics of Health (4)**

The application of economic analysis to the health field; the role of health in income, production, and poverty; supply, demand, and price determination in the public and private health sectors. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

**139. Labor Economics (4)**

Study of labor markets and related policy. Topics such as collective bargaining, labor force participation, labor mobility, effects of technical change. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course. Economics 100A-B or 170A-B.*

**145. Economics of Ocean Resources (4)**

Economic issues associated with oceans. Living marine resources, nonliving marine resources, and other economic attributes of the sea. *Prerequisites: Econ. 100A-B or 170A-B.*

**146. Economic Stabilization (4)**

Theory of business cycles and techniques used by governments to stabilize an economy. Discussion of recent economic experience. *Prerequisites: Econ. 110A-B.*

**150. Economics of the Public Sector: Taxation (4)**

An analysis of the effects of government taxation on resource allocation and the distribution of income. The efficiency and equity of alternative forms of taxation. Optimal tax policies. Income redistribution through the fiscal process. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

**151. Economics of the Public Sector: Expenditures (4)**

An analysis of the effects of government expenditure policies on resource allocation and the distribution of income. Political and economic determinants of optimal public expenditure and investment policies. An introduction to cost-benefit analysis. *Prerequisite: Econ. 100B or 170B.*

**152. Topics in Public Economics (4)**

Special topics on the economics of the public sector. *Prerequisite: Econ. 150.*

**155. Economics of Voting and Public Choice (4)**

An economic analysis of social decision making, including such topics as the desirable scope and size of the public sector, the efficiency of collective decision-making procedures, voting theory and collective vs. market resource allocation. *Prerequisite: Econ. 100B or 170B.*

**158A-B. Economic History of the United States (4-4)**

(Same as History HIUS 140-141.) 158A: The United States as a raw materials producer, as an agrarian society, and as an industrial nation. Emphasis on the logic of the growth process, the social and political tensions accompanying expansion, and nineteenth- and early twentieth-century transformations of American capitalism. 158B: The United States as a modern industrial nation. Emphasis on the logic of the growth process, the social and political tensions accompanying expansion, and twentieth-century transformations of American capitalism. *Prerequisite: upper-division standing. Introductory economics and U.S. history recommended. Economics 158A is not a prerequisite for Economics 158B.*

**161. Latin American Economic Development (4)**

Development issues facing Latin American countries. Economic policy. Emphasis on Argentina, Brazil, Chile, and Mexico. *Prerequisites: one year of lower-division economics.*

**163. Japanese Economy (4)**

Survey of Japanese economy. Topics such as economic growth, business cycles, saving-investment balance, financial markets, fiscal and monetary policy, labor markets, industrial structure, international trade, and agricultural policy. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

**170A-B. QEDS Microeconomics (4-4)**

(Conjoined with Economics 170AH-BH.) Subject matter of Economics 100A-B, but with greater emphasis on the theory of the firm. Credit not allowed for both Econ. 100A-B and Econ. 170A-B. *Prerequisites: one introductory microeconomics course, one introductory macroeconomics course, and Math. 2C.*

**170AH-BH. Honors QEDS Microeconomics (4-4)**

(Conjoined with Economics 170A-B.) Honors sequence covering the material of Economics 170A-B. *Prerequisite: department stamp required.*

**171. Decisions Under Uncertainty (4)**

Decision making under uncertainty. Decision trees, payoff tables, alternative decision criteria, expected utility theory, and risk aversion. *Prerequisites: one introductory microeconomics course, one introductory macroeconomics course, Econ. 120A-B, and Math. 2E or 2EA.*

**172A-B-C. Introduction to Operations Research (4-4-4)**

Deterministic and stochastic optimization techniques. Linear programming sensitivity, duality; integer programming; network models and related algorithms. Kuhn-Tucker theory, nonlinear programming algorithms. Dynamic programming in deterministic and stochastic contexts, queueing and inventory systems and related problems. A student may not receive credit for both Economics 172A-172B and Mathematics 171A-171B. Also, see the "Note on overlaps" at the end of the undergraduate course descriptions. *Prerequisites: Math. 2E or 2EA, one introductory microeconomics course, and one introductory macroeconomics course. Econ. 120B is required for 172C.*

GRADUATE

**173. Managerial Accounting (4)**

The structure of accounting systems, their underlying assumptions, and their use by management. Basic techniques for recording, summarizing, and evaluating organizational activity; the income statement and balance sheet. Cost accounting and use of accounting for internal control and decision making. *Prerequisite: Econ. 4.*

**174. Insurance, Economics, and Finance (4)**

Insurance markets, law, and terminology. Demand for insurance and for lotteries. Contingent claims theory. Reserves management and efficient risk sharing. Financial theories for regulating insurance rates. Options and insurance. Moral hazard. Adverse selection. Current controversies in insurance. *Prerequisites: Econ. 120A-B and either 100A-B or Econ. 170A-B. Econ. 175 and Econ. 171 are recommended.*

**175. Financial Decisions (4)**

Financial decision making. Such topics as valuing assets, portfolio selection, and capital budgeting. *Prerequisites: one introductory microeconomics course, one introductory macroeconomics course, and Economics 120A.*

**176. Marketing (4)**

Role of marketing in the economy. Topics such as buyer behavior, marketing mix, promotion, product selection, pricing, and distribution. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course, Econ. 120B.*

**177. Topics in Operations Research (4)**

Selected topics in operations research. *Prerequisites: Econ. 120A and Econ. 172A.*

**178. Economic Forecasting (4)**

Forecasting methods such as trend curves, time series techniques, use of expectations data, econometric models, and assorted low-cost approaches. *Prerequisite: one introductory microeconomics course, one introductory macroeconomics course, and Econ. 120A-B.*

**179. Decisions in the Public Sector (4)**

Decision making in the public sector. Topics such as program evaluation, budgeting, financial management, and expenditure decisions. *Prerequisites: Econ. 100A-B or 170A-B.*

**191. Senior Essay Seminar (4)**

Senior essay seminar for students with superior records in department majors. *Prerequisite: department stamp required.*

**195A-B-C. Introduction to Teaching Economics (4-4-4)**

Introduction to teaching economics. Each student will be responsible for a class section in one of the lower-division economics courses. Limited to advanced economics majors with at least a 3.5 GPA in upper-division economics work. (P/NP grades only.) *Prerequisite: consent of the department.*

**199. Independent Study (2 or 4)**

Independent reading or research under the direction of and by special arrangement with a Department of Economics faculty member. (P/NP grades only.) *Prerequisites: consent of instructor and departmental approval.*

**Note on overlaps:** In general, a student may be denied credit for taking the same subject matter in more than one course, even if there is no explicit mention of the overlap issue in the course descriptions. In particular, the subject matter of Econ. 120A-B overlaps the subject matter of probability and statistics courses offered in other departments (Math. 180A-181A, for example); and the subject matter of Econ. 172A-B overlaps the subject matter of Math. 171A-B and AMES 146A-B. It is a student's responsibility to find out, by conferring with relevant advisers, what course combinations are advisable and when credit will be denied.

**200A-B-C-D-E. Microeconomics (4-4-4-4-4)**

Background mathematical techniques, static and intertemporal consumer and producer theory, partial and general equilibrium, modern producer and consumer theory, risk, time, and interdependence, modern welfare economics.

**201A-B-C-D. Advanced Economic Theory (4-4-4-4)**

An intensive examination of selected topics in economic theory. Course topic nonrepetitive in a three-year cycle. *Prerequisites: Econ. 200E and 210D.*

**202A-B-C. Workshop in Economic Theory (0-4/0-4/0-4)**

An examination of recent research in economic theory, including topics in general equilibrium, welfare economics, duality, and social choice; development of related research topics by both graduate students and faculty. Course may be repeated an unlimited number of times. (S/U grades only.) *Prerequisite: Econ. 200E or consent of instructor.*

**205. Mathematics for Economists (4)**

Advanced calculus review for new graduate students.

**210A-B-C-D. Macroeconomics (4-4-4-4)**

Neoclassical and Keynesian theories of employment, income, interest rate, price level, and other aggregate variables; macroeconomic policy; balance of payments and exchange rates; conflicts between external and internal balance; disequilibrium theory; growth theory.

**211A-B-C. Advanced Macroeconomics (4-4-4)**

Selected theoretical and empirical issues in macroeconomics. *Prerequisite: Econ. 210D or consent of instructor.*

**214A-B. Finance (4-4)**

Theoretical and empirical issues in finance.

**220A-B-C-D-E-F. Econometrics (4-4-4-4-4-4)**

The construction and application of stochastic models in economics. This includes both single and simultaneous equations models. Matrix algebra and basic statistics are covered. Also covered (in 220F) are empirical applications to micro and macroeconomics. These require the completion of an empirical project. Both 220E and F will be offered simultaneously in the winter quarter.

**221A-B-C. Advanced Econometrics (4-4-4)**

Extensions of the theory of the linear model; Bayesian analysis; principal components, discriminant analysis, spectral analysis of time series; insufficient data problems and the use of generalized inverse matrices; experimental design; formulation and evaluation of economic models, including the interpretation and testing of causality. *Prerequisite: Econ. 220F or consent of instructor.*

**222A-B-C. Workshop in Econometrics (4-4-4)**

Examination of recent econometric research; development of own research by students and faculty. Course may be repeated an unlimited number of times.

**230A-B. Public Economics (4-4)**

Theoretical and empirical issues in public economics. *Prerequisite: consent of instructor.*

**232A-B-C. International Trade (4-4-4)**

Theory of international trade, finance, and monetary relations. Growth, disturbances, capital movements, and balance of payments adjustment. International economic policy and welfare. *Prerequisite: consent of instructor.*

**234A-B. Industrial Organization (4-4)**

Theoretical and empirical issues in industrial organization. *Prerequisite: Econ. 220F or consent of instructor.*

**235A-B-C. Workshop in Applied Microeconomics and Industrial Organization (0-4/0-4/0-4)**

Examination of recent research in applied economics; development of own research by graduate students and faculty. Course

may be repeated an unlimited number of times. (S/U grades only.)

**236A-B. Human Resource Economics (4-4)**

Theoretical and empirical issues in human resource economics. *Prerequisite: consent of instructor.*

**238. Urban and Regional Economics (4)**

Theoretical and empirical issues in urban and regional economics. *Prerequisite: consent of instructor.*

**240. Economic Development (4)**

Theoretical and empirical issues in economic development.

**242. Economics of Natural Resources (4)**

Theoretical and empirical issues in natural resource economics.

**267. Special Topics in Economics (4)**

A lecture course at an advanced level on a special topic (or set of related topics) in economics. May be repeated for credit if topic differs. *Prerequisites: Econ. 200E, 210D, and 220F, or consent of instructor.*

**269. Seminar in Economics (4)**

A program of regular reports by graduate students on their own research, usually dissertation research. Faculty and visitors are encouraged to participate. May be repeated for credit when subject matter changes.

**272. Third-Year Paper (4)**

Written project, such as a critical review of a body of literature, including a proposal for an original research paper. For third-year students in winter quarter.

**273. Third-Year Presentations (4)**

Workshop for students writing third-year papers. All papers will be formally presented in the workshop.

**274. Third-Year Original Paper (4)**

Original research paper. For third-year students in spring quarter.

**275. Third-Year Original Paper Presentations (4)**

Workshop for students writing third-year original papers. All papers will be formally presented in the workshop.

**276. Fourth-Year Original Paper (4)**

Original research paper. For fourth-year students not admitted to candidacy by spring quarter.

**277. Fourth-Year Original Paper Presentation (4)**

Participation in appropriate workshop in conjunction with preparation and presentation of fourth-year paper.

**280. Computation (2)**

Introduction to econometric computing.

**281. Topics in Computation (1)**

Selected topics in econometric computing. May be repeated five times for credit.

**291. Advanced Field Advising (4)**

Controlled reading and discussion with adviser; literature survey. May be repeated for credit.

**297. Independent Study (1-5)**

(S/U grades only.)

**299. Research in Economics for Dissertation (1-9)**

(S/U grades only.)

**500A-B-C. Teaching Methods in Economics (4-4-4)**

The study and development of effective pedagogical materials and techniques in economics. Students who hold appointments as teaching assistants must enroll in this course, but it is open to other students as well. (S/U grades only.)

## EDUCATION ABROAD PROGRAM (EAP)

OFFICE: Programs Abroad Office in the International Center (corner of Hutchison Way and Gilman Drive)

Robert Cancel, Literature, and Ramon Piñon, Biology, *Faculty Directors*

Mary Dhooge, *Dean of International Education*

Kimberly Burton, *Assistant Director for Programs Abroad*

Molly Ann McCarren, *EAP Adviser*

Administered by the University of California, the Education Abroad Program (EAP) is now entering its twenty-eighth year of operation. Study Centers have been established in Australia, Austria, Brazil, Canada, China, Costa Rica, Denmark, Ecuador, Egypt, France, Germany, Ghana, Hong Kong, Hungary, India, Indonesia, Ireland, Israel, Italy, Japan, Kenya, Korea, Mexico, New Zealand, Norway, Portugal, Russia, Spain, Sweden, Taiwan, Thailand, Togo, the United Kingdom. Most programs are for a single academic year, except for Denmark, Hungary, Russia, Mexico, Togo, China, Costa Rica, Indonesia, Thailand, Korea and Japan, which also offer shorter term/special focus programs. The students who participate in the EAP earn UC academic credit and are eligible for financial aid and many scholarships. Other non-EAP study-abroad opportunities at UCSD are described at the end of this section.

### PURPOSE

The Education Abroad Program was originally designed to give mature, highly motivated, and academically successful upper-division students from all UC campuses rich experience in a new cultural milieu as a part of their normal undergraduate program. Somewhat later, a graduate dimension was added which has now made a significant contribution in assisting a small number of selected students in their progress toward advanced degrees.

The program stimulates the intellectual development of the participants, broadening the general education of all, and giving a new depth to the particular academic interests of some. Most gain fluency in a language other than their own, and all grow in their ability to engage in independent study. Perhaps most valuable of all are increased self-understanding, clarified life purposes, and a broadening and deepening of personal values.

One of the most distinctive features of the program is the emphasis placed on the full integration of the UC students into the life of the host

university. For the most part, UC students abroad live as do the students of the host university: they attend the same classes, take courses from the same professors, and take part in local social and cultural activities. As an aid in facilitating UC student adjustment to unfamiliar educational practices, tutorials are included within the curriculum of most of the Study Centers, supplementing the regular academic offerings of the host university.

### THE ACADEMIC PROGRAM

The Education Abroad Program places students at the finest universities abroad. In most cases students take courses side by side with local students. In some cases EAP students pursue language study and enroll in special courses designed for the program.

Each student is concurrently enrolled on the home campus of the University of California and at the host university. Full academic credit is received for courses satisfactorily completed. The selection of courses is such that, by advance planning and wise choice, most students can make normal progress toward completion of major and/or minor requirements. Some students fulfill some general-education requirements.

### STUDY CENTERS

At any one center, the courses and fields of study open to UC students may be limited. Moreover, each of the host institutions has special areas of excellence and strength. The listing of centers below incorporates selected information concerning these points. More detailed information is available in the flyers describing each of the centers and from the Education Abroad Program counselor in the International Center. Interested students may also discuss the program with academic advisers in their respective provost offices and with faculty/study abroad advisers in each academic department.

#### EUROPE

**Austria.** The program is small and is designed to offer an opportunity to pursue a specialized interest in the areas described below. A compulsory intensive language course in Strobl and Vienna precedes the beginning of the academic year. All courses are taught in German.

*University of Vienna.* Performing arts, economics and political economy, and East/West and Central European studies.

**Denmark.** No language prerequisite, but a summer intensive language program precedes the academic year and continues into the fall. Students may also participate in the summer lan-

guage program at the first-year level and return the following summer to receive instruction at the second-year level; study in Denmark then continues for the full academic year at the University of Copenhagen. Of particular interest are courses in the humanities and social sciences, especially in medieval studies, communications, and international politics and economics.

**France.** All students participate in an orientation and Intensive Language Program (ILP) in France prior to the start of the academic year. Following the ILP, students either enroll in French universities and take lecture and tutorial classes or (in the Paris and Pau-Paris programs) take courses designed specially for EAP students. UC faculty directors are in residence at Bordeaux, Grenoble, and Paris.

*University of Bordeaux.* Course offerings at the University of Bordeaux include anthropology, archaeology, art history, economics, French literature, history, international relations, political science, and some courses in natural sciences and studio art.

*University of Grenoble.* Courses in history, international relations, and political science are particularly strong at the University of Grenoble. UC students may also take courses in art history, economics, French literature, geography, geology, linguistics, political science, psychology, and sociology. Outstanding science students who have good French language abilities may take science courses.

*University of Lyon.* Most EAP students in Lyon take courses offered through the Institute of Political Sciences, which offers a multidisciplinary curriculum aimed at providing an intellectual basis for the interpretation of contemporary societies. Particularly strong are courses in international relations, political science, and Third World studies.

*Paris.* EAP students in Paris enroll in the Critical Studies Program, which offers courses and seminars pertaining to contemporary literary criticism and film theory and explores recent theoretical concepts in other fields, including comparative literature, historiography, linguistics, and philosophy.

*Pau-Paris.* This program explores the history of French civilization and contemporary society, with the regional point of view offered at Pau and the national perspective presented at Paris. Participants spend the first semester at the University of Pau and move to the Paris center (described above) in late January, taking courses designed specifically for the group.

*University of Pau.* Students take courses offered through the Pau-Paris program during the first semester, followed by courses in regular university system during the second semester.



## EDUCATION ABROAD PROGRAM

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Offerings are particularly strong in Basque studies, French history and society, art, economics, French literature, history, international relations, and political science.

*University of Poitiers.* The University of Poitiers is particularly strong in European and contemporary history, art history, French literature, language, linguistics, mathematics, physics, and political science.

*University of Toulouse.* (Pending regental approval)

**Germany.** A compulsory intensive language program precedes the beginning of the academic year. All courses are taught in German. Tutorials supplement courses in which several UC students are enrolled.

*Georg-August University, Göttingen.* Broad curriculum covering most majors. Excellent science programs, with substantial strength in biology, chemistry, physics, and mathematics. Space in laboratory courses in biology and psychology may be limited. Science majors may be restricted to theory courses.

**Hungary.** A fall quarter and a year-long program at Budapest University of Economic Sciences. Instruction is in English and includes courses in Central European history, culture, economics, and economic history. One course is in conversational Hungarian.

**Italy.** A compulsory intensive program in language and contemporary Italian history at the University of Padua precedes the beginning of the academic year. Students who have completed only one year of Italian are eligible for participation in the EAP in Italy but, if selected, must complete the equivalent of the second year prior to the start of the language program in Padua. They must get the second year of Italian by attending the "pre" Intensive Language Program offered during the summer in Italy. A UC faculty director residing in Padua administers all EAP programs in Italy. All courses are taught in Italian.

*The Bisonte International School of Graphic Arts* is a newer institution, founded in 1983 in Florence. Through lectures and studio work, Il Bisonte provides study of both past historical periods and contemporary graphic expression.

*University of Padua.* The academic program consists mainly of regular university courses. Most students study in the humanities and social sciences. For courses in art, history, and literature, the Study Center offers supplemental support courses.

*University of Venice.* Humanities and social science. Faculties of business, economics, literature, and industrial chemistry are renowned.

*University of Bologna,* acclaimed as the oldest university in Europe (1088), acquired its present status as a state institution in 1802. Special strengths for UC students are in the humanities and social sciences.

*Venice Academy of Fine Arts.* Art studio and some history. Color slides of portfolio of artistic work must be submitted for admission.

*Luigi Bocconi Commercial University, Milan.* (Pending regental approval)

*Superior Normal School of Pisa.* (Pending regental approval)

**Norway.** Knowledge of Norwegian is not required, but a compulsory summer intensive course in Norwegian precedes the beginning of the academic year. Intensive language study is continued during the fall semester. All courses are taught in Norwegian, and tutorials can be arranged to supplement some courses.

*University of Bergen.* Humanities, social sciences, natural sciences, and mathematics are available, but space in the sciences may be limited. The usual pattern is study of a single subject, usually the major or a closely allied field, for the entire year.

*Norwegian School of Economics and Business Administration.* Graduate and undergraduate courses may be taken in English through the International Business Program.

**Portugal.** The academic program begins with a six-week intensive Portuguese language program at the Portuguese Language Institute at UCSB. At the University of Lisbon, UC students may take language and liberal arts classes designed for foreigners, as well as offerings within the regular university system. Language prerequisite: two years of university-level Portuguese, or two years of Spanish, or one year of Portuguese with one year of Spanish.

**Spain.** A compulsory intensive language program precedes the beginning of the academic year. All instruction is in Spanish.

*University of Barcelona.* Students take courses at the regular university as well as courses in the humanities specially arranged for the program. These include Catalan studies, Spanish syntax, phonetics, composition, anthropology, literature, history, art history, and music. (This is a cooperative program with the University of Illinois.)

*University of Madrid.* Humanities and some social sciences. The core program, developed for the UC Study Center and other American programs, concentrates on Spanish studies in the broadest sense. Core and Study Center courses are taught by Spanish faculty. In addition, students must take at least one regular university course.

*University of Grenada.* Students can select from a variety of core courses in the humanities and social sciences. Students also take one course through the regular university offerings. Strengths are in literature, art, politics, and history (especially Islamic history and North African studies).

*University of Alcala de Henares.* Students take regular university courses in almost any faculty, with economics, history, and literature being particularly strong.

**Sweden.** Compulsory intensive language course during the summer for students who are not already fluent in Swedish. Language study continues during the fall semester for all students until the student has gained the equivalent of two years of Swedish. Most courses are taught in Swedish, but a few courses offered in English may be available.

*University of Lund.* Broad curriculum. Excellent science programs.

**United Kingdom and Ireland.** The program, which includes seventeen institutions, is administered by a director and associate director located in London. The UK program is highly competitive, largely due to its popularity with students. After a student has been selected for participation by the EAP administration, he or she must still be accepted by a specific department in one of the host institutions. In many host institutions, the student can pursue studies in that department only. Participating institutions are:

England. *University of Birmingham, University of East Anglia, University of Essex, University of Exeter, University of Hull, University of Kent at Canterbury, University of Lancaster, University of Leeds, University of Sheffield, University of Sussex, and University of York.*

Ireland. *University College Cork, University College Galway.*

Scotland. *University of Glasgow, University of St. Andrews, University of Stirling.*

Wales. *University College of Wales, Aberystwyth.*

Generally, the host universities offer a broad curriculum that includes most liberal arts majors. Life sciences and physical sciences are available.

**Russia.** *Alexander Herzen Russian Pedagogical University in St. Petersburg.* EAP offers a direct exchange for undergraduate and graduate students with two to three years of Russian. This is a language program available in fall and spring semesters. For graduate students with four or five years Russian language study, M.A.-level and dissertation-level programs are also offered.



**MIDDLE EAST**

**Egypt.** All courses are taught in English, except courses in Arabic language and literature.

*The American University, Cairo.* A broad curriculum is offered by the faculty of arts and sciences. All students are required to take at least one course in Arabic during the year.

**Israel.** A compulsory language course precedes the beginning of the academic year. Study centers in Israel are administered by a UC faculty director located in Jerusalem.

*Hebrew University, Jerusalem.* Most UC students enroll in courses taught in English at the University's Rothberg School for Overseas Students. Offerings include Hebrew, Israeli, and Middle East and Islamic studies, Arabic, archeology. Students with adequate command of Hebrew have access to a broader curriculum throughout the Hebrew University.

**ASIA**

**India.** *Delhi, University of Delhi.* Students do special Hindi language study, enroll in some regular university classes, and take courses which are designed for foreigners examining contemporary India and its traditions.

**China.** *Beijing (Peking) University.* The purpose of the academic program is to improve the student's facility in spoken and written Standard Chinese and to enable students to gain an insight into Chinese society and culture. Eligibility requirements are a minimum of two years of Chinese language. Undergraduates and graduate students from all disciplines are encouraged to apply.

*Beijing University of Science and Technology.* Students teach English to Chinese students while studying Standard Chinese and doing independent study. Requirements include two years of Chinese language and one course in teaching English as a foreign language.

*Nankai University in Tianjin.* A summer/fall program is available for students with one or two years of university-level Chinese. It includes Chinese language study and courses, in English, in Chinese philosophy, religion, history, economy, politics, arts, and literature.

**Taiwan.** A new program is being developed.

**Hong Kong.** A new focus for the Hong Kong program is being developed to concentrate on international studies from an Asia perspective and area studies. At least half of the academic program consists of language study.

**Japan.** EAP offers general-education programs as well as specialized programs in engineering, economics, global securities studies, and advanced Japanese language. These are full-

year programs, except for the Global Securities Studies Program, which is spring quarter only. Language requirements depend on the specific program. All the full-year programs (except IUC) require an Intensive Language Program in Japan during the summer preceding the academic year. Japanese language instruction continues throughout the year (intensity depending on the program).

*Kyushu University (Fukuoka).* This program is for graduate-level economics students. Admission is based on the merit of the student's research project proposal. Kyushu also offers a very highly developed language program. Previous Japanese language requirements vary.

*Kyushu Institute of Technology (Kitakyushu).* This program is for senior-level undergraduate engineering students. KIT specializes in civil, mechanical, and electrical engineering. One year of university-level Japanese required.

*Doshisha University (Kyoto).* Primarily for undergraduates, the program consists of Japanese language and culture classes along with elective courses from regular university course offerings, taught in Japanese. Exams and papers may be written in English. Three years of university-level Japanese required.

*Nagoya University (Nagoya).* This program is for graduate-level economics students. Admission is based on the merit of the student's research project proposal. Some language instruction is available, with an intensive course possibly offered during the winter break. Two years of university-level Japanese required.

*Osaka University (Osaka).* There are two opportunities at Osaka. For undergraduate economics students (with two years of university-level Japanese), there is a set program of economics courses. In the fall semester the courses are taught in English. In the spring the courses are taught in Japanese, though papers and exams may be written in English. There is also the possibility that senior undergraduate engineering students (with one year of university-level Japanese) will be placed at Osaka.

*Tohoku University (Sendai).* Study in Tohoku is primarily for graduate students in most fields with well-developed individual research projects. Technically it is also open to undergraduates who can follow lectures and manage reading assignments in Japanese. Two to three years of university-level Japanese required. For graduate engineering students, Japanese is strongly recommended, but not required.

*International Christian University (Mitaka, Tokyo).* Primarily for undergraduates, the academic program is at ICU consists mainly of Japanese language courses and Japanese studies courses

(offered in English). One year of university-level Japanese required.

*Sophia University (Tokyo).* Primarily for undergraduates, the program consists of Japanese language courses and courses taken at the Ichigaya campus (in English). Sophia offers special opportunities for students interested in international business. One year of university-level Japanese required.

*Inter-University Center for Japanese Language Studies (Yokohama).* IUC offers an intensive program of training for graduate students in Japanese. It is designed to bring participants to a level of proficiency sufficient for academic or professional use. Two years of university-level Japanese required.

*Meiji Gakuin University (Yokohama).* Offered only in spring quarter, the Global Security Studies Program consists of intensive study of peace and security issues. All instruction is in English. No language prerequisite.

**Korea.** Students study for either summer/fall or a year at Yonsei University in Seoul. The academic program includes language study and courses taught in English in the humanities and social sciences. EAP students proficient in Korean may enroll in regular university courses.

**Indonesia.** Three academic programs are available to students: a summer language program, a summer plus fall program, and a full academic year program.

*Summer Language Program.* Sophomore standing by the end of spring term is required, but there is no language prerequisite. Language classes are taken at Gadjah Mada University in Yogyakarta.

*Summer Plus Fall Program.* Following the summer language program, most students remain at Gadjah Mada and take language courses and an area studies course on modern Indonesia in English. If proficient in Indonesian, students may enroll in the fall in one of the institutions listed in the year program below.

*Academic Year Program.* After the summer and fall components, students pursue their particular academic interests in one of the following institutions: Advanced School of the Arts at Denpasar, Gadjah Mada University, Indonesian Arts Institute in Yogyakarta, Indonesian Dance Institute of Bandung, Institute of Teacher Training and Education, or Padjadjaran University. Most courses offered in Indonesian.

For the Summer Plus Fall and the Academic Year programs, junior standing is required, and prior language study is recommended but not required.

**Thailand.** An eight-week summer language program in Chiang Mai will consist of language

## EDUCATION ABROAD PROGRAM

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study and an area studies course designed for the program. Students have three options: summer only, summer and fall, summer and full year. Students may also participate in the summer language program at the first-year level and return the following summer to receive instruction at the second-year level; study in Thailand then continues for the full academic year. Those who remain for the full year will continue language study at Chiang Mai University and take two courses in Thai history and culture. If a student has sufficient language proficiency, he or she may enroll in regular courses at Chulalongkorn University in Bangkok in November. Otherwise the students will continue to do language study and take area studies in Chiang Mai.

### AFRICA

**Ghana.** University of Ghana is located northeast of Accra, the capital. Students interested in this program must have serious motivation and capacity for independent study and research. The areas of history and African studies (music, drama, and literature) are especially strong, but students may also pursue research in ethnomusicology, geography, language, religious studies, and sociology.

**Togo.** A summer study and field experience. Six-week (twelve-unit) program of intensive French language study and a course on contemporary Africa (in English), followed by individual field projects in rural Togo. Prerequisites are completion of one year university work, good standing at UC, and adequate language to do at least second-year French.

**Kenya.** Open to undergraduate and graduate students. As in the British system, students take a year-long program of study in their major or area of specialization. Examinations are given once, at the end of the academic year, and are mandatory for receiving credit.

*University of Nairobi.* Strengths include courses in the humanities, physical and biological sciences, social sciences; interdisciplinary fields include African studies, development studies, environmental studies.

### LATIN AMERICA

**Brazil.** Language requirements for admission to this program are two years of college-level Portuguese or Spanish, or one year of college Spanish and one year of college Portuguese. This program is administered by the Council on International Educational Exchange (CIEE).

*University of São Paulo.* All instruction is in Portuguese. Most EAP students enroll in courses in anthropology, Brazilian literature, eco-

nomics, geography, history, political science, sociology.

**Costa Rica.** There are three different programs:

*Year Program.* EAP participants study at the University of Costa Rica in San Jose. Students take regular university courses in the humanities and social sciences, with at least half of their course work related to Central America. All classes are taught in Spanish. Two years of university-level Spanish required. The program begins during our winter quarter.

*Tropical Biology Program.* During spring quarter, students who meet certain biology prerequisites may study tropical biology in the rain forest of Monteverde. Previous Spanish is preferred.

*Medical Quarter.* A six-week program for fourth-year medical students in the winter quarter, and for second-year medical students during the summer. It includes language and community and family health clinical studies at the University of Costa Rica.

**Ecuador.** At the Catholic University in Quito students concentrate on courses in Spanish language and in Ecuadorian and Latin American history, politics, and culture. During the second semester they take classes in their particular areas of academic interest. Two years of university-level Spanish are required. (This is a cooperative program with Oregon State University.)

**Mexico.** EAP students in Mexico may study for a summer, one-, two-, or three-quarters, or a full year, on any of three different programs.

*Year Program.* Two years of university-level Spanish are required. A compulsory intensive language program precedes the beginning of the academic year. This is augmented by a course on contemporary Mexico, followed by a four-week field placement. During the academic year, students take regular courses at the *Universidad Nacional Autónoma de México (UNAM)*. Students have the option of a two-quarter, three-quarter, or full calendar-year program.

*Language and Society Summer Program.* Completion of two terms of university work and one year of university-level Spanish are required for the Morelia summer program, which provides the equivalent of the entire second year of Spanish. Courses are designed to facilitate maximum language acquisition through total immersion into Mexican society.

*Study and Field Experience.* The SFE program, offered in both fall and spring quarters, is a general-education program with an emphasis on Mexican area studies. It includes intensive language study and a course taught in English on contemporary Mexico, which combines lectures, field trips, and four weeks of field experience.

Completion of two terms of university work and one year of university-level Spanish are required. The minimum GPA requirement is 2.5.

### SOUTH PACIFIC

**Australia.** The University of California enables students to study at one of eleven universities in Australia: LaTrobe, Monash, and the University of Melbourne in Melbourne; the University of Sydney and the University of New South Wales in Sydney; the University of Adelaide and Flinders University of South Australia in Adelaide; the University of Wollongong; the University of New England in Armidale; the University of Queensland in Brisbane; and the Australian National University in Canberra. Students may indicate a preference for the host university, but final assignment is based on a student's academic field and space availability in a given department at one of the universities. Once accepted, students are expected to concentrate on their major or closely allied field. Students of most academic disciplines can be accommodated in one of the institutions. The program in Australia commences during our winter quarter.

**New Zealand.** Students may study at one of six universities in New Zealand: the University of Auckland, Lincoln University, University of Otago, Victoria University of Wellington, the University of Waikato, and Massey University. Students may indicate a preference for the host institution, but final assignment is based on a student's academic field and space availability in a given department. Most academic disciplines can be accommodated. The program begins during our winter quarter.

### NORTH AMERICA

**Canada.** *The University of British Columbia (UBC)* located outside of Vancouver. This academic-year program will consist of courses in the major or an allied field through the regular university system. Most disciplines can be accommodated. UBC is renowned for its teaching and research in forestry, bio-technology, micro-electronics and lasers, international business, computer technology, and Pacific Rim studies.

### ACADEMIC PLANNING AND ADVISING

A participant who wishes to make normal progress toward graduation should counsel *in advance* with a departmental adviser and an academic adviser in his or her college provost's office in order to ascertain how participation will

affect his or her academic program. Descriptions of individual courses currently approved for UC credit may be found in the Programs Abroad Resource Library. Many of the same or similar courses will be available in future years, but students should plan programs that are sufficiently flexible to allow them to take alternate courses. Each year new courses are added to a center's approved offerings as needed by UC students attending and as available at the host university. Although courses approved by the University of California carry full credit, each department retains the right to determine the extent to which it will accept units so earned in the fulfillment of the requirements for its own majors.

In order to facilitate the academic work of the students, University of California professors serve as directors and associate directors of the study centers. They work with their counterparts in the host university in developing the academic program and advise students on any problem pertaining to their work. In addition, the directors are responsible for all aspects of student welfare and conduct.

### SELECTION

Undergraduate selection is subject to the following minimum qualifications: 3.0 cumulative grade-point average at the time of application (2.5 GPA for the Togo and Mexico Study and Field Experience programs); junior standing by time of departure (not required for some short-term and special-focus programs); support of the UCSD EAP Selection Committee; and completion of university-level language courses when required (one, two, or three years, depending on the host institution) with a 3.0 grade-point average in language.

Prior language is recommended but not required for study in Denmark, Egypt, Hong Kong, Hungary, India, Indonesia, Israel, Kenya, Korea, Norway, Sweden, Taiwan, and Thailand. In addition to academic criteria for selection, the faculty committee attaches much importance to indications of the student's seriousness of purpose, maturity, and capacity to adapt to the experience of study abroad. As part of the screening process, students are required to consult with their college academic and department advisers.

Graduate students may apply for most study centers if they have completed at least one year of graduate work prior to departure and have the support of their academic department and the dean of Graduate Studies.

Transfer students from other colleges and universities are eligible if they have completed at least one quarter at the University of California at the time of selection.

### STUDENT CONDUCT AND PARENTAL APPROVAL

It is anticipated that the students selected for the Education Abroad Program will be of high caliber, committed to profiting from both the intellectual and social aspects of the experience. Since they will be guests in another country and another university, their conduct will reflect on both the University of California and the United States. Students participating in the Education Abroad Program are responsible to the director of the center, to the director of the EAP, to the faculty of the University of California, and to the faculty members of the host university who are related to the program. The director of the EAP reserves the right to terminate the participation in the program of any student whose conduct (in either academic or nonacademic matters), after careful consideration and full review, is judged to be contrary to the standards and regulations of the host university.

Participation in the program by students who are minors must be approved by their parents or guardians. In approving such participation, parents and guardians should be aware that a greater degree of personal freedom is afforded to students in the foreign university and that the University of California cannot take responsibility for closely supervising the activities of individual students. The directors of the centers will be available to students with problems and will maintain close contact with the student group as a whole. The university provides for comprehensive medical and hospitalization coverage for all participants.

### COST AND FINANCIAL AID

The regents endeavor to bring the program within the reach of all students, regardless of their financial resources. The cost of studying abroad is usually comparable to the cost of studying on a UC campus. The only additional costs directly related to the program are for round-trip transportation and vacation travel, and personal expenses beyond what normally would be spent at home. Most University of California financial aid is available to EAP students, including grants, scholarships, and loans. Special grants for minority and economically disadvantaged students are also available. In addition, there are some scholarships provided by the Friends of the International Center and fellowships for certain EAP countries, including most of the Pacific region. Prospective participants who require financial assistance should counsel early with the Student Financial Services Office.

### APPLICATIONS

Application forms for admission to the Education Abroad Program are available in the Programs Abroad Office at the International Center, UCSD, and are given to students following a discussion of various aspects of the program with an EAP adviser. Information on deadlines and related matters such as course offerings, information sessions, selection, schedules of departures, and payment of fees may be obtained from the Programs Abroad Office at the International Center, UCSD. It is not too early to begin planning for a year abroad during one's freshman year. General group information sessions about the programs are held during Welcome Week and in October and January.

### UCSD OPPORTUNITIES ABROAD PROGRAM

Robert Cancel, Literature, and Ramon Piñon, Biology, *Faculty Coordinators*

Mary Dhooge, *Dean of International Education*

Kimberly Burton and William Clabby, *Advisers*

Students interested in going abroad should also investigate possibilities through the Opportunities Abroad Program at the International Center, which can assist with placement in a wide range of other academic programs. Students going abroad through the Opportunities Abroad Program earn transfer credit from the sponsoring institution. Financial aid for approved plans of study abroad is available to students who enroll concurrently at UCSD through the Opportunities Abroad Program.

In addition to these academic programs, the office assists students in selecting a wide range of volunteer, internship, and educational travel programs.

### ENGINEERING, DIVISION OF

OFFICE: 7301 Engineering Building, Unit I, Warren College

The Division of Engineering at UCSD comprises the Departments of Applied Mechanics and Engineering Sciences (AMES), Computer Science and Engineering (CSE), and Electrical and Computer Engineering (ECE). The division is directed by the dean of Engineering. The departments offer many undergraduate curricula and graduate degree programs. Students interested in

engineering should consult the individual department listings which follow this section of the catalog.

Student demand exceeds program capacity in several of the undergraduate majors in each department. Applicants who have demonstrated excellent academic performance prior to being admitted to UCSD will be admitted directly into the engineering major of their choice. Students not admitted directly into an engineering major can select a pre-engineering major and must consult the department of their choice and review the requirements necessary to gain admission.

The general-education requirements of UCSD's five undergraduate colleges differ noticeably. In some cases, these requirements can significantly extend the time required to obtain a B.S. degree in engineering. Prospective students should review the general-education requirements and take them into account when selecting a college.

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### PRE-ENGINEERING MAJORS

Until such time as they are admitted to an engineering program, students may indicate their interest in engineering by using one of the three pre-engineering major codes. Students should use the pre-engineering code of the department that contains the major that they intend to pursue, i.e., pre-AMES, pre-CSE, or pre-ECE.

### ADMISSION TO MAJORS IN THE DIVISION OF ENGINEERING

Pre-engineering students should complete the following courses during their freshman year and apply for admission to an engineering major during the spring quarter of their freshman year:

1. Math. 2A, 2B, 2C
2. Physics 2A, 2B
3. Chemistry 6A or 7A (not required for the B.A. degree in CSE)
4. Any two additional courses in science, math, engineering. One of them must be engineering. In CSE, these two courses must be 62B (or 65) and 70.

Admission will be based on performance in these courses. A performance index is computed by averaging the grades received in the eight courses. While this subset of courses will be used for an admission decision, it is expected that pre-engineering students will follow the recommended curricula (given by the departments below) as much as possible, subject to their college requirements. It is expected that twelve to eighteen units of general education will also be completed in the first year.

Students who are not able to satisfy this application requirement, or who wish to reapply following denial, must do so by the end of their sixth quarter of study at UCSD. This sixth quarter admission review will examine the student's entire academic performance, especially weighing courses in science, math and engineering, together with a consideration of other factors such as rate of progress, quarter course load, trends in performance, etc.

Transfer students in engineering may apply for admission to the Division of Engineering at the time of transfer. If not then, they must apply no later than at the end of their third quarter of study at UCSD. Regardless, transfer students should seek a preliminary appraisal by the department as soon as possible after they decide to attend UCSD. In most cases transfer students will not be admitted to engineering until one quarter of study at UCSD has been successfully completed.

Admission will be granted to the maximum number of students in each major program consistent with maintaining acceptable program quality. Since admissions are restricted, pre-engineering students may apply to more than one major degree program. Applications must be submitted to the Undergraduate Affairs Office in AMES (4103 Engineering Building) or in CSE (4016 Applied Physics and Mathematics Building) and ECE (2705 Engineering Building). These offices may be consulted for additional details.

### ADMISSION OF NON-ENGINEERING MAJORS TO THE DIVISION OF ENGINEERING COURSES

The number of students admitted to some upper-division courses offered by the Division of Engineering must be restricted to meet the resources available. Students who have successfully completed all prerequisite courses will be admitted to these restricted upper-division courses in the following order:

1. Students admitted by the department to a major curriculum
2. Students admitted by the department to a minor curriculum
3. Students fulfilling a requirement for another major
4. All others, with permission of the department and instructor

Students should check with the departments concerning the limitations on specific courses and the requirements needed prior to attempting to enroll.

### MESA ENGINEERING PROGRAM (MEP)

OFFICE: 1802 Applied Physics and Mathematics Bldg. (AP&M), Muir College.

The UCSD MESA Engineering Program provides academic support and guidance for undergraduate engineering students who qualify for MESA program services.

MESA (Mathematics, Engineering, Science Achievement) was founded in 1970 to increase the number of underrepresented ethnic students who graduate with a degree in computer science, engineering, or other mathematics-based majors.

UCSD MEP services include academic advising and workshops, scholarships, opportunities for summer employment, and a variety of social events throughout the academic year. Strong support from local industry provides students the opportunity to explore career possibilities as early as their freshman year.

As a part of the Division of Engineering, UCSD's MEP works closely with the engineering departments' administration and faculty to assist MEP students in accomplishing their educational goals.

### APPLIED MECHANICS AND ENGINEERING SCIENCES (AMES)

STUDENT AFFAIRS: 4103B Engineering Building, Warren College

#### Professors

- H. Aref, Ph.D.
- R. J. Asaro, Ph.D.
- H. Bradner, Ph.D., *Professor Emeritus*
- R. Cattolica, Ph.D.
- S. Chien, M.D., Ph.D., *Director, Institute for Biomedical Engineering*
- Y. C. Fung, Ph.D., *Professor Emeritus*
- C. H. Gibson, Ph.D.
- J. D. Goddard, Ph.D.
- D. A. Gough, Ph.D., *Vice-Chair*
- G. A. Hegemier, Ph.D.
- M. Intaglietta, Ph.D.
- P. A. Libby, Ph.D., *Professor Emeritus*
- S.-C. Lin, Ph.D., *Professor Emeritus*
- J. E. Luco, Ph.D.
- X. Markenscoff, Ph.D.
- M. A. Meyers, Ph.D.
- S. Middleman, D. Eng.
- J. W. Miles, Ph.D., *Professor Emeritus*
- D. R. Miller, Ph.D., *Chair*



W. Nachbar, Ph.D., *Professor Emeritus*  
 S. Nemat-Nasser, Ph.D., *Director, Center of Excellence for Advanced Materials*  
 D. B. Olfe, Ph.D.  
 S. S. Penner, Ph.D., *Professor Emeritus*  
 M. J. N. Priestley, Ph.D.  
 E. Reissner, D. Eng., Ph.D., *Professor Emeritus*  
 G. W. Schmid-Schoenbein, Ph.D.  
 A. M. Schneider, Sc.D.  
 F. Seible, Ph.D.  
 R. Skalak, Ph.D., *Professor in Residence*  
 H.W. Sorenson, *Professor Emeritus*  
 F. E. Talke, Ph.D., *CMRR Endowed Chair*  
 C. W. Van Atta, Ph.D.  
 F. A. Williams, Ph.D., *Director, Center for Energy and Combustion Research*  
 B. W. Zweifach, Ph.D., *Professor Emeritus*

**Associate Professors**

P. C. Chau, Ph.D.  
 M. Gharib, Ph.D.  
 R. K. Herz, Ph.D.  
 J. Lasheras, Ph.D.  
 H. Murakami, Ph.D.  
 C. Pozrikidis, Ph.D.  
 S. Rand, Ph.D., *Professor Emeritus*  
 K. Seshadri, Ph.D.  
 J. B. Talbot, Ph.D.

**Assistant Professors**

D. J. Benson, Ph.D.  
 A. H. Chokshi, Ph.D.  
 A. Hoger, Ph.D.  
 J. B. Kosmatka, Ph.D.  
 A. D. McCulloch, Ph.D.  
 J. M. McKittrick, Ph.D.  
 J. M. Ricles, Ph.D.  
 R. L. Sah, M.D., Ph.D.  
 K. S. Vecchio, Ph.D.

**Affiliated Faculty**

M. J. Bailey, Ph.D., *Associate Adjunct Professor of Computer Graphics*  
 A. L. Berlad, Ph.D., *Adjunct Professor of Combustion Science*  
 J. F. Bille, Ph.D., *Professor of Ophthalmology*  
 R. D. Blevins, Ph.D., *Adjunct Associate Professor of Flow Acoustics*  
 D. B. Bogy, Ph.D., *Professor of Mechanical Engineering, UC Berkeley*  
 J. W. Covell, M.D., *Professor of Medicine and Bioengineering*  
 A. Fronek, M.D., Ph.D., *Professor of Surgery and Bioengineering*  
 A. S. Gordon, Ph.D., *Adjunct Professor of Engineering Chemistry*  
 M. K.-W. Kwan, Ph.D., *Assistant Professor of Surgery and Bioengineering in Residence*  
 K. Messmer, M.D., *Adjunct Professor of Surgery*

R. M. Peters, M.D., *Professor of Surgery and Bioengineering*  
 R. J. Seymour, Ph.D., *Adjunct Professor of Engineering*  
 M. T. Simnad, Ph.D., *Adjunct Professor of Nuclear Engineering and Materials Science*  
 J. B. Slaughter, Ph.D., *Adjunct Professor of Engineering*  
 S. S. Sobin, M.D., Ph.D., *Adjunct Professor of Physiology*  
 J. B. West, M.D., Ph.D., *Professor of Medicine and Bioengineering*

**Professional Research Staff**

S. Ahzi, Ph.D., *Assistant Research Engineer*  
 J. Chris Armour, M.D., Ph.D., *Assistant Research Bioengineer*  
 M. Beizaie, Ph.D., *Assistant Research Engineer*  
 K. Fronek, M.D., Ph.D., *Research Physiologist*  
 S. C. Li, Ph.D., *Assistant Research Engineer*  
 D. Liepmann, Ph.D., *Assistant Research Engineer*  
 D. Lim, Ph.D., Sc.D., *Research Bioengineer*  
 G. T. Linteris, Ph.D., *Assistant Research Engineer*  
 K. Lund, Ph.D., *Assistant Research Engineer*  
 L. Ni, Ph.D., *Assistant Research Engineer*  
 J. Shyy, Ph.D., *Assistant Research Bioengineer*  
 B. Skierczynski, Ph.D., *Assistant Research Bioengineer*  
 K. L. P. Sung, Ph.D., *Associate Research Bioengineer and Lecturer*  
 L. A. Sung, Ph.D., *Associate Research Bioengineer and Lecturer*  
 J. L. White, Ph.D., *Research Engineer*

**DEPARTMENT FOCUS**

The instructional and research programs are grouped into seven major areas: aerospace engineering, bioengineering, chemical engineering, materials science, mechanical engineering, structural engineering, and engineering physics. Both the undergraduate and graduate programs are characterized by strong interdisciplinary relationships with the Departments of Physics, Mathematics, Biology, Chemistry, Economics, Electrical and Computer Engineering, Computer Science and Engineering and associated campus institutes such as the UCSD Center for Energy and Combustion Research, the Institute for Nonlinear Science, Institute of Geophysics and Planetary Physics, Institute for Pure and Applied Physical Sciences, Institute for Biomedical Engineering, Center for Magnetic Recording Research, Center of Excellence for Advanced Materials, California Space Institute, Scripps Institution of Oceanography, and the School of Medicine.

The programs and curricula of AMES emphasize education in fundamentals of engineering sciences. These principles provide a common

foundation for all engineering subspecialties. Education with this emphasis is intended to serve students well during a career in which engineering practice may change rapidly.

**THE UNDERGRADUATE PROGRAM**

**DEGREE AND PROGRAM OPTIONS**

AMES offers two separate types of undergraduate programs. The first is a traditional engineering program leading to the **B.S. degree in engineering** with options in bioengineering, chemical engineering, mechanical engineering, structural engineering, aerospace engineering (a new option available to entering 1992 freshmen), and engineering science. The second is a two-year upper-division program leading to a **B.A. or B.S. degree in applied science** with options in either applied mechanics or premedical bioengineering. This upper-division applied science program is designed to accommodate students who do not wish to specialize at an early stage in their college careers. While students are expected to complete the same preparation in mathematics, physics, and chemistry as required for the traditional engineering program, all the departmental major course requirements in the two options are confined to the upper division. The difference between receiving the B.A. or B.S. degree in applied science depends on the total number of units the student completes: the B.A. requires a minimum of 180 units, the B.S. requires a minimum of 192 units. The department recommends that all applied science students fulfill the additional unit requirement to receive the B.S. degree, which must be accomplished with at least twelve units of approved technical elective credit.

All AMES programs of study have strong components in laboratory, numerical computation on computers, and design applications and are designed to prepare students receiving bachelor's degrees for professional careers or for graduate education in their area of specialization. In addition, the programs can also be taken by students who intend to use their undergraduate engineering education as preparation for postgraduate professional training in nontechnical fields such as business administration, law, or medicine.

**Chemical engineering** is a traditional curriculum encompassing studies in organic and physical chemistry, fluid mechanics, heat and mass transfer, separation processes, and reactor and plant design. Many chemical engineering



students pursue M.S. or Ph.D. degrees, but most seek employment at the B.S. level. They are employed not only in the traditional petrochemical, food, and polymers industries but also in high-technology industries such as electronics and aerospace.

**Mechanical engineering** is also a traditional four-year curriculum in mechanics, vibrations, thermodynamics, structures, fluid flow, heat transfer, materials, and mechanical design. This program also has a strong systems controls component so that students have a general introduction to the emerging area of robotics. Graduates of this program may enter the high-technology electro-mechanical industry as well as find employment in the mechanical and aerospace industry.

**Structural engineering** concerns the design and analysis of civil, mechanical, aerospace, and ocean structures. Examples include bridges, dams, buildings, aircraft, spacecraft, ships, oil platforms, automobiles, and other transportation vehicles. This field requires a thorough knowledge of linear and nonlinear behavior of solids (concrete, soils, rock, metals, composite materials, and plastics), fluid mechanics as it relates to structural loads, dynamics as it relates to structural response, mathematics for the generation of theoretical structural models and numerical analysis, and computer science for simulation purposes associated with computer-aided design, response analyses, and data acquisition. Basic understanding of material behavior and structural performance is enhanced by laboratory courses involving static and dynamic stress and failure tests of structural models.

**Aerospace engineering** is a four-year curriculum that begins with fundamental engineering courses in mechanics, thermodynamics, materials, solid mechanics, fluid mechanics, and heat transfer. Additional courses are required in aerospace structures, aerodynamics, flight mechanics, propulsion, and aerospace design. Graduates of this program will normally enter the aerospace industry to develop aircraft and spacecraft, but also may find employment in other areas that use similar technologies, such as mechanical and energy-related fields. Examples include automobile, naval, biotechnology, and sporting equipment manufacturers. This option is new for the 1992-93 academic year. The department does not anticipate offering all of the senior-year courses (see curriculum outline) until the 1994-95 academic year.

**Bioengineering** is an interdisciplinary major in which the principles and tools of traditional engineering fields, such as applied mechanics and mechanical, electrical, structural, and chemical engineering, are applied to characteristic bio-

medical problems. Engineering plays an increasingly important role in medicine in projects that range from basic research in physiology to the development of medical prosthetics using robotics and the improvement of health care delivery. By its very nature, bioengineering is broad and requires a foundation in the engineering sciences as well as in physiology and aspects of basic medical sciences. The curriculum prepares students for careers in the biomedical industry, but many bioengineering graduates continue their education in medical school. Students completing the four-year B.S. in engineering program have sufficient preparation in applied mechanics to permit employment in traditional engineering areas other than the biomedical industry, if they wish. The two-year **B.A./B.S. applied science premedical** curriculum has significantly less engineering content. It is designed to meet most of the requirements of American medical schools and is also suitable for those planning to enter graduate school in bioengineering, physiology, or neurosciences.

The **engineering science** program resembles the mechanical engineering program, except that the amount of mechanical design is reduced and control theory is not required. In addition to core courses in dynamics, vibrations, structures, fluid mechanics, thermodynamics, heat transfer, and laboratory experimentation, a large number of technical electives are scheduled. This aspect of the curriculum allows flexibility, permitting specialization and in-depth study in one area of the engineering sciences or development of a sequence of courses emerging from the current research interests of the faculty of AMES and/or other departments, e.g., sequences in the earth sciences, transportation, or energy-related studies. Students intending to do postgraduate professional work in nontechnical fields such as business administration, law, or medicine may develop an appropriate sequence of courses. Although a sequence in the non-sciences may be permitted, the faculty adviser may insist on a substantial number of AMES or other science courses as technical electives. Clearly, students must consult their advisers to develop a sound course of study to fulfill the technical elective requirements of this program.

**Applied mechanics** is that area of engineering which provides the scientific basis of mechanical, aerospace, and civil engineering. This two-year upper-division program prepares students with breadth in the foundations of these engineering fields. Course work includes applied mathematics, application of computing to engineering problems, fluid dynamics, solid mechanics and structures, particle and rigid-body

dynamics, thermodynamics, linear systems analysis, and a sequence in experimental techniques.

**Systems and control engineering**, formerly offered by the Department of AMES, will now be offered by the Department of ECE.

### OTHER UNDERGRADUATE PROGRAMS OF STUDY IN AMES

The **engineering physics** program is jointly offered by the Departments of AMES, ECE, and Physics and is administered by the Department of ECE. See "Engineering Physics Program" under ECE for details.

The **engineering mechanics minor** involves successful completion of a total of six AMES courses, including selected upper-division courses open to pre-AMES students who meet the course prerequisites: one must be 121A; one must be 101A (or 103A) or 130A (or both may be taken); and the balance must be selected from AMES 10, 11, 15, 102, 110, 111 or 121B. This set of courses provides a good introduction to engineering analysis and would be useful to non-engineering majors desiring a background that could be used in professional communication with engineers.

**Other minor or double major** options are restricted. Students wishing to arrange a sequence of AMES courses to satisfy minor or double major requirements, or to meet particular academic interests, must consult the AMES student affairs office for referral to the appropriate AMES faculty member.

### PROGRAM ACCREDITATION

The following options within the four-year B.S. degree in engineering are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET/EAC): bioengineering, chemical engineering, mechanical engineering, and structural engineering.

### MAJOR REQUIREMENTS

Specific course requirements for each major program are outlined in tables in this section of the catalog. To graduate, students must maintain an overall GPA of at least 2.0, and the department requires at least a C- grade in each course required for the major.

Deviations from these programs of study must be approved by the Undergraduate Studies Committee *prior* to taking alternative courses. In addition, technical elective (TE) course selections must have departmental approval *prior* to taking the courses. In the accredited programs, TE courses are restricted to meet ABET standards. Courses such as Biology 195 and AMES 198 are

not allowed as technical electives in meeting the upper-division major requirements. AMES 195, 197, and 199 courses are allowed as technical electives only under restrictive conditions. Policy regarding these conditions may be obtained from the department's Student Affairs Office.

Students with different academic preparation may vary the scheduling of lower-division courses such as math, physics and chemistry, but should consult the department about deviations in scheduling AMES upper-division courses. Most AMES courses are taught only once per year, and courses are scheduled to be consistent with the curricula as shown in the tables. A tentative schedule of course offerings is available from the department each spring.

### GENERAL-EDUCATION/COLLEGE REQUIREMENTS

For graduation each student must satisfy general-education course requirements determined by the student's college as well as the major requirements determined by the department. The five colleges at UCSD require widely different general-education courses, and the number of such courses differs from one college to another. Each student should choose his or her college carefully, considering the special nature of the college and the breadth of general education.

Each AMES program allows for humanities and social science (HSS) courses so that students can fulfill their college requirements. In the ABET accredited programs, students must develop a program that includes a total of *at least* twenty-four units in the arts, humanities, and social sciences, not including subjects such as accounting, industrial management, finance, or personnel administration. It should be noted, however, that some colleges require more than the nine or ten HSS courses indicated in the major charts. Accordingly, students in these colleges would take longer to graduate than the indicated four-year schedule. Students must consult with their college to determine which HSS courses to take.

### PROFESSIONAL LICENSING

After graduation, all students are encouraged to take the Engineering-in-Training (EIT) examination as the first step in becoming licensed as a professional engineer (PE). Students graduating from an accredited program can take the PE examination after EIT certification and two years of work experience; students graduating from a nonaccredited program can take the PE examination after EIT certification and four years of work experience.

## FOUR-YEAR PROGRAM IN ENGINEERING

### MECHANICAL ENGINEERING (ABET Accredited Program)

FALL	WINTER	SPRING
<b>FRESHMAN YEAR</b>		
Math. 2A*	Math. 2B*	Math. 2C*
AMES 10	Phys. 2A*	Phys. 2B*/2BL
Chem. 6A* <sup>2</sup>	Chem. 6B/6BL	AMES 11
HSS <sup>1</sup>	HSS	HSS
<b>SOPHOMORE YEAR</b>		
Math. 2DA	Math. 2EA	Math. 2F
Phys. 2C/2CL	AMES 15	AMES 130A
AMES 121A	AMES 121B	HSS
HSS	HSS	HSS
<b>JUNIOR YEAR</b>		
AMES 105A	AMES 102	AMES 170
AMES 163A	AMES 163B	AMES 121C
AMES 130B	AMES 154	AMES 110
HSS	HSS	HSS
<b>SENIOR YEAR</b>		
AMES 101A	AMES 101B	AMES 101C
TE <sup>3</sup>	AMES 171A	AMES 171B
ECE 171A	ECE 171B <sup>4</sup>	TE
AMES 158	AMES 156A	AMES 156B

\* Six of the eight courses used to compute the performance index upon which pre-engineering majors are admitted to the major at the end of the freshman year. Of the other two courses used in this computation, one must be in engineering and one must be in engineering, science, or mathematics.

<sup>1</sup> In fulfilling the humanities and social science requirements (HSS), students must take a total of at least twenty-four units in the arts, humanities, and social sciences, not including subjects such as accounting, industrial management, finance, or personnel administration. Nine or ten HSS courses are listed here; individual college requirements may be higher.

<sup>2</sup> Chem. 7A-B sequence may be taken in place of Chem. 6A-B.

<sup>3</sup> One technical elective (TE) must be an upper-division or graduate course in the engineering sciences, natural sciences or mathematics; the other TE must be selected from a list of approved energy, thermo-science courses available in AMES' student affairs office. Both must be selected with **prior** approval of the department to meet ABET standards.

<sup>4</sup> With departmental approval, ECE 171B may be replaced by AMES 157 or a second energy or thermal science TE to meet ABET standards.

### STRUCTURAL ENGINEERING (ABET Accredited Program)

FALL	WINTER	SPRING
<b>FRESHMAN YEAR</b>		
Math. 2A*	Math. 2B*	Math. 2C*
AMES 10	Phys. 2A*	Phys. 2B*/2BL
Chem. 6A* <sup>2</sup>	AMES 15	AMES 11
HSS <sup>1</sup>	HSS	HSS
<b>SOPHOMORE YEAR</b>		
Math. 2DA	Math. 2EA	Math. 2F
Phys. 2C/2CL	HSS	HSS
HSS	AMES 102	AMES 110
AMES 121A	AMES 121B	AMES 130A
<b>JUNIOR YEAR</b>		
AMES 105A	AMES 163A	AMES 170
AMES 130B	AMES 130C	AMES 121C
AMES 154	AMES 132A	AMES 132B
HSS	HSS	HSS

### SENIOR YEAR

Math. 120A	AMES 135	Math. 183 <sup>3</sup>
AMES 103A	AMES 131A	TE <sup>4</sup>
AMES 133	AMES 158	AMES 136 <sup>5</sup>
AMES 134	AMES 173	HSS

\* Six of the eight courses used to compute the performance index upon which pre-engineering majors are admitted to the major at the end of the freshman year. Of the other two courses used in this computation, one must be in engineering and one must be in engineering, science, or mathematics.

<sup>1</sup> In fulfilling the humanities and social science requirements (HSS), students must take a total of at least twenty-four units in the arts, humanities, and social sciences, not including subjects such as accounting, industrial management, finance, or personnel administration. Nine or ten HSS courses are listed here; individual college requirements may be higher.

<sup>2</sup> Chem. 7A may be taken in place of Chem. 6A.

<sup>3</sup> Math. 183 may be replaced by AMES 139.

<sup>4</sup> Technical elective (TE) course must be an upper-division or graduate course in the engineering sciences, natural sciences or mathematics, selected with **prior** approval of the department to meet ABET standards.

<sup>5</sup> With departmental approval, AMES 136 may be replaced by other structural design courses such as AMES 131B or AMES 137.

### CHEMICAL ENGINEERING (ABET Accredited Program)

FALL	WINTER	SPRING
<b>FRESHMAN YEAR</b>		
Math. 2A*	Math. 2B*	Math. 2C*
AMES 10	Phys. 2A*	Phys. 2B*
Chem. 6A*	Chem. 6B/6BL	Chem. 6C/6CL
HSS <sup>1</sup>	HSS	HSS
<b>SOPHOMORE YEAR</b>		
Math. 2DA	Math. 2EA	Math. 2F
Phys. 2C/2BL	AMES 111	AMES 153
Chem. 126	Chem. 127	Chem. 128
HSS	HSS	Chem 105A
<b>JUNIOR YEAR</b>		
Chem. 141A	Chem. 141B	Chem. 143A
AMES 121A	AMES 163A	AMES 170
AMES 103A	AMES 103B	AMES 103C
HSS	HSS	HSS
<b>SENIOR YEAR</b>		
AMES 112	AMES 113B	AMES 114
AMES 113A	AMES 115	TE
AMES 140	AMES 176A	AMES 176B
HSS	TE	TE <sup>4</sup>

\* Six of the eight courses used to compute the performance index upon which pre-engineering majors are admitted to the major at the end of the freshman year. Of the other two courses used in this computation, one must be in engineering and one must be in engineering, science, or mathematics.

<sup>1</sup> In fulfilling the humanities and social science requirements (HSS), students must take a total of at least twenty-four units in the arts, humanities, and social sciences, not including subjects such as accounting, industrial management, finance, or personnel administration. Nine or ten HSS courses are listed here; individual college requirements may be higher.

<sup>2</sup> Technical elective (TE) courses must be upper-division or graduate courses in the engineering sciences, natural sciences or mathematics, selected with **prior** approval of the department to meet ABET standards.

## APPLIED MECHANICS AND ENGINEERING SCIENCES

### ENGINEERING SCIENCE

FALL	WINTER	SPRING
<b>FRESHMAN YEAR</b>		
Math. 2A*	Math. 2B*	Math. 2C*
AMES 10	Phys. 2A*	Phys. 2B*/2BL
Chem. 6A* <sup>2</sup>	Chem. 6B/6BL	AMES 11
HSS <sup>1</sup>	HSS	HSS
<b>SOPHOMORE YEAR</b>		
Math. 2DA	Math. 2EA	Math. 2F
Phys. 2C/2CL	AMES 15	HSS
AMES 121A	AMES 121B	AMES 130A
HSS	HSS	HSS
<b>JUNIOR YEAR</b>		
AMES 105A	AMES 163A	AMES 121C
AMES 101A	AMES 101B	AMES 101C
AMES 130B	AMES 110	AMES 170
AMES 154	HSS	HSS
<b>SENIOR YEAR</b>		
AMES 158	AMES 171A	Math. 183
TE <sup>3</sup>	TE	TE
TE	TE	TE
HSS	HSS	HSS

<sup>1</sup> Humanities and social science (HSS) courses should be selected to meet general-education requirements of the colleges. Individual college requirements may be higher than what is listed here.

<sup>2</sup> Chem. 7A-B sequence may be taken in place of Chem. 6A-B.

<sup>3</sup> Technical elective (TE) courses must be upper-division or graduate courses in the engineering sciences, natural sciences or mathematics, selected with **prior** approval of the department.

### BIOENGINEERING (ABET Accredited Program)

FALL	WINTER	SPRING
<b>FRESHMAN YEAR</b>		
Math. 2A*	Math. 2B*	Math. 2C*
AMES 10	Phys. 2A*/2BL	Phys. 2B*/2BL
Chem. 6* <sup>1</sup>	Chem. 6B/6BL	Biol. 1
HSS <sup>2</sup>	HSS	HSS
<b>SOPHOMORE YEAR</b>		
Math. 2DA	Math. 2EA	Math. 2F
Phys. 2C/2CL	AMES 15	AMES 130A
AMES 121A	AMES 121B	HSS
HSS	HSS	HSS
<b>JUNIOR YEAR</b>		
AMES 181	AMES 182A	AMES 182B
AMES 154	AMES 163A	AMES 170
AMES 103A	AMES 103B	AMES 183
HSS	Biol. 151	Biol. 153
<b>SENIOR YEAR</b>		
AMES 105A	HSS	HSS
AMES 184A	AMES 184B	AMES 184C
Chem. 126	AMES 158	AMES 174
TE	TE	AMES 186

\* Six of the eight courses used to compute the performance index upon which pre-engineering majors are admitted to the major at the end of the freshman year. Of the other two courses used in this computation, one must be in engineering and one must be in engineering, science, or mathematics.

<sup>1</sup> Chem. 7A-B sequence may be taken in place of Chem. 6A-B.

<sup>2</sup> In fulfilling the humanities and social science requirements (HSS), students must take a total of at least twenty-four units in the arts, humanities, and social sciences, not including subjects such as accounting, industrial management, finance, or personnel administration. Nine or ten HSS courses are listed here; individual college requirements may be higher.

### AEROSPACE ENGINEERING

FALL	WINTER	SPRING
<b>FRESHMAN YEAR</b>		
Math. 2A*	Math. 2B*	Math. 2C*
AMES 10	Phys. 2A*	Phys. 2B*/2BL
Chem. 6A* <sup>2</sup>	Chem. 6B/6BL	AMES 11
HSS <sup>1</sup>	HSS	HSS
<b>SOPHOMORE YEAR</b>		
Math. 2DA	Math. 2EA	Math. 2F
Phys. 2C/2CL	AMES 15	AMES 110
AMES 121A	AMES 121B	AMES 130A
HSS	HSS	HSS
<b>JUNIOR YEAR</b>		
AMES 163A	AMES 102	AMES 121C
AMES 130B	AMES 154	AMES 170
AMES 101A	AMES 101B	AMES 101C
AMES 105A	HSS	HSS
<b>SENIOR YEAR</b>		
HSS	AMES 159	HSS
AMES 104†	AMES 175A†	AMES 175B†
ECE 171A	AMES 142†	TE
AMES 137	AMES 155A†	AMES 155B†

\* Six of the eight courses used to compute the performance index upon which pre-engineering majors are admitted to the major at the end of the freshman year. Of the other two courses used in this computation, one must be in engineering and one must be in engineering, science, or mathematics.

<sup>1</sup> In fulfilling the humanities and social science requirements (HSS), students must take a total of at least twenty-four units in the arts, humanities, and social sciences, not including subjects such as accounting, industrial management, finance, or personnel administration. Ten HSS courses are listed here, individual college requirements may be higher.

<sup>2</sup> Chem. 7A-B sequence may be taken in place of Chem. 6A-B.

† Not offered in 1992-93.

## TWO-YEAR UPPER-DIVISION PROGRAM IN APPLIED SCIENCE

### Lower-Division Program Preparation

#### Computer Programming

AMES 10

#### Mathematics

Math. 2A\*, 2B\*, 2C\*, 2DA, 2EA, 2F

#### Physics

Phys. 2A\*, 2BL, 2B\*, 2C, 2CL  
or 3A\*, 2BL, 3B\*, 3C, 2CL

#### Chemistry

Chem. 6A\*, 6B, 6BL  
or 7A\*, 7B, 6BL

#### Biology

Biol. 1†

\* Six of the eight courses used to compute the performance index upon which pre-engineering majors are admitted to the major at the end of the freshman year. Of the other two courses used in this computation, one must be in engineering and one must be in engineering, science, or mathematics.

† Required only for bioengineering majors and/or Revelle College students.

### Upper-Division Major Requirements APPLIED MECHANICS<sup>1</sup>

FALL	WINTER	SPRING
<b>JUNIOR YEAR</b>		
AMES 105A	Math. 120A	Math. 183
AMES 121A	AMES 121B	AMES 130A
AMES 154	AMES 163A	AMES 170
HSS <sup>2</sup>	HSS	HSS
<b>SENIOR YEAR</b>		
AMES 101A	AMES 101B	AMES 101C
AMES 130B	AMES 130C <sup>3</sup>	AMES 121C
AMES 158	AMES 110	HSS
HSS	AMES 171A	HSS

<sup>1</sup> Students in these programs of study may obtain either the B.A. or B.S. in applied science (applied mechanics or bio-engineering: premedical). The difference between receiving the B.A. or B.S. depends on the total number of units the student completes: the B.A. requires 180 units, the B.S. requires 192 units. To obtain the B.S. degree, the additional unit requirement must be accomplished with technical electives.

<sup>2</sup> Humanities and social science (HSS) courses should be selected to meet general-education requirements of the colleges. Individual college requirements may be higher than what is listed here.

<sup>3</sup> With departmental approval, AMES 130C may be replaced by either AMES 132A or AMES 133.

### BIOENGINEERING: PREMEDICAL<sup>1</sup>

FALL	WINTER	SPRING
<b>JUNIOR YEAR</b>		
AMES 181	AMES 182A	AMES 182B
Chem. 140A <sup>2</sup>	Chem. 140B	AMES 170
Chem. 143A	Biol. 131	Biol. 101
HSS	HSS	HSS
<b>SENIOR YEAR</b>		
Biol. 156A	Biol. 151	Biol. 153
AMES 103A	AMES 103B	AMES 174
TE <sup>3</sup>	TE	TE
HSS	HSS	HSS

<sup>1</sup> Students in these programs of study may obtain either the B.A. or B.S. in applied science (applied mechanics or bio-engineering: premedical). The difference between receiving the B.A. or B.S. depends on the total number of units the student completes: the B.A. requires 180 units, the B.S. requires 192 units. To obtain the B.S. degree, the additional unit requirement must be accomplished with technical electives. Humanities and social science (HSS) courses should be selected to meet general-education requirements of the colleges. Individual college requirements may be higher than what is listed here.

<sup>2</sup> Chem. 6C is a prerequisite for Chem. 140A and must be taken in the freshman or sophomore year. Chem. 140C is a requirement for application to many medical schools.

<sup>3</sup> Technical elective (TE) courses must be upper-division or graduate courses in the engineering sciences, natural sciences or mathematics, selected with **prior** approval of the department.

**POLICIES AND PROCEDURES FOR AMES UNDERGRADUATE STUDENTS**

**APPLICATION FOR ADMISSION TO THE MAJOR**

Because of the heavy student interest in AMES programs and the limited resources available to accommodate this demand, maintenance of a quality educational program makes it necessary to limit enrollments to the most qualified students. Admission to the department as an AMES major or minor, or to fulfill a major in another department which requires AMES courses, is in accordance with the general requirements established by the Division of Engineering. The admission requirements and procedures are described in detail in the section on "Admission to the Division of Engineering" in this catalog. Applicants who have demonstrated excellent academic performance prior to being admitted to UCSD will be admitted directly to the engineering major of their choice. Students not admitted directly to an engineering major are identified as pre-engineering majors and may be admitted by petition to the department. The Undergraduate Affairs Committee judges these petitions, taking into consideration the student's entire academic record. Pre-engineering majors who have achieved an average GPA of 3.0 or better in the eight required pre-engineering courses by the end of the freshman year are assured of admission. Pre-engineering majors whose GPA is less than 3.0 may inquire at the departmental advising office about current minimum GPA requirements in effect for each major, which may vary due to enrollment. Students not admitted to a major by the end of the freshman year must apply, or reapply in the case of denial, before the end of the sixth quarter of study at UCSD. It is expected that students have completed or have in progress all eight prerequisite courses when applying.

**TRANSFER STUDENTS**

Transfer students may apply for admission to either the applied science or engineering program. Requirements for admission as an AMES major or minor, or into AMES courses, are the same for transfer students as they are for continuing students (see section on "Admission to the Division of Engineering" in this catalog). Accordingly, when planning their program, transfer students should be mindful of lower-division prerequisite course requirements upon which admission to the major is based, as well as for meeting collegiate requirements.

Students who have taken equivalent courses elsewhere may request to have transfer credit apply toward the department's major requirements. This is accomplished by submitting a petition for transfer credit together with a transcript and catalog course description from the institution where the course(s) were taken. These documents are reviewed for approval by AMES' Undergraduate Affairs Committee. Transfer petitions are available from the Student Affairs Office. Transfer students must apply for admission before the end of the third quarter of study at UCSD and must have completed at least three required pre-AMES or AMES courses, one of which must be an upper-division course.

**ACADEMIC ADVISING**

Upon admission to the major, students must make an appointment with the undergraduate adviser in AMES' Student Affairs Office to plan a program of study. The program plan may be revised in subsequent years, but revisions involving curricular requirements require approval by the undergraduate adviser or the Undergraduate Affairs Committee. Because some course and/or curricular changes may be made every year, it is imperative that students consult with the department's undergraduate adviser on an annual basis.

Most AMES courses are offered only once a year and therefore should be taken in the recommended sequence. If courses are taken out of sequence, it may not always be possible to enroll in courses as desired or needed. If this occurs, students should seek immediate departmental advice. When a student deviates from the sequence of courses specified for each curriculum in this catalog, it may be impossible to complete an AMES major within the normal four-year period.

In addition to the advising available through the Student Affairs Office, programmatic or technical advice may be obtained from AMES faculty members. A specific AMES faculty adviser is assigned to each student upon admission to the major. Pre-engineering majors can obtain programmatic advice from the Student Affairs Office.

**PROGRAM ALTERATIONS/ EXCEPTIONS TO REQUIREMENTS**

Variations from or exceptions to any program or course requirements are possible only if a petition is approved by the AMES Undergraduate Affairs Committee *before* the courses in question are taken. Petition forms may be obtained from the AMES Student Affairs Office and must be processed through this office.

**INDEPENDENT STUDY**

AMES students may take AMES 199, Independent Study for Undergraduates, under the guidance of an AMES faculty member. Normally, this course is taken as an elective on a P/NP basis. Under very restrictive conditions, however, it may be used to satisfy upper-division technical elective course requirements for the major. Students interested in this alternative must identify a faculty member with whom they wish to work and propose a two-quarter research or study topic. After obtaining the faculty member's concurrence on the topic and scope of the study, the student must submit a Special Studies Course form (each quarter) and an AMES 199 as Technical Elective Contract form to the Undergraduate Affairs Committee. These forms must be completed, approved, and processed **prior** to the beginning of the quarter in which the course is to be taken. This should not be done during the add/drop period. Detailed policy in this regard and the requisite forms may be obtained from the Student Affairs Office.

**TEACHING**

Students interested in participating in the instructional activities of the department may take AMES 195, Undergraduate Teaching. Normally, this course is taken as an elective on a P/NP basis. Under very restrictive conditions, it may be used to satisfy upper-division technical elective course requirements for the major. Policy in this regard and the appropriate forms may be obtained from the Student Affairs Office.

**EARLY ADMISSION TO THE M.S. DEGREE — A COMBINED B.S./ M.S. PROGRAM**

Upper-division students who have three quarters of residence at UCSD, with a grade-point average of 3.5 or better, may apply for "early admission" to the department's M.S. program. Qualified students should apply at the beginning of the spring quarter of the junior year. Upon successful completion of the B.S. requirements with an overall grade-point average of at least 3.0, students who have been accepted are guaranteed admission to the AMES graduate program leading to the M.S. degree. This procedure is designed to allow students in consultation with their advisers to develop a five-year program of study, leading to both the B.S. and M.S. degrees, in which both undergraduate and graduate courses are taken during the fourth and fifth years. For students wishing to pursue the M.S. degree, this program has the advantage of allowing students to develop an in-depth specializa-



tion or to broaden their education while having considerable flexibility in course scheduling. At the end of any quarter in which the B.S. requirements are fulfilled, the student is automatically considered a graduate student, and all appropriate courses which have not been used to satisfy the requirements for the B.S. degree are applied toward the requirements for the M.S. degree (see section on "Master's Degree Program" in this catalog).

## THE GRADUATE PROGRAM

The Department of Applied Mechanics and Engineering Sciences offers graduate instruction leading to the **M.S. and Ph.D. degrees in engineering sciences** with a designated specialization in each of the following areas: aerospace engineering, applied mechanics, applied ocean sciences, chemical engineering, bioengineering, engineering physics, mechanical engineering, and structural engineering.

Admission is in accordance with the general requirements of the graduate division, which typically requires a B.S. and/or M.S. degree in some branch of engineering, the physical sciences, or mathematics; a minimum GPA of 3.0; and strong letters of recommendation. In addition, the department requires *all* applicants to submit GRE General Test scores, and TOEFL scores are required from international applicants whose native language is not English. Applicants are judged competitively. Based on the candidate's background, qualifications, and goals, admission to the program is in one of three categories: M.S. *only*, M.S., or Ph.D. Admission for the M.S. *only* is designated when the applicant's prior academic qualifications are judged to be marginal; admission for the M.S. or Ph.D. is designated when the applicants are judged to be appropriately qualified to pursue the degree requested at the time of application. These admission designations are important for master's students who subsequently wish to continue in the Ph.D. program. Policy in this regard is given under the "Master's Degree Program" below.

Students are welcome to seek enrollment in AMES courses via UC Extension's concurrent registration program, but an extension student's enrollment in an AMES graduate course must be approved by the instructor.

## MASTER'S DEGREE PROGRAM

The M.S. program is intended to extend and broaden an undergraduate background and/or equip practicing engineers with fundamental knowledge in their particular fields. The degree

may be terminal, or obtained on the way to the Ph.D. The degree is offered under both the Thesis Plan I and the Comprehensive Examination Plan II (see "Graduate Studies: Master's Degree"). A strong effort is made to schedule M.S.-level course offerings so that students may obtain their M.S. degree in one year of full-time study or two years of part-time study.

**Course requirements** are flexible in the applied mechanics, chemical engineering, and engineering physics programs (see sample program below). Course requirements for the aerospace engineering, mechanical engineering, and structural engineering programs are outlined in the M.S. program charts below. (Bioengineering and applied ocean sciences students have specific core course requirements; see below for details.) Specific departmental requirements for the M.S. degree are as follows:

**Thesis Plan I:** This plan of study involves both course work and research, culminating in the preparation of a thesis. A total of forty-eight units of credit is required: forty units (ten courses) must be in course work, and eight units must be in research. The student's program is arranged, with prior approval of the faculty adviser, according to the following policies:

1. Course work must include sixteen units (four courses) of AMES 200-level courses.
2. Units obtained in AMES 206, 259, 281, or 299 may not be applied toward the course work requirement.
3. No more than a total of eight units of AMES 296 and 298 may be applied toward the course work requirement.
4. No more than twelve units of upper-division 100-level courses may be applied toward the course work requirement.
5. Eight units of AMES 299 must be taken to fulfill the research requirement.

Students must maintain at least a B average in the courses taken to fulfill the degree requirements. A thesis based on the research is written and subsequently reviewed by the thesis adviser and two other faculty members appointed by the dean of Graduate Studies. The review is normally an oral defense of the thesis.

**Comprehensive Examination Plan II:** This plan of study involves course work only and culminates in a comprehensive examination. A total of forty-eight units of credit (twelve courses) is required. The student's program is arranged, with prior approval of the faculty adviser, according to the following policies:

1. At least sixteen units (four courses) must be AMES 200-level courses.

2. Units obtained in AMES 206, 259, 281, or 299 may not be applied toward the degree requirements.

3. No more than a total of eight units of AMES 296 and 298 may be applied toward the degree requirements.

4. No more than twelve units of upper-division 100-level courses may be applied toward the degree requirements.

Students must maintain at least a B average in the courses taken to fulfill the degree requirements. The comprehensive examination is conducted by the adviser and at least two other faculty members. The examination committee normally conducts an oral examination in the candidate's area of specialization. A student working toward the Ph.D. degree who has successfully passed one area of the department's Ph.D. examination need not take the comprehensive examination for the M.S. degree.

**Bioengineering students** are required to take the bioengineering core graduate courses—AMES 271A-B-C and AMES 272, 273, 278A—and pass with a grade of B or better. A new graduate student who does not meet the prerequisites of these core courses may have to take some basic courses to make up the deficiency. Thus, a student deficient in mathematics and mechanics may have to take Math. 110, AMES 103B, 181, 182A-B in the first year and AMES 272, 273, 278A in the second year. A student deficient in biology and chemistry may have to take Chemistry 126 or 131 and Biology 151, 153 in the first year and AMES 271A-B-C in the second year.

**Applied ocean sciences students** are expected to demonstrate proficiency in mathematics and oceanography. Accordingly, when planning course programs they should enroll in AMES 294A-B-C (Methods in Applied Mechanics) and in some of the Scripps core courses, such as 210A (Physical Oceanography), 240 (Marine Chemistry), and 270A (Biological Oceanography).

**Change of Degree Aim.** Upon completion of the requirements for the M.S. degree, students admitted as M.S. *only* or M.S. candidates are not automatically eligible for admission to the Ph.D. program.

M.S. *only* candidates who subsequently wish to pursue a doctorate must submit an application for a change in status to the Committee on Graduate Affairs (CGA). The committee will appoint three AMES faculty to examine the applicant in one mutually agreed-upon and well-defined topic. The results of this examination, together with any other relevant information, e.g., the



student's graduate record, will form the basis for a positive or negative recommendation to the CGA. If the recommendation is positive and the request approved, the student must submit a general petition for graduate students to effect the change of status. In addition, the examining committee may recommend that the examination satisfy one of the four topics required in the departmental qualifying examination for the doctorate.

M.S. candidates who subsequently wish to pursue a doctorate must also submit an application for a change in status to the Committee on Graduate Affairs. In this case, a special examination is not required. The application, however, must be approved and signed by an AMES faculty member who expects to serve as the student's Ph.D. adviser. When the request is approved, the student must submit a general petition for graduate students to effect the change of status. If the student elects the comprehensive examination plan for the M.S. degree, this examination may be used not only to fulfill the requirement for the M.S. degree but also to satisfy one of the four topics required in the departmental qualifying examination for the doctorate. In fact, the M.S. examination may be part of the doctoral examination.

### M.S. PROGRAM IN AEROSPACE ENGINEERING

To obtain an M.S. degree with specialization in aerospace engineering, students must select any four of the following five sequences of classes.

FALL	WINTER	SPRING
Fluid Mechanics 210A	Fluid Mechanics 210B	Fluid Mechanics 210C
Foundations of Solid Mechanics 231A	Elasticity 231B	Anelasticity 231C
Numerical Methods in Engineering Science 290	Computational Fluid Dynamics 223 or Finite-Element Methods Solid Mechanics 232	Design and Mechanics in Computer Technology 291 or Computer-aided Analysis and Design 292
Statistical Thermodynamics 220A	Introductory Compressible Flow 212A	Mechanics of Propulsion 213
ECE 171A or ECE 176A or ECE 271A or ECE 273A	ECE 171B or ECE 176B or ECE 271B or ECE 273B	ECE 176C or ECE 271C or ECE 273C

NOTE: Not all courses are offered every year.

### M.S. PROGRAM IN MECHANICAL ENGINEERING

FALL	WINTER	SPRING
Foundations of Solid Mechanics 231A or Fluid Mechanics 210A	Elasticity 231B or Fluid Mechanics 210B	Anelasticity 231C or Fluid Mechanics 210C
Numerical Methods in Engineering Science 290	Finite Element Methods in Solid Mechanics 232 or Computational Fluid Dynamics 223	Design and Mechanics in Computer Technology 291 or Computer-aided Analysis and Design 292
Materials Science <sup>1</sup>	TE <sup>2</sup>	TE <sup>2</sup>
ECE 171A or ECE 176A or ECE 271A or ECE 273A	ECE 171B or ECE 176B or ECE 271B or ECE 273B	ECE 176C or ECE 271C or ECE 273C

NOTE: Not all courses are offered every year.

<sup>1</sup> To be selected from graduate course offerings in Materials Science.

<sup>2</sup> AMES graduate courses selected in consultation with adviser.

### M.S. PROGRAM IN STRUCTURAL ENGINEERING\*

FALL	WINTER	SPRING
Foundations of Solid Mechanics 231A	Elasticity 231B	Anelasticity 231C
Advanced Structural Analysis 230 or Theory of Shells 235A	Structural Stability 236 or Theory of Shells 235B	Structural Dynamics 237
Advanced RC/PC Design 240 or Mechanics of Composite Materials 233A	Bridge Design 242 or Micromechanics 233B	Earthquake Engineering 239 or Fracture Mechanics 233C
Applied Mathematics 105A or 294A	Finite Element Methods in Solid Mechanics 232	Experimental Mechanics 234 or Independent Study 296

\*Includes civil structures and aerospace and marine structures.  
NOTE: Not all courses are offered every year.

### DOCTORAL DEGREE PROGRAM

The AMES Ph.D. program is intended to prepare students for a variety of careers in research and teaching. Therefore, depending on the student's background and ability, research is initiated as soon as possible. In general, there are no formal course requirements for the Ph.D. (Bioengineering and applied ocean sciences students do have specific core course requirements; see below for details.) All students, in consultation

with their advisers, develop course programs that will prepare them for the AMES Departmental Qualifying Examination and for their dissertation research. However, these programs of study and research must be planned to meet the time limits established to advance to candidacy and to complete the requirements for the degree. Specific details in this regard can be obtained from AMES' Student Affairs Office.

**Bioengineering students** are required to take the bioengineering core graduate courses — AMES 271A-B-C and AMES 272, 273, 278A — and pass with a grade of B or better. A new graduate student who does not meet the prerequisites of these core courses may have to take some basic courses to make up the deficiency. Thus, a student deficient in mathematics and mechanics may have to take Math. 110, AMES 103B, 181, 182A-B in the first year and AMES 272, 273, 278A in the second year. A student deficient in biology and chemistry may have to take Chemistry 126 or 131 and Biology 151, 153 in the first year and AMES 271A-B-C in the second year.

**Applied ocean sciences students** are expected to demonstrate proficiency in mathematics and oceanography. Accordingly, when planning course programs they should enroll in AMES 294A-B-C (Methods in Applied Mechanics) and in some of the Scripps Core Courses, such as 210A (Physical Oceanography), 240 (Marine Chemistry), and 270A (Biological Oceanography).

**Doctoral Examinations:** An AMES Ph.D. student is required to pass three examinations. The first is a **Departmental Qualifying Examination** which should be taken within three to six quarters of full-time graduate study. This examination is intended to determine the candidate's ability to pursue successfully a research project at a level appropriate for the doctorate. It is administered by at least four faculty, three of whom must be in AMES. Although the student may elect to satisfy one examination area by course work, he or she is responsible for four areas. In order to insure appropriate breadth, the areas are sub-divided into two which are closely related to the student's research interests and two others which are peripheral thereto. Since the examination areas must be approved by the department's Committee on Graduate Affairs, students are advised to seek such approval well before their expected examination date, preferably while planning their graduate studies. Although students are not required to take particular courses in preparation for the departmental examination, the scope of the examination in each area is associated with a set of graduate courses, generally AMES courses. Thus a candidate can develop a

sense of the level of knowledge expected to be demonstrated during the examination by studying the appropriate syllabi and/or discussing the course content with faculty experienced in teaching the courses involved.

The **Teaching Experience Requirement** is required of all AMES Ph.D. students prior to taking the Senate Qualifying Exam. The teaching experience is defined as lecturing one hour per week in either a problem-solving section or regular lecture for one quarter in a course designated by the department. The requirement can be fulfilled by teaching assistant service or taken as a course for academic credit. Students must contact the Student Affairs Office to plan for completion of this requirement.

The **Senate Qualifying Examination** is the second examination required of AMES Ph.D. students, and it must be taken no later than four years from the first quarter of registration. It is administered by a committee appointed by the dean of Graduate Studies and Research and consists of both AMES faculty and faculty from other departments. The examination is taken after the student and his or her adviser have identified a topic for his or her dissertation research and initial progress has been made. The candidate is expected to describe his or her accomplishments to date and plans for future work (see "Graduate Studies: the Ph.D.>").

The **Dissertation Defense** is the final Ph.D. examination. As implied, the candidate is expected to describe and defend the main accomplishments of his or her research. The total length of time allowed to complete all requirements for the Ph.D. degree is normative time plus two years (see the "Graduate Studies" section in this catalog).

There is no formal foreign language requirement for doctoral candidates. Students are expected to master whatever language is needed for the pursuit of their own research.

### CANDIDATE IN PHILOSOPHY DEGREE

AMES Ph.D. students who have passed their Departmental and Senate Qualifying Examinations and have advanced to candidacy are awarded the Candidate in Philosophy degree (see "Graduate Studies: Candidate in Philosophy Degree").

### JOINT DOCTORAL PROGRAM WITH SAN DIEGO STATE UNIVERSITY

The Department of Applied Mechanics and Engineering Sciences at UCSD participates in a joint doctoral program with the Graduate Group

in Applied Mechanics at SDSU. The program leads to the degree of doctor of philosophy in engineering sciences (applied mechanics). Participants in the program are required to spend one year enrolled at UCSD; their dissertation research is carried out under the supervision of an SDSU faculty member.

Information regarding admission may be obtained from the departmental Student Affairs Office.

## Courses

*All students enrolled in AMES courses or admitted to an AMES program (including premajors) are expected to meet prerequisite and performance standards, i.e., students may not enroll in any AMES courses or courses in another department which are required for the major prior to having satisfied prerequisite courses with a C- or better. (The department does not consider D or F grades as adequate preparation for subsequent material.) Additional details are given under the various program outlines, course descriptions, and admission procedures for the Division of Engineering in this catalog. Furthermore, the majority of AMES courses have enrollment restrictions which give priority to or are open only to declared pre-engineering students and/or to students who have been admitted to an AMES major. Where these restrictions apply, the registrar will not enroll other students except by department stamp on class enrollment cards. The department expects that students will adhere to these policies of their own volition and enroll in courses accordingly. Students are advised that they may be dropped at any time from course rosters if prerequisites and/or performance standards have not been met.*

### LOWER DIVISION

#### 5. Quantitative Computer Skills (4)

Introductory course for nonengineering majors. Use of computers in solving problems; applications from life science, physical science, and engineering. Students run existing computer programs and complete some programming in BASIC. (F,W,S)

#### 10. FORTRAN for Engineers (4)

FORTRAN 77 computer programming language and its application to the solution of numerical problems. Command and editing in the interactive mode. Emphasis on good programming practices. Priority enrollment given to pre-engineering and engineering majors. (F)

#### 11. Elements of Materials Science (4)

The structure of engineering materials (metals, ceramics, glasses, semiconductors, superconductors, and polymers) and how these structures can be controlled to produce desired, useful properties. Mechanical, electrical, optical, superconducting, and magnetic properties will be discussed. *Prerequisites:*

*Chem. 6A, Phys. 2A or 3A, Math. 2A-B, and Math. 2C (or concurrent enrollment).* Priority enrollment given to pre-engineering and engineering majors. (S)

#### 15. Introduction to Engineering Graphics and Design (4)

Introduction to the basic principles and language of engineering graphics and design. Weekly computer graphics laboratory sessions, along with free-hand and instrument drawing. Graphics topics include sketching; lettering, and dimensioning; orthographic, oblique, and axonometric projections; perspective. Lectures and readings on engineering design, including basic design concepts and case histories of design projects. *Prerequisites: AMES 10 or concurrent enrollment.* Priority enrollment given to pre-engineering and engineering majors. (W)

#### 90. Undergraduate Seminar (1)

Selected topics of interest to the faculty will be used to introduce students to engineering science concepts. (Not open to upper-division engineering students.) (F,W,S)

### UPPER DIVISION

#### 101A-B. Introductory Fluid Mechanics (4-4)

Hydrostatics with application to submerged surfaces and structure of atmospheres. Bernoulli's equation, its extension and application. Integral momentum and energy theorems, similitude and dimensional analysis. Potential flow, boundary layers, compressible flow including shock waves, generalized one-dimensional flow. *Prerequisites: admission to the major and grades of C- or better in Phys. 2A, Math. 2DA, 2F.* Enrollment in 101B requires grades of C- or better in AMES 101A and AMES 110 (or concurrent enrollment). (F,W)

#### 101C. Heat Transfer (4)

Extension of AMES 101A-B to viscous, heat-conducting flows. Application of the energy conservation equation to heat transfer ducts and external boundary layers. Introduction to heat conduction and radiation transfer. Calculation of heat coefficients in forced and free convection. Design applications and heat exchanges. *Prerequisites: admission to the major and AMES 101A-B with grades of C- or better.* (S)

#### 102. Mechanical Behavior of Materials (4)

Mechanical tests, elasticity and anelasticity, dislocations and microplasticity of crystals, plastic deformation and creep, fracture and strengthening mechanisms, ceramics and other inorganic nonmetallics, polymers. Laboratory demonstrations of selected topics. *Prerequisites: grades of C- or better in AMES 11.* Priority enrollment given to pre-engineering and engineering majors. (W)

#### 103A. Introductory Fluid Mechanics (4)

Equations of motion; non-Newtonian fluids; hydrostatics; Bernoulli's equation; viscous flows; turbulence, applications to chemical engineering, bioengineering, and structural engineering. (Students may not receive credit for both AMES 101A and AMES 103A; priority enrollment will be given to bioengineering, chemical engineering, and structural engineering majors.) *Prerequisites: admission to the major and grades of C- or better in Phys. 2A and Math. 2DA, 2F.* (F)

#### 103B. Mass Transfer (4)

Diffusive and convective mass transfer in solids, liquids, and gases; steady and unsteady state; mass transfer coefficients; applications to chemical engineering and bioengineering. (Priority enrollment will be given to bioengineering and chemical engineering majors.) *Prerequisites: admission to the major and AMES 103A or 101A with grade of C- or better.* (W)

#### 103C. Heat Transfer (4)

Conduction, convection, radiation heat transfer; design of heat exchangers. (Students may not receive credit for both AMES 101C and AMES 103C; priority enrollment will be given to chemical engineering majors.) *Prerequisites: admission to the*

major and grades of C— or better in AMES 103A-B or AMES 101A-B. (S)

**104. Aerodynamics (4)**

Basic relations describing flow field around wings and bodies at subsonic and supersonic speed. Thin-wing theory. Slender-body theory. Formulation of theories for evaluating forces and moments on airplane geometrics. Application to the design of high-speed airplanes. *Prerequisites:* admission to the major and grade of C— or better in AMES 101A-B. (Not offered in 1992-93.)

**105A-B-C. Introduction to Mathematical Physics (4-4-4)**

Ordinary differential equations, Fourier series. Sturm-Liouville theory, elementary partial differential equations, complex variables, and integral transforms with applications to problems in particle and rigid-body dynamics, vibrations, wave motion, electric circuits, heat conduction, and fluid dynamics. (Students may not receive credit for both AMES 105A-B-C and ECE 105A-B-C.) *Prerequisites:* admission to the major and grades of C— or better in Phys. 2A-B and Math. 2DA. Enrollment in 105B-C requires grades of C— or better in 105A-B. (F)

**110. Thermodynamics (4)**

First and second laws and selected applications, e.g., thermochemistry, heat capacities and heats of reaction, engine cycles, etc. *Prerequisites:* grades of C— or better in Phys. 2A and Chem. 6B or 7B (or concurrent enrollment). Priority enrollment given to pre-engineering and engineering majors. (W,S)

**111. Chemical Engineering Thermodynamics (4)**

Thermodynamic behavior of pure substances and mixtures. Properties of solutions, phase equilibria. Thermodynamic cycles. Chemical equilibria for homogeneous and heterogeneous systems. *Prerequisites:* admission to the major and grade of C— or better in Chem. 126. (W)

**112. Separation Processes (4)**

Principles of analysis and design of systems for separation of components from a mixture. Topics will include staged operations (distillation, liquid-liquid extraction), and continuous operations (gas absorption, membrane separation) under equilibrium and nonequilibrium conditions. *Prerequisites:* admission to the major and grades of C— or better in Chem 126, 127, 128, and AMES 103A-B-C. (F)

**113A. Chemical Reaction Engineering (4)**

Principles of analysis and design of chemical reactors with emphasis on homogeneous reactions. Treatment of kinetic data, design of batch and continuous reactors, nonisothermal effects, selectivity considerations, residence time distribution. *Prerequisites:* admission to the major and grades of C— or better in Chem. 126, 127, 128 and AMES 103A-B-C. (F)

**113B. Chemical Reaction Engineering (4)**

Introduction to heterogeneous chemical reactions, including heterogeneous catalysis, heat and mass transfer effects. Strong emphasis on numerical simulation and computer-aided design of chemical reactors. *Prerequisites:* admission to the major and grades of C— or better in AMES 112, 113A, 140 and concurrent enrollment in AMES 115. (W)

**114. Plant and Process Design (4)**

Engineering and economic analysis of integrated chemical processes, equipment, and systems. Cost estimation, heat and mass transfer equipment design and costs. Integrated plant design. Optimal design. Profitability. *Prerequisites:* admission to the major and grades of C— or better in AMES 112 and 113A-B. (S)

**115. Computer-Aided Design of Chemical Processes (4)**

Introduction to techniques for computer-aided analysis of chemical processing systems. Development of mathematical models to describe dynamic and steady-state process behavior. Representation of the structure of complex, interconnected chemical processes with arbitrary recycle stream. Numerical

methods for solving resulting systems of nonlinear differential and algebraic equations. *Prerequisites:* admission to the major and grades of C— or better in AMES 112, 113A, and 153. (W)

**119A. Energy: Demands, Resources, Impact, Technology, and Policy (4)**

Past and estimated future energy demands. Renewable and nonrenewable energy resources. Economic impact of energy use. Geophysical impact of energy use. Energy conservation in manufacturing, transportation, home use. Energy policy. *Prerequisites:* grades of C— or better in Math. 2A-B-C-D, Phys. 2A-B-C, and Chem. 6A-B. (F)

**119B. Energy: Non-Nuclear Energy Technologies (4)**

Oil recovery from tar sands and oil shale. Coal production, gasification, liquification. The hydrogen economy. Energy storage systems. Techniques for direct energy conversion. Solar energy utilization. Energy from windmills. Tidal and wave energy utilization. Hydroelectric power generation. Hydrothermal energy. Geothermal energy from hot rocks. Electrical power production, transmission, and distribution. *Prerequisite:* consent of instructor. (W)

**119C. Energy: Nuclear Energy Technologies (4)**

A brief survey of energy demands and resources. Available nuclear energy, physical background—thermal dynamics—atomic and nuclear physics; fission and fusion processes, physics of fission reactions—engineering aspects—safety and environmental effects, fusion, scaling laws, and start-up criteria—laser fusion, magnetic confinement—equilibrium instability. *Prerequisite:* consent of instructor. (S)

**121A. Mechanics I: Statics (4)**

Principles of statics for particles and rigid bodies. Three-dimensional equilibrium analysis with unit vector representation. Analysis of simple, statically determinate structures under discrete and distributed loading; hydrostatics, internal forces in beams. Virtual displacements and the principle of virtual work. Potential energy and stability of equilibrium. Lectures include methods of problem formulation and problem solution with application to realistic engineering problems. *Prerequisites:* Math. 2C and Phys. 2A or 3A with grades of C— or better. Priority enrollment given to pre-engineering and engineering majors. (F)

**121B. Mechanics II: Dynamics (4)**

Kinematics and kinetics of particles in three-dimensional vector representation; orbital mechanics. Work, energy and power for particle motion, conservative forces and conservation principles. Principle of impulse and momentum, impulsive motion and impact. Relative motion and conservation principles for systems of particles with variable mass; applications to fluid flow and rocket propulsion. Rigid body kinematics, rolling and sliding motions. Impact of rigid bodies. One-degree of freedom undamped vibrating systems resonance under sinusoidal excitation. Lectures include methods of problem formulation and problem solution with application to realistic engineering problems. *Prerequisites:* Math. 2DA and AMES 121A with grades of C— or better. Priority enrollment given to pre-engineering and engineering majors. (W)

**121C. Mechanics III: Vibrations (4)**

Free and forced vibrations of damped one-degree of freedom systems; vibration isolation, impact and packaging problems. Analysis of discrete multiple-degree of freedom systems using matrix representation; normal mode of frequencies and modal matrix formulation. Applications include response of buildings to ground motion. Lagrange's equations. Modal superposition for analysis of continuous vibrating systems. Problems of elastic bars and beams include free, impact-excited and sinusoidally forced vibrations. Lectures include methods of problem formulation and problem solution with application to realistic engineering problems. *Prerequisites:* admission to the major and grades of C— or better in Math. 2EA and AMES 121B. (S)

**130A. Solid Mechanics I (4)**

Mechanics of deformable bodies under axial, torsional, shearing, and bending loads. Problems of design for pressure vessels, circular shafts, thin-walled members, and standard rolled-steel shapes. *Prerequisites:* grades of C— or better in Phys. 2A-B-C, Math. 2DA-2EA, and AMES 121A. Priority enrollment given to pre-engineering and engineering majors. (S)

**130B. Solid Mechanics II (4)**

Continuum mechanics of solids and its application to the mechanical response of machine and structural elements. Stress and strain in indicial notation; field equations and constitutive relations. Linear elastic stress analysis in torsion, plane stress, and plane strain; stress concentrations; fracture mechanics. Extremum principles and structural stability. Viscoelasticity, plasticity, and failure criteria. Theorems of plastic limit analysis. *Prerequisites:* admission to the major and grades of C— or better in AMES 121B, 130A, and 105A (or concurrent enrollment). (F)

**130C. Solid Mechanics III (4)**

Linear and nonlinear one-dimensional theory of straight and curved beams. Small deflection theory of plates. Solutions for rectangular and circular plates. Buckling of rectangular plates. Large deflections and shear deformations. Energy methods and finite element method of analysis. *Prerequisites:* admission to the major and grade of C— or better in AMES 130B. (W)

**131A. Soil Mechanics (4)**

General introduction to physical and engineering properties of soils. Soil classification and identification methods. Soil exploration, sampling, and in-situ testing techniques. Permeability, seepage, and consolidation phenomena. Bearing capacity equations, stress distribution, and settlements. Lectures, three hours per week; lab, three hours per week. *Prerequisites:* admission to the major and grades of C— or better in AMES 130A-B. (W)

**131B. Foundation Engineering (4)**

Application of soil mechanics to the analysis, design, and construction of foundations for structures. Settlement of structures, bearing capacities of shallow and deep foundations; earth pressures on retaining structures and slope stability. *Prerequisites:* admission to the major and grade of C— or better in AMES 131A. (S)

**132A-B. Structural Analysis (4-4)**

Step-by-step development of computer codes for the analysis of civil, mechanical, and aerospace structures from the matrix formulation of the classic structural theory, through the direct stiffness formulation, to production-type structural analysis programs. *Prerequisites:* admission to the major and grade of C— or better in AMES 130A-B and AMES 154. (W,S)

**133. Finite Element Methods (4)**

Development of stiffness and mass matrices based upon variational principles and application to static, dynamic, and stability design problems in structural and solid mechanics. Architecture of computer codes for linear and nonlinear finite element analysis and basic computer implementation. The use of general purpose finite element structural analysis codes. *Prerequisites:* admission to the major and grades of C— or better in AMES 130A-B and 154; AMES 130C recommended. (F)

**134. Structural Design Principles—Application to Steel Structures (4)**

Design concepts and loadings for structural systems. Working stress and ultimate strength design theories. Properties of structural steel. Elastic design of tension members, beams, and columns. Design of bolted and welded concentric and eccentric connections. Introduction to plastic design. (Priority enrollment given to structural engineering majors.) *Prerequisites:* admission to the major and grade of C— or better in AMES 132A. (F)

**135. Analysis and Design of Reinforced Concrete Structures (4)**

Principles and general code provisions for reinforced concrete design. Concrete and reinforcement properties. Design of concrete members, including beams, slabs, and columns. Bond, anchorage, and detailing problems. Design, behavior, and serviceability of reinforced concrete structures. Introduction to seismic design principles. (Priority enrollment given to structural engineering majors.) *Prerequisites: admission to the major and grades of C- or better in AMES 132A-B and 134.* (W)

**136. Design of Prestressed Concrete Structures (4)**

Concept of prestressing. Materials and prestressing systems. Design of prestressed concrete members. Statically determinate and indeterminate structural systems. Prestress losses and time dependent effects. Application of prestressed concrete for buildings, bridges, and shells. Prestressing for the rehabilitation of structures. Determination of stress states and stronger design criteria. (Priority enrollment given to structural engineering majors.) *Prerequisites: admission to the major and grade of C- or better in AMES 135.* (S)

**137. Aerospace Structural Analysis (4)**

Aspects of structural analysis pertinent to the design of flight vehicles: aerodynamic/inertial loadings, aerospace laminated materials, elements of plate theory, aeroelastic divergence, introduction of matrix methods for structural dynamics and buckling. *Prerequisites: admission to major and grade of C- or better in AMES 121C and AMES 130A-B.* (W)

**139. Reliability of Engineering Systems (4)**

Introduction to probability and basic statistics. Analytical models for random phenomena and associated mathematical properties. Analysis and assessment of reliability. Probability-based design. Structural component and systems reliability. *Prerequisites: admission to the major and grades of C- or better in Math. 2C, 2F and AMES 132A-B.* (S)

**140. Chemical Process Dynamics and Control (4)**

Optimum steady-state design and control. Dynamical behavior of chemical process units such as chemical reactors, separation units, and heat exchangers. Examination of linear, linearized, and nonlinear process models. Stability analysis. Design of simple PID controllers. Bode diagrams and root locus techniques. Introduction to multivariable control systems. Cascade, modal, and feed-forward control. Selection of control and measurement variables. (Students may not receive credit for both AMES 140 and 141A.) *Prerequisites: admission to the major and grades of C- or better in AMES 163A and AMES 170.* (F)

**142. Flight Mechanics (4)**

Theory of flight, airfoil, lift, drag, applied aerodynamics. Static stability and its relation to airplane performance and design. The mathematics of translation and rotation in three-dimensions. Dynamic stability—general and simplified equations of motion. Stability derivatives. Characteristic longitudinal and lateral motions. Design of autopilots. *Prerequisites: admission to the major and grade of C- or better in AMES 104 and ECE 171A.* (Not offered in 1992-93)

**144A. Space Science and Engineering I (4)**

Introduction to space science. Earth, planetary atmospheres, especially upper atmospheres. Magnetospheres, energetic particles. Electromagnetic spectrum. Atmospheric attenuation, windows. Detection methods, instruments. Imaging systems, image processing. Observations from space. Newtonian mechanics of bound orbits. Science on manned, unmanned missions. *Prerequisites: upper-division standing in physics, chemistry, or engineering department.*

**144B. Space Science and Engineering II (4)**

Introduction to space engineering. Kinematics of rockets. Types of rocket engines. Relation of engine performance and rocket characteristics to mission phases—takeoff, on-orbit maneuvers, reentry, and landing. Space structures and materials, with

emphasis on new developments. Fabrication of structures from materials obtained in space. Communication systems: design characteristics, requirements, performance. Robotics and control. Tethers. Astrodynamics. *Prerequisites: upper-division standing in physics, chemistry, or engineering department.*

**151A-Z. Topics in Engineering Science (4)**

A course to be given at the discretion of the faculty in which topics of current interest in engineering will be presented by visiting or resident faculty members. *Prerequisite: admission to the major or consent of instructor.* (F,W,S)

**152. Topics in Engineering Design (4)**

A course to be given at the discretion of the faculty in which topics of current interest in applied engineering design will be investigated by resident faculty members or by practicing engineers. Priority enrollment for particular design courses may be given to students in the appropriate degree program. *Prerequisite: admission to the major or consent of instructor.* (F,W,S)

**153. Numerical Methods in Chemical Engineering (4)**

Introduction to elementary numerical methods and advanced FORTRAN programming, with applications to chemical engineering problems. Structured software strategy. Approximations and errors introduced in computations. Systems of linear equations and ordinary differential equations, root finding, finite difference, least square and spline fits. Concepts of mathematical modeling, material and energy balances of single and staged unit operations with applications to design problems. *Prerequisites: admission to the major and grades of C- or better in AMES 10, AMES 111, and Math. 2EA.* (S)

**154. Advanced FORTRAN Programming for Engineers (4)**

Review of FORTRAN 77, VAX command and editing, and good programming practices. Program construction at various levels of complexity beyond that of AMES 10, use of variables of all types and library programs. Applications to illustrate engineering problems. *Prerequisites: admission to the major and grades of C- or better in AMES 10 and Math. 2EA.* (Students may not receive credit for both AMES 154, Math. 74, and CSE 64.) (F,W)

**155A-B. Aerospace Engineering Design (4-4)**

Fundamental principles of design in aerospace engineering. Trade-off studies in aerospace design by application of pertinent technical areas, including structures, aerodynamics, propulsion, and flight mechanics. Project involving the preliminary design for an aircraft, spacecraft, or propulsion system. *Prerequisites: admission to the major and grade of C- or better in AMES 104, 137, AMES 142 and 159 may be taken concurrently.* (Not offered in 1992-93.)

**156A-B. Mechanical Engineering Design I, II (4-4)**

Fundamental principles of mechanical design. Application of engineering mechanics to the design of mechanical components. Design project involving a preliminary design for a realistic engineering application. (Priority enrollment given to mechanical engineering majors.) *Prerequisites: admission to the major and grades of C- or better in AMES 11 or 102, 15, 121A-B, and 130A.* Enrollment in 156B requires grades of C- or better in 156A and 158 (or concurrent enrollment). (W,S)

**157. Computer Graphics for Engineers and Scientists (4)**

Computer graphics algorithms studied using the C programming language and also by use of the computer-aided design software package AutoCAD. Applications in engineering and science. Topics include line-drawing algorithms, color, the user interface in CAD, spline curves and surfaces, 2-D and 3-D transformations, 3-D viewing, wireframe and solid models, and hidden-surface elimination. Weekly computer laboratory assignments plus a final graphics design project. *Prerequisites: admission to the major and grade of C- or better in AMES 15; college-level programming course in C, FORTRAN, or Pascal.* (F)

**158. Computer-Aided Analysis and Design (4)**

The use of computers for the design and analysis of engineering systems. *Prerequisites: admission to the major and grade of C- or better in AMES 130B or 181, 154, and concurrent enrollment in AMES 101A or AMES 103A.* (F,W)

**159. Fundamentals of Gas Turbines (4)**

Compressible flow, thermodynamics, and combustion relevant to gas turbine technology. Analysis and design of components of both stationary power plant turbines and turbines for aircraft propulsion, including compressors, turbines, inlets, combustion chambers, and nozzles. Design projects will include component matching. (Priority enrollment given to mechanical engineering majors.) *Prerequisites: admission to the major and grades of C- or better in AMES 110 or 111 and AMES 101A-B-C or 103A-B-C.*

**163A. Linear Circuits (4)**

Lumped circuits, Kirchhoff's laws, circuit elements, first and second order circuits, steady-state sinusoidal response; computational topics. *Prerequisites: admission to the major and grades of C- or better in Math. 2DA-2EA and Phys. 2A-B-C.* (F,W)

**163B. Linear Systems (4)**

Continuous-time and discrete-time signals and systems. Fourier analysis of periodic and aperiodic signals. The Fourier transform. Convolution. Frequency response. Solution of constant-coefficient linear differential equations by Laplace transforms. Difference equations. *Prerequisites: admission to the major and grades of C- or better in Math. 2EA and AMES 163A.* (W)

**170. Experimental Techniques (4)**

Principles and practice of measurement and control and the design and conduct of experiments. Technical report writing. Lectures relate to dimensional analysis, error analysis, signal-to-noise problems, filtering, data acquisition and data reduction, as well as background of experiments and statistical analysis. Experiments relate to the use of electronic devices and sensors. *Prerequisites: grade of C- or better in AMES 163A, and junior standing in major, and completion of all lower-division physics and chemistry labs required for each AMES major.* (S)

**171A-B. Mechanical Engineering Laboratory (4-4)**

Design and analysis of experiments in fluid and solid mechanics using large facilities, e.g., pipe flow systems, wind tunnels, water channels, vibration table, testing machines. Students operate facilities, obtain data; complete engineering analysis, and write major reports. (Priority enrollment given to mechanical engineering, engineering science, and applied mechanics majors.) *Prerequisites: grade of C- or better in AMES 170 and senior standing in major.* Enrollment in 171B requires a grade of C- or better in 101A or 103A. (W,S)

**173. Structures and Materials Laboratory (4)**

Introduction to instrumentation and testing techniques for structures under static and dynamic loads. Discussion of standard tension and compression tests for structural materials. Similitude relationships for structural models. Term project involving design, construction, testing, and data acquisition of a model structure. Preparation of a complete engineering report on the theory, design, and results of the term project. Observation and discussions of ongoing large-scale structural research projects in the Charles Lee Powell Structural Systems Laboratory. (Priority enrollment given to structural engineering majors.) *Prerequisites: grade of C- or better in AMES 170 and senior standing in the major.* (W)

**174. Bioengineering Laboratory (4)**

A laboratory course which demonstrates basic concepts of bioengineering design through experimental procedures involving humans and experimental animals. Statistical principles of experimental design. Study of possible errors. Experiments include nerve action, electrocardiography, mechanics of muscle, membranes, and noninvasive diagnostics in humans. (Priority



enrollment given to bioengineering majors.) *Prerequisites:* grade of C- or better in AMES 170 and senior standing in major. (S)

**175A-B. Aerospace Engineering Laboratory (4-4)**

Design and analysis of aerospace engineering experiments, using large facilities (as wind tunnels, testing machines, vibration tables, heat transfer apparatus) in areas related to mechanics, gas dynamics, thermodynamics, and heat transfer. Students propose and design experiments, complete engineering analysis, and write major reports. *Prerequisites:* admission to the major, a grade of C- or better in AMES 170, 101A-B, and senior standing in the major. (Not offered in 1992-93.)

**176A-B. Chemical Engineering Process Laboratory (4-4)**

Laboratory projects in the areas of applied chemical research and unit operations. Emphasis on applications of engineering concepts and fundamentals to solution of practical and research problems. Training in planning research projects, execution of experimental work, and articulation (both oral and written) of the research plan and results in the areas of applied chemical technology and engineering operations related to mass, momentum, and heat transfer. (Priority enrollment given to chemical engineering majors.) *Prerequisites:* 176A requires grades of C- or better in AMES 112, 113A, and 170. Enrollment in 176B requires grades of C- or better in 176A and 113B. (W,S)

**181. Continuum Mechanics (4)**

An introduction to continuum mechanics of both living and nonliving bodies. The laws of motion and free-body diagrams. Stresses. Deformation. Compatibility conditions. Constitutive equations. Properties of common fluids and solids. Derivation of field equations and boundary conditions. Applications to bioengineering design. *Prerequisites:* admission to the major and grades of C- or better in Phys. 2A-B-C or Phys. 3A-B-C. (F)

**182A. Biomechanics (4)**

Introduction to physiological systems, with emphasis on structure and function of major tissues and organs. Application of mechanics to understand the behavior of these tissues and organs at gross and microscopic levels. Design of surgical procedures and prosthetic devices. *Prerequisites:* admission to the major and grade of C- or better in AMES 181. (W)

**182B. Biomechanics (4)**

Bioviscoelastic fluids and solids. Non-Newtonian behavior of blood, synovial fluid, mucus, and protoplasm. Basic mechanical properties of collagen and elastin, bone, cartilage, muscles, blood vessels, and other living tissues. Application of continuum mechanics at great depth. Artificial implantable materials and design of prosthetic devices. *Prerequisites:* admission to the major and grade of C- or better in AMES 182A. (S)

**183. Biomedical Electronics and Electrical Engineering (4)**

Passive and active circuits. Semiconductors. Operational amplifiers. Nonlinear devices. Signals in continuous and discrete time systems. Modulation. Digital signal processing. Sampling. Noise. Digital filters. Computer design and use for biomedical instrumentation. Measurements and signal analysis in biological systems and medicine. *Prerequisites:* admission to the major and grade of C- or better in AMES 163A. (S)

**184A. Principles of Bioengineering Design I (4)**

General principles of electronics related to biomedical instrumentation. Basic circuits. Specialized amplifiers. Electrocardiography. Ultrasonic instruments. Electrical safety hazards. (Priority enrollment given to bioengineering and systems science majors.) *Prerequisites:* admission to the major and grade of C- or better in AMES 163A. (F)

**184B. Principles of Bioengineering Design II (4)**

Statistics applied to bioengineering design. Analytical approach to biological systems with emphasis on modeling, computer simulation. Biomedical problems will include fluid flow resistance, storage and compliance, use of transfer functions, impedance, various types of biological signals. *Prerequisites:* admission to the major and grades of C- or better in AMES 184A and AMES 105A (or concurrent enrollment). (W)

**184C. Principles of Bioengineering Design III (4)**

Biomaterials and artificial internal organs: an overview of the fundamentals of materials science as applied to medical engineering. Natural and synthetic polymers. Ceramics and metals. Phenomena occurring at the interface between implanted materials and the body. Illustration of these basic principles by examples from current research. *Prerequisites:* admission to the major and grades of C- or better in AMES 184A-B. (S)

**186. Bioengineering Design (4)**

Preparation of formal engineering reports on a series of engineering analysis and design problems illustrating methodology from various branches of applied mechanics as applied to bioengineering problems. (Priority enrollment given to bioengineering majors.) *Prerequisites:* admission to the major and grades of C- or better in AMES 103A-B, 121A-B, 130A, 154, 181, and AMES 105A. (S)

**195. Teaching (1-4)**

Teaching and tutorial assistance in an AMES course under supervision of instructor. Not more than four units may be used to satisfy graduation requirements. (P/NP grades only.) *Prerequisite:* B average in major and consent of department chair. (F,W,S)

**197. Engineering Internship (1-4)**

An enrichment program, available to a limited number of undergraduate students, which provides work experience with industry, government offices, hospitals and their practices. Subject to the availability of positions, students will work in a local industry or hospital (on a salaried or unsalaried basis) under the supervision of a faculty member and industrial supervisor. Coordination of the Engineering Internship is conducted through UCSD's Academic Internship Program. Time and effort to be arranged. Units may not be applied towards major graduation requirements unless prior approval of a faculty adviser is obtained and internship is an unsalaried position. *Prerequisites:* completion of ninety units with a 2.5 GPA and consent of AMES faculty coordinator. (F,W,S)

**198. Directed Group Study (1-4)**

Directed group study, on a topic or in a field not included in the regular department curriculum, by special arrangement with a faculty member. (P/NP grades only.) *Prerequisite:* consent of instructor. (F,W,S)

**199. Independent Study for Undergraduates (4)**

Independent reading or research on a problem by special arrangement with a faculty member. (P/NP grades only.) *Prerequisite:* consent of instructor. (F,W,S)

GRADUATE

**205. Graduate Seminar (0)**

Each graduate student in AMES is expected to attend a weekly seminar of his or her choice dealing with current topics in fluid mechanics, solid mechanics, bioengineering, systems science, applied ocean sciences, or energy. (S/U grades only.) (F,W,S)

**206. Physical Principles and Problems (1)**

Principles of applied science illustrated by problems in mechanics, dynamics, electricity, optics, thermodynamics, etc. Presentation of individual research. Preparation for interdepartment oral examination. (S/U grades only; course does not apply toward fulfillment of degree requirements.)

**207A-Z. Topics in Engineering Science (4)**

A course to be given at the discretion of the faculty in which topics of current interest in engineering will be presented. *Prerequisite:* consent of instructor.

**210A-B-C. Fluid Mechanics (4-4-4)**

Physical properties of fluids, kinematics; potential flow, wing theory; surface waves; Navier-Stokes equations; boundary layers; turbulence; heat and mass transfer. *Prerequisites:* AMES 101A-B and AMES 110, or consent of instructor.

**211. Introduction to Combustion (4)**

Fundamental aspects of flows of reactive gases, with emphasis on processes of combustion, including the relevant thermodynamics, chemical kinetics, fluid mechanics, and transport processes. Topics may include deflagrations, detonations, diffusion flames, ignition, extinction, and propellant combustion. *Prerequisites:* AMES 101A-B-C or AMES 103A-B-C, AMES 110, or consent of instructor.

**212. Introductory Compressible Flow (4)**

Equations of motion for compressible fluids; one-dimensional gas dynamics and wave motion, waves in supersonic flow, including oblique shock waves; flow in ducts, nozzles, and wind tunnels; methods of characteristics. *Prerequisites:* AMES 101A-B-C or AMES 103A-B-C, AMES 110, or consent of instructor.

**213. Mechanics of Propulsion (4)**

Fluid mechanics, thermodynamics, and combustion processes involved in propulsion of aircraft and rockets by air-breathing engines, and solid and liquid propellant rocket engines; characteristics and matching of engine components; diffusers, compressors, combustors, turbines, pumps, nozzles. *Prerequisites:* AMES 101A-B, AMES 110, or consent of instructor.

**214A. Introduction to Turbulence and Turbulent Mixing (4)**

Introductory concepts and definitions. Basic observations and experiments. Hydrodynamic stability. Kolmogoroff universal similarity hypotheses, length and time scales. Turbulent transport. Reynolds equations. Reynolds analogy. Dynamics of turbulence, kinetic energy, vorticity, temperature variance conservation. *Prerequisites:* AMES 101A-B-C or equivalent or consent of instructor.

**214B. Introduction to Turbulence and Turbulent Mixing (4)**

Universal similarity hypotheses of turbulent mixing; length, time, and scalar scales. Phenomenology of free shear flows and wall bounded flows. Statistical description of turbulence; transport, spectral dynamics, statistical geometry. *Prerequisite:* AMES 214A or equivalent or consent of instructor.

**220A. Physics of Gases (4)**

Thermodynamics of gases for use in gasdynamics. Derivation of thermodynamic functions from statistical mechanics. Applications of classical and quantum statistical mechanics to chemical, thermal, and radiative properties of gases. Equilibrium and nonequilibrium radiation, chemical equilibrium, and elements of chemical kinetics. Laser and reacting-flow applications. *Prerequisite:* AMES 110 or consent of instructor.

**220B. Physical Gasdynamics (4)**

Velocity distribution functions, the Boltzmann equation, moment equations and the Navier-Stokes equations. The dynamics of molecular collisions. The Chapman-Enskog expansion and transport coefficients: shear and bulk viscosity, heat conduction, molecular and thermal diffusion. Linearizations about equilibrium: applications to acoustics and supersonic flows with relaxation. *Prerequisites:* AMES 101A-B-C or AMES 103A-B-C, AMES 220A or consent of instructor.

**220C. Nonequilibrium Gasdynamics (4)**

Applications of thermodynamics, statistical mechanics, kinetic theory of gases and fluid mechanics to nonequilibrium flow problems. Shock structure. Chemical relaxation. Chemically re-



acting boundary layers. Ionized gases. Radiative heat transfer. *Prerequisite: AMES 220B or consent of instructor.*

## 221A-B-C. Heat and Mass Transfer (4-4-4)

Conduction, convection, and radiation heat transfer and mass transfer. Development of energy and species conservation equations. Analytical and numerical solutions to transport problems. Specific topics and applications may vary according to interests of instructor. (Not necessarily taught as a sequence nor offered every quarter.) *Prerequisites: AMES 101A-B-C or AMES 103A-B-C or consent of instructor.*

## 222A-B-C. Advanced Fluid Mechanics (4-4-4)

Contemporary problems in broad areas of fluid mechanics, e.g., turbulent flows, hydrodynamic stability, geophysical fluid dynamics, transport phenomena, acoustics, boundary layers, etc. (Not necessarily taught as a sequence nor offered every quarter.) *Prerequisites: AMES 210A-B-C or consent of instructor.*

## 223. Computational Fluid Dynamics (4)

Survey of numerical methods for fluid flow simulation with computer exercises. Emphasis varies with instructor. Ordinary differential equation models, e.g., boundary layer equations, Lorenz equations. Finite difference methods for simple wave equations. Spectral methods. Turbulence simulations. Vortex methods. Recent developments in CFD. *Prerequisite: AMES 101A or equivalent course or consent of instructor.*

## 226A-B-C. Advanced Engineering Physics (4-4-4)

Contemporary problems in many areas of engineering physics. Examples include combustion, quantitative spectroscopy and opacity calculations, relaxation phenomena and nonequilibrium flows, propagation of electromagnetic radiation through matter, laser theory and kinetics, advanced radiative heat transfer, laser-induced photochemistry, etc. *Prerequisites: AMES 220A-B-C or consent of instructor.*

## 230. Advanced Structural Analysis (4)

Applications of advanced analytical concepts to structural engineering problems. The course is designed to show and emphasize the physical nature of the finite element method in structural engineering. Effects of approximations in the discretization and the type of finite elements under consideration are evaluated. An introduction is given to the nonlinear behavior of structural systems focusing on basic concepts and computational techniques. *Prerequisites: Courses in structural analysis and finite element theory such as AMES 132 and AMES 133 or equivalent or consent of instructor.*

## 231A. Foundations of Solid Mechanics (4)

Specification of stress and strain; infinitesimal and finite deformation; conservation equations; typical constitutive equations; minimum potential energy principle. *Prerequisite: AMES 130B or consent of instructor.*

## 231B. Elasticity (4)

Basic field equations. Typical boundary value problems of classical linear elasticity. Problems of plane stress and plane strain. Variational principles. *Prerequisite: AMES 231A or consent of instructor.*

## 231C. Anelasticity (4)

Mechanical models of viscoelastic, plastic, and viscoplastic behavior in simple shear or uniaxial stress. Constitutive relations for three-dimensional states of stress and strain. Application to selected technological problems. *Prerequisite: AMES 231B or consent of instructor.*

## 232A-B-C. Finite Element Methods in Solid Mechanics (4-4-4)

Finite element methods for linear and nonlinear problems in solid mechanics. Basic methods and linear problems are discussed in the first quarter; dynamics, structural elements and material nonlinearities are discussed in the second quarter; and the third quarter emphasizes methods for problems with both material and geometrical (large deformations) nonlinearities.

*Prerequisites: graduate standing for 232A-B; AMES 231A for 232C.*

## 233A. Mechanics of Composite Materials (4)

Stiffness, strength, and thermal properties of particle and fiber-reinforced, as well as laminated composites; fracture, fatigue, and failure modes; damage theories and related special topics. *Prerequisites: AMES 231A-B-C or consent of instructor.*

## 233B. Micromechanics (4)

General theory of transformation strains and corresponding elastic fields; Green's functions and other solution methods; dislocations; inclusions and inhomogeneities; micromechanics of plastic flow and micromechanically based plasticity theories; microcracking, cavitation, and damage in crystalline and other solids, and the corresponding overall response and failure modes; selected topics. *Prerequisites: AMES 231A-B-C or consent of instructor.*

## 233C. Fracture Mechanics (4)

Theoretical strength; stress concentration. Linear fracture mechanics: stress singularity; fracture modes; stress field near a crack tip; energy method and energy release-rate; the J-integral. Nonlinear fracture mechanics: crack tip plastic zone; crack opening displacement; the Dugdale model; the R-curve, compliance method; the shape of plastic zone; power-law materials; the J-integral and the effective stress intensity factor: perfectly plastic solid; slip-line theory and stress field at crack tip; stability consideration. Fatigue; special topics. *Prerequisites: AMES 231A-B or consent of instructor.*

## 234. Experimental Mechanics (4)

Theory and technique of standard and newly developed methods; laboratory experience using modern instrumentation such as strain gauges, capacitive, piezoelectric and piezoresistive devices, and surface coatings, application of photoelasticity, laser interferometry, and holography to problems in static and dynamic elasticity and plasticity. Ultra-high-speed measurements will be emphasized. *Prerequisite: consent of instructor.*

## 235A-B. Theory of Shells (4-4)

General mathematical formulation of the theory of thin elastic shells; linear membrane and bending theories; finite strain and rotation theories; shells of revolution; shallow shells; selected static and dynamic problems; survey of recent advances. *Prerequisites: AMES 130A-B-C or consent of instructor.*

## 236. Structural Stability (4)

Stability analysis of structural elements under steady, oscillatory, and impulsive loadings. Elastic and anelastic stability problems. *Prerequisite: AMES 130A-B-C or consent of instructor.*

## 237. Structural Dynamics (4)

Matrix analysis of the free and forced vibrations of discrete linear systems; response to periodic and transient excitations. Frequency response and generalized normal mode methods. Dynamics of continuous systems. *Prerequisites: AMES 231A-B or consent of instructor.*

## 238. Stress Waves in Solids (4)

Linear wave propagation; plane waves; reflection and refraction; dispersion induced by geometry and by material properties. Application of integral transform methods. Selected topics in nonlinear elastic, anelastic, and anisotropic wave propagation. *Prerequisites: AMES 231A-B-C or consent of instructor.*

## 239. Earthquake Engineering (4)

Introduction to plate tectonics and basic concepts in seismology including rupture mechanism, measures of magnitude and intensity, descriptions of earthquake occurrence and its relation to geologic and tectonic processes. Measurements and description of strong earthquake ground motion; site effects on ground motion. Response of structures to earthquake excitation; soil-structure interaction effects; full-scale testing of structures; design criteria and code requirements. *Prerequisites: AMES*

*231A-B, AMES 237 (or concurrent enrollment) or consent of instructor.*

## 240. Advanced Reinforced and Prestressed Concrete Design (4)

Advanced topics in concrete design, including frame and shear wall structures, are discussed. Special emphasis is given to the design of connections and to confinement and ductility requirements under seismic loads. Complete reinforced and prestressed concrete systems are evaluated for seismic resistance. Upper and lower bound theories for slab design are derived. Analysis and design of circular prestressed concrete structures are discussed. *Prerequisite: AMES 135, AMES 136 or equivalent background in basic RC/PC design or consent of instructor.*

## 242. Bridge Design (4)

The course covers different aspects relevant to the design and the analysis of bridge structures. Construction methods and corresponding load conditions are investigated for various bridge types and geometries. Special problems in the analysis of box girder bridges, curved and skewed bridges and bridge structures under traffic loads, environmental, and seismic loads are discussed. Bearings and expansion joints are evaluated in connection with time and temperature dependent superstructure deformations. *Prerequisites: AMES 230 and fundamental courses in RC and PC design or consent of instructor.*

## 243. Masonry Structures (4)

Analysis and design of unreinforced and reinforced masonry structures, using advanced analytical techniques and design philosophies. Masonry material properties, stability, and buckling of unreinforced masonry. Flexural strength, shear strength, stiffness, and ductility of reinforced masonry elements. Design of masonry shear wall systems for seismic loads. *Prerequisites: AMES 135 or equivalent basic reinforced concrete course or consent of instructor.*

## 244. Offshore Structures (4)

Categories of offshore structures. Analysis under gravity, wave, and seismic loading. Soil/structure interaction. Structural details. Materials for offshore structures. Design problems. *Prerequisites: AMES 230, AMES 134 or equivalent course, AMES 136 or equivalent course or consent of instructor. Recommended: basic course in structural dynamics.*

## 251. Thermodynamics (4)

Principles of thermodynamics of single and multicomponent systems. Phase equilibria. Estimation, calculation, and correlation of properties of liquids and gases. *Prerequisite: consent of instructor.*

## 252. Chemical Reaction Engineering (4)

Analysis of chemical rate processes; complex kinetic systems. Chemical reactor properties in steady state and transient operations; optimal design policies. The interaction of chemical and physical transport processes in affecting reactor design and operating characteristics. Uniqueness/multiplicity and stability in reactor systems. Applications of heterogeneous reactor systems. *Prerequisite: consent of instructor.*

## 253. Heterogeneous Catalysis (4)

Physics and chemistry of heterogeneous catalysis; adsorption/desorption kinetics, chemical bonding, isotherms, kinetic models, selection of catalysts, poisoning, experimental techniques. *Prerequisite: consent of instructor.*

## 254. Biochemical Engineering Fundamentals (4)

Introduction to microbiology as relevant to the main topic, biological reactor analysis. Fermentation and enzyme technology. *Prerequisite: consent of instructor.*

## 256. Rheology of Fluids (4)

Continuum mechanics of fluids; definition of material functions for viscous and viscoelastic liquids; principles of rheological measurement; relationship to molecular structure. *Prerequisite: consent of instructor.*

**257A. Polymer Processing (4)**

Analysis of flow fields encountered in major methods of polymer fabrication: extrusion, coating, fiber spinning, injection molding, mixing. *Prerequisite: consent of instructor.*

**258. Special Topics in Chemical Engineering (4)**

Directed study of some area of specialization not covered in depth in the regular course offerings. *Prerequisite: consent of instructor.*

**259. Seminar in Chemical Engineering (1)**

Presentations on research progress by graduate students and by visitors from industrial and academic research laboratories. (May be repeated for credit; S/U grades only; course does not apply toward fulfillment of degree requirements.) *Prerequisite: consent of instructor.*

**271A. Cell and Molecular Biology (4)**

A general survey will include samples of structure-function relationships at the cell and tissue level. Emphasis will be placed on components of the vascular system and related structures such as endothelium, erythrocytes, leucocytes, cardiac, smooth and skeletal muscle, connective tissue, basement membranes, and peripheral nerve cells. *Prerequisites: Biology 151 and 153 or equivalent or consent of instructor.*

**271B. Cardiovascular Physiology (4)**

Physical concepts of behavior of heart, large blood vessels, vascular beds in major organs and the microcirculation. Included will be the physical and physiological principles of blood flow, blood pressure, cardiac work, electrophysiology of the heart, descriptions of special vascular beds, including their biological and hemodynamic importance. Integration of separate components through nervous and humoral controls will be analyzed. *Prerequisites: Biology 151 and 153 or equivalent or consent of instructor.*

**271C. Respiratory and Renal Physiology (4)**

Mechanics of breathing. Gas diffusion. Pulmonary blood flow. Stress distribution. Gas transport by blood. Kinetics of O<sub>2</sub> and CO<sub>2</sub> exchange. VA/Q relations. Control of ventilation. Glomerular and proximal tubule functions. Water metabolism. Control of Na and K in kidney. *Prerequisites: Biology 151 and 153 or equivalent or consent of instructor.*

**272. Biomechanics (4)**

An introduction to biomechanics and transport phenomena in biological systems at the graduate level. Biorheology, bio-viscoelastic fluids and solids, muscle mechanics, mass transfer, momentum transfer, energy transfer. The courses 272, 273, 278 form a core sequence in bioengineering. *Prerequisites: AMES 103B, 181, 182B or equivalent, or consent of instructor.*

**273. Biomedical Transport Phenomena (4)**

Nonequilibrium thermodynamic analysis of transport phenomena. The osmotic effect. Diffusion and exchange in biological systems. *Prerequisite: AMES 272 or consent of instructor.*

**274. Advanced Biomedical Transport Phenomena (4)**

Applications of heat, mass, and momentum transfer in biomedical systems. Extension of the principles encountered in AMES 272 and 273 to practical biomedical systems. *Prerequisites: AMES 272, 273, or consent of instructor.*

**275. Biomechanics of Cells (4)**

A survey of mechanical properties of cells and intracellular components. Elastic, viscous, and viscoelastic behavior of cell membranes, cytoplasm, pseudopods, and erythrocytes, leukocytes, endothelial cells, muscle. Experimental techniques and theoretical analysis. Applications to individual cell testing, filtration tests, and cell division. *Prerequisites: AMES 271A and 272 or consent of instructor.*

**276. Methodology for Single Cell Studies (4)**

Technology for the characterization and measurement of biophysical properties of single live cells. Imaging techniques.

Membrane mechanics. Mechanical and fluid mechanical manipulation. Electrodes and electrical methods. Flow and image cytometry. Automated cell recognition and sorting. *Prerequisite: consent of instructor.*

**277. Microcirculation in Health and Disease (4)**

Structural and functional aspects of transport and blood-tissue exchange in key organs during states such as circulatory shock, bacterial toxemia, hypertension. Also physical and ultrastructural techniques used to analyze small-vessel dynamics. *Prerequisite: consent of instructor.*

**278A. Advanced Biomechanics (4)**

Modern development of biomechanics at an advanced mathematical level. Selected topics in the dynamics of heart, pulsatile, blood flow, microcirculation, and muscle mechanics. *Prerequisite: AMES 272 or equivalent or consent of instructor.*

**278B. Biodynamics: Flow, Motion, and Stress (4)**

Stress distribution in organs. Body dynamics. Fluid movement. Flying and swimming. Growth and change. Strength and tolerance. Trauma and design for safety. *Prerequisite: AMES 272 or equivalent or consent of instructor.*

**279. Selected Topics in Biophysics (4)**

Selected topics in biophysics with emphasis on the structure and function of biological membrane, fluid and ion transport, excited states, wave propagation, muscle contraction, chemotaxis, chemical sensors, enzyme probes, swimming, and flying. *Prerequisites: AMES 272, 273, or consent of instructor.*

**281. Seminar in Bioengineering (1)**

The course involves weekly seminars given by faculty, visitors, postdoctoral research fellows, and graduate students concerning research topics in bioengineering and related subjects. Students report their own research. May be repeated for credit. This course does not apply toward the M.S. graduation requirements. (S/U grades only.)

**290A. Numerical Methods in Engineering Science (4)**

Numerical methods with computer exercises from various branches of engineering science. Interpolation. Integration. Solution of systems of linear and nonlinear equations. Fast Fourier transform. Solution of ordinary differential equations. Introduction to numerical partial differential equations. Convergence, stability, error estimation. *Prerequisite: AMES 154 or consent of instructor.*

**290B. Numerical Methods in Engineering Science (4)**

This course will discuss the numerical solution of differential equations that arise in various branches of applied mechanics and engineering. Topics include finite difference methods, spectral methods, finite element methods, boundary integral methods, particle methods, as well as specialized methods for problems with special considerations. *Prerequisite: AMES 290A.*

**291. Design and Mechanics in Computer Technology (4)**

Design and mechanics problems inherent in computer peripherals such as disk files, tape drives, and printers. Formulation and solution of problems involving mechanics, fluid mechanics, and materials; Reynolds equation, slider bearings; friction and wear; surface roughness; vibrations of rotating disks; introduction to actuator design, dimensional stability of substrate; instrumentation; experimental methods; impact printing; fluid jets; silicon micromechanics. *Prerequisite: consent of instructor.*

**292. Computer-Aided Design and Analysis (4)**

Introduction to 2-D and 3-D computer-aided design. Design problems may include: ball bearing kinematics, Weibull statistics, non-repeatable spindle run-out, design and analysis of four bar linkages, beam deflection and vibration, design of magnetic head suspension, hydrodynamic theory of lubrication,

design of air bearings, heat transfer in computer chips, optimization of optical servo, design of ink jet print head. *Prerequisite: consent of instructor.*

**293. Advanced Computer Graphics for Engineers and Scientists (4)**

Advanced topics used to enhance scientific and engineering visualization. C programming assignments and the use of advanced graphics software. Continuation of topics from AMES 157, including color, computational geometry, 3-D contouring, volume visualization, and hardware architectures. *Prerequisite: AMES 157 or consent of instructor.*

**294A-B-C. Methods in Applied Mechanics, I, II, III (4-4-4)**

Various methods of analysis are covered with emphasis on application. Topics range over the broad fields of complex analysis, ordinary and partial differential equations (linear and nonlinear), asymptotic analysis, integral equations and weighted residuals. Specifics include Dirichlet and Neumann problems. Cauchy concepts. Green functions, Riemann mapping, eigenfunctions, phase-plane analysis, steepest descents, multiple scales. WKB method, matched asymptotic expansions, transform techniques, Fredholm theory. Wiener-Hopf method. Galerkin method. *Prerequisites: Math. 110, Math. 120A or consent of instructor.*

**296. Independent Study (4)**

*Prerequisite: consent of instructor.*

**298. Directed Group Study (1-4)**

Directed group study on a topic or in a field not included in regular department curriculum, by special arrangement with a faculty member. *Prerequisite: consent of instructor. (S/U grades permitted.)*

**299. Graduate Research (1-12)**

(S/U grades only.)

**COMPUTER SCIENCE AND ENGINEERING (CSE)**

**OFFICES:**

Undergraduate Affairs 4016  
Graduate Affairs 4018  
Applied Physics and Mathematics Building, Muir College

**Professors**

Kenneth L. Bowles, Ph.D., *Professor Emeritus*  
Walter A. Burkhard, Ph.D.  
Flaviu Cristian, Ph.D.  
William E. Howden, Ph.D.  
T. C. Hu, Ph.D.  
Christos Papadimitriou, Ph.D., *Jacobs Professor of Computer and Information Science*  
Michael Saks, Ph.D.  
Walter J. Savitch, Ph.D.  
S. Gill Williamson, Ph.D., *Chair*

**Associate Professors**

Francine D. Berman, Ph.D.  
Patrick Dymond, Ph.D.  
Victor Vianu, Ph.D.

**Assistant Professors**

Scott B. Baden, Ph.D.  
 Richard K. Belew, Ph.D.  
 Laurette Bradley, Ph.D.  
 Chung-Kuan Cheng, Ph.D.  
 Garrison Cottrell, Ph.D.  
 Charles P. Elkan, Ph.D.  
 William G. Griswold, Ph.D.  
 Russell Impagliazzo, Ph.D.  
 Paul Kube, Ph.D.  
 Alex Orailoglu, Ph.D.  
 Joseph Pasquale, Ph.D.  
 Ramamohan Paturi, Ph.D.  
 George Polyzos, Ph.D.  
 Venkat Rangan, Ph.D.  
 Augustus K. Uht, Ph.D., P.E.  
 S. Heather Woll, Ph.D.

**Adjunct Faculty**

Samuel R. Buss, Ph.D.  
 Sidney Karin, Ph.D.  
 Walter H. Ku, Ph.D.  
 Terrence J. Sejnowski, Ph.D.

**THE MAJOR PROGRAMS FOR UNDERGRADUATES**

The department offers four-year programs in computer science and computer engineering. These programs, which lead to the B.S. degree, prepare students for employment in computer industries and for graduate work in these fields. In addition, the department offers a program leading to the B.A. degree in computer science. This is intended for students desiring more time for undergraduate studies outside their major subject. It prepares students for graduate study in their respective fields as well as for immediate employment.

To graduate in four years with a B.S. in computer science or computer engineering, a student without advanced standing should enroll for approximately eighteen units for three quarters and sixteen units during other quarters (or attend some summer quarters). In addition, each student must satisfy general-education course requirements determined by the student's college, as well as major requirements determined by the department. The five colleges at UCSD require widely different numbers of general-education courses. Each student should choose his or her college carefully, considering the special nature of the college and breadth of education, realizing that some colleges require considerably more courses than others.

To graduate, a grade-point average of 2.0 will be required in upper-division courses in the major, including technical electives. Approved technical electives for each major are listed in this

section under each respective major. If a student wants to deviate from the list, the course must be petitioned through the department. The limit on the number of technical electives that can be substituted is as follows:

B.S. Computer Science—maximum of three courses outside of list.

B.S. Computer Engineering—maximum of two courses from outside of CSE or ECE departments.

B.A. Computer Science—maximum of two courses outside of list.

A total of at most four units of either CSE 197, 198, or 199 may be applied in fulfilling the requirements for a major program in the Department of Computer Science and Engineering. These must be taken on a Pass/No Pass basis.

Students enrolled in the departmental programs who maintain a distinguished scholastic record through their junior year are encouraged to apply for the five-year B.S.-B.A./M.S. program. Applications for admission to the graduate program may be made in the spring quarter of the junior year. In their senior year such students may enroll in graduate courses and can complete the requirements for the master's degree within one year after receiving the bachelor's degree. If the student's eventual aim is to take a Ph.D., he or she will be able to begin research earlier and spend a shorter time in completing the degree. The student's choice of electives must be discussed with his or her adviser.

**ADMISSIONS**

Admission to CSE majors is based on performance in required lower-division courses. See section on "Admission to majors in the Division of Engineering" in this catalog.

After six quarters of study at UCSD (or three quarters for transfers), a student's admission to the CSE department will be decided. Pre-CSE students denied admission to a CSE major will automatically have their major converted from "Pre-CSE" to "Undeclared" by the department at the time of their denial.

In addition, pre-CSE students will not be allowed to continue to enroll in upper-division CSE courses beyond the fall quarter of their junior year. Only students who are admitted to a CSE major will be allowed to continue to enroll in upper-division CSE courses.

However, CSE minors and students in related majors who are required to take CSE courses will be allowed to enroll in upper-division CSE courses as long as they have completed the required prerequisites or equivalents.

**THE B.S. CURRICULA**

**COMPUTER SCIENCE**

The computer science program offers a strong emphasis on engineering mathematics, basic engineering science, and software. Students should have sufficient background in high school mathematics so that they can take freshman calculus in their first quarter. Courses in high school physics and computer programming, although helpful, are not required for admission to the program.

The required lower-division courses are:

1. Math. 2A/2AH, 2B/2BH, 2C/2CH, 2DA/2DH, 2EA/2EH, and 2F/2FH.
2. Phys. 2A-B-C-D. Math. 2A is prerequisite for Phys. 2A. Students whose performance on the Department of Mathematics placement test permits them to start with Math. 2B or a higher course may take Phys. 2A in the fall quarter of the freshman year; all others will take Phys. 2A in the winter quarter of the freshman year. Students who received high grades in both calculus and physics in high school may substitute the majors' sequence (Phys. 4A-B-C-D) for Phys. 2A-2B-2C-2D.
3. Phys. 2BL and Phys. 2CL or 2DL (limited enrollment). These should be taken concurrently with the Phys. 2 or Phys. 4 sequences.
4. CSE 65 or 62B, 64, and 70.
5. ECE 50A-B-C and ECE 52AL-BL-CL.
6. Chem. 6A-6B or Chem. 7A-7B. A lower-division course in biology may be substituted for Chem. 6B or Chem. 7B.

The required upper-division courses are Math. 183 and:

**Junior Year**

- (a) CSE 160A-B
- (b) CSE 161A-B
- (c) CSE 163A-B
- (d) CSE 170A-B
- (e) CSE 165, 173
- (f) Technical elective (eight units)

**Senior Year**

- (a) CSE 171A-B
- (b) CSE 175B-C
- (c) CSE 179
- (d) Technical elective (sixteen units)

**Electives**

- ECE 105A/B/C  
 ECE 131A/B/C  
 ECE 132  
 ECE 136A/B  
 ECE 140A/B/C  
 ECE 141A/B/C  
 ECE 146A/B/C

ECE 152A/B/C  
 ECE 154A/B/C  
 ECE 159A/B/C  
 CSE 162  
 CSE 166  
 CSE 170C  
 CSE 171C  
 CSE 172A/B  
 CSE 174  
 CSE 176  
 CSE 177  
 CSE 178A/B  
 CSE 180  
 CSE 181  
 CSE 197  
 CSE 198  
 CSE 199  
 AMES 141A/B/C  
 Math. 102  
 Math. 160A/B  
 Math. 170A/B/C  
 Math. 171A/B  
 Math. 172  
 Math. 173  
 Math. 180A/B/C  
 Math. 181A/B

**COMPUTER ENGINEERING**

Students wishing to take the computer engineering curriculum must be admitted to either the CSE or ECE department. The set of required courses and allowed electives is the same in both departments.

The computer engineering program offers a strong emphasis on engineering mathematics and other basic engineering science as well as a firm grounding in computer science. Students should have sufficient background in high school mathematics so that they can take freshman calculus in their first quarter. Courses in high-school physics and computer programming, although helpful, are not required for admission to the program.

The required lower-division courses are:

1. Math. 2A/2AH, 2B/2BH, 2C/2CH, 2DA/2DH, 2EA/2EH, and 2F/2FH.
2. Phys. 2A-2B-2C-2D. Math. 2A is prerequisite for Phys. 2A. Students whose performance on the Department of Mathematics placement test permits them to start with Math. 2B or a higher course may take Phys. 2A in the fall quarter of the freshman year; all others will take Phys. 2A in the winter quarter of the freshman year. Students who received high grades in both calculus and physics in high school may substitute the majors' sequence (Phys. 4A-B-C-D) for Phys. 2A-B-C-D.

3. Phys. 2BL and Phys. 2CL or 2DL (limited enrollment). These should be taken concurrently with the Phys. 2 or Phys. 4 sequences.
4. CSE 65 or 62B, 64, and 70.
5. ECE 50A-B-C and ECE 52AL-BL-CL.
6. Chem. 6A-6B or Chem. 7A-7B. A lower-division course in biology may be substituted for Chem. 6B or Chem. 7B.

The required upper-division courses are:

**Junior Year**

- (a) ECE 105A
- (b) ECE 152A-B
- (c) CSE 160A-B
- (d) CSE 170A-B
- (e) CSE 175B-C
- (f) ECE 132
- (g) Technical elective (four units)

**Senior Year**

- (a) ECE 146B
- (b) ECE 147A
- (c) CSE 161A-B
- (d) CSE 163A
- (e) CSE 171A-B
- (f) CSE 180
- (g) Technical elective (eight units)

**Electives**

Any upper-division CSE or ECE course not already listed as a core course is acceptable as a technical elective with the exception of ECE 138.

**THE B.A. CURRICULUM**

**COMPUTER SCIENCE**

The required lower-division courses are:

1. Math. 2A/2AH, 2B/2BH, 2C/2CH, 2DA/2DH, and 2EA/2EH.
2. Phys. 2A-B-C. Math. 2A is prerequisite for Phys. 2A. Students whose performance on the Department of Mathematics placement test permits them to start with Math. 2B or a higher course may take Phys. 2A in the fall quarter of the freshman year; all others will take Phys. 2A in the winter quarter of the freshman year. Students who received high grades in both calculus and physics in high school may substitute the majors' sequence (Phys. 4A-B-C) for Phys. 2A-B-C.
3. CSE 65 or 62B, CSE 70

The required upper-division courses are:

**Junior Year**

- (a) CSE 160A-B
- (b) CSE 161A-B
- (c) CSE 163A-B
- (d) CSE 170A
- (e) CSE 175B

**Senior Year**

- (a) CSE 165
- (b) CSE 171A
- (c) CSE 179
- (d) Technical elective (sixteen units)

**Electives**

CSE 162  
 CSE 166  
 CSE 170B/C  
 CSE 171B/C  
 CSE 172A/B  
 CSE 173  
 CSE 174  
 CSE 175C  
 CSE 176  
 CSE 177  
 CSE 178A/B  
 CSE 180  
 CSE 181  
 CSE 197, 198 or 199  
 ECE 132  
 ECE 146A/B/C  
 ECE 159A/B/C  
 Econ. 172A/B/C  
 Math. 160A/B/C  
 Math. 170A/B/C  
 Math. 172  
 Math. 173

**MINOR CURRICULA**

CSE offers four minors (listed below). Admission is based on a student's performance in CSE 62B or 65, 70, and four courses in the Math. 2 sequence. The prerequisites for these minor curricula require certain other courses which must therefore be anticipated in the student's program. Revelle students should consult their provost's office concerning their noncontiguous minor.

Not all minor curricula are available to a student pursuing a CSE major curriculum. See the departmental office for a list of permissible minors.

Programs of concentration for Warren College should be selected from this list. Rules concerning overlap with the major curriculum are available from the Office of the Provost, Warren College.

**Artificial Intelligence**

CSE 65 or 62B, 70, 161A, 162, 178A-B

**Computer Hardware**

CSE 65 or 62B, 70, 170A-B, 175B-C

**Computer Software**

CSE 65 or 62B, 70, 161A, 163A-B, 173 (or 171A)

**Computer Theory (seven courses required)**

CSE 65 or 62B, 70, 160A, 161A-B, 165, and 179



## COMPUTING FOR STUDENTS IN THE HUMANITIES AND SOCIAL SCIENCES

An introduction to the structure and use of automatic digital computers is provided in CSE 62A and 62B (Introduction to Programming I and II) and CSE 60 (The Language of the Computer).

## ADMISSION TO UPPER-DIVISION COURSES

The Department of Computer Science and Engineering will attempt to provide sufficient sections of all lower-division courses so that students who meet the prerequisites for a given course will be able to enroll. Students will, however, be screened to ensure that they meet all course prerequisites for these lower-division courses.

Admission to upper-division courses will be restricted to students having completed all prerequisites with a C — or better (or consent of the instructor). The majority of CSE courses have enrollment restrictions which give priority in the following order: students admitted by the department to a major or minor curriculum; students fulfilling a requirement for another major; all others. Within these categories, priority is determined on the basis of graduation date and/or credits completed. Where these restrictions apply, the registrar will not enroll nonmajors except by department approval. Students who are undeclared will not be admitted to upper-division CSE courses.

Those students not in compliance with the above restrictions should be forewarned that they will automatically be dropped from course rosters (at any time during the quarter) when it comes to the attention of the department that a student is enrolled in a course without being eligible because the prerequisites and/or performance standards have not been met. Admission to all CSE courses will require obtaining either course authorization through telephone registration or department stamps on a registration form, and it will be given only by the student affairs staff.

All students enrolled at UCSD and wishing to enter a departmental major or minor curriculum must submit an application in accordance with the policy set forth by the Division of Engineering (above) by the end of the second week of the spring quarter of the preceding year. Applications may be obtained from the Undergraduate Affairs Office in Room 4016, Applied Physics and Mathematics Building. Incoming transfer students must submit their application within three quarters of study at UCSD. Transfer students who wish to

enter directly one of our major curricula must show evidence that they have completed equivalent prerequisite courses.

Due to large student interest in CSE, admission into the department is limited to only the most qualified students.

The department will set an overall quota for admission to the major and minor curricula for each academic year. It will be based upon:

1. Preregistration of students who have already completed upper-division CSE courses;
2. Preregistration of students required to enroll in upper-division courses for major curricula offered by other departments;
3. Estimates of the number of incoming transfer students who will be admitted to the major curricula; and
4. Class limits for upper-division courses.

## TRANSFER STUDENTS

Requirements for admission to upper-division courses and to the major curricula are the same for transfer students as for continuing students. When planning their program, students should be mindful of lower-division prerequisites necessary for admission to upper-division courses. Transfer students should be prepared either to petition equivalent courses with the appropriate departments and/or present a copy of their records prior to making application to a CSE major.

Students who wish to enter a major curriculum directly must make application to the department before the beginning of the fall quarter, submitting course descriptions and transcripts for courses used to satisfy their lower-division requirements. Although admission is not normally restricted to the fall quarter, transfer students entering in the winter or spring quarter should be aware that scheduling difficulties may occur because upper-division sequences normally begin in the fall quarter.

## THE GRADUATE PROGRAM

The graduate program offers master of science and doctor of philosophy degrees in computer science and computer engineering. To be accepted into either course of study, a student must have a B.A./B.S. degree in computer science, computer engineering, or a related area.

The graduate program is concerned with fundamental aspects of computation; emphasis is divided among the areas of theory, hardware, software systems, and artificial intelligence. The computer engineering specialization places a greater emphasis on hardware and the design of computer systems.

Admission to the graduate program is done through the Office of Graduate Admissions, Department of CSE. Deadline for application is January 15. Admissions are always effective the following fall quarter.

## FIVE-YEAR BACHELOR'S-MASTER'S PROGRAM

Students interested in the combined bachelor's-master's degree may start taking graduate classes in the senior year, with permission from the student's adviser. Graduate classes the student takes in the senior year cannot be counted towards the bachelor's degree as well as the M.S. degree. Students must apply for graduate study by regular application and meet the regular criteria for admission. Graduate Record Examination scores are required.

## COMPUTER SCIENCE PROGRAM

### MASTER OF SCIENCE PROGRAM

The department offers the master of science degree in computer science. The degree is offered under both the Thesis Plan I and the Comprehensive Examination Plan II. For full-time students, all the requirements must be completed within two years. Students with an adequate background in computer science can complete the M.S. program within four to five quarters of full-time study.

### Plan I: Thesis Option, No Comprehensive Exam

This plan of study involves both course work and research, culminating in the preparation of a thesis. A total of forty-eight units of credit is required, as follows:

#### Core Courses

The following six core courses must be completed with an average grade of B, and no grade below B — :

- CSE 264B
- CSE 264C or CSE 273
- CSE 265B or CSE 261
- CSE 270A
- CSE 279
- One unit of Faculty Seminar

#### Electives

Four or more technical electives consisting of other CSE graduate courses or approved alternatives for a total of sixteen units. The units obtained in the courses CSE 269, 280, 298, 299,



and 501 do not count toward the sixteen units required.

**Thesis**

Twelve units of CSE 298 must be taken to fulfill the research requirement.

A thesis based on the research must be written and subsequently reviewed by the committee, which is set up at the beginning of the first quarter of CSE 298, consisting of three faculty members, with at least two members from within the CSE department. The committee is appointed by the dean of Graduate Studies.

**Plan II: Comprehensive Examination, No Thesis**

In order to receive the M.S. degree in computer science under this plan, a student must complete the course requirements listed below and pass a written comprehensive examination. The comprehensive examination is designed to test the student's knowledge in basic computer science material. The examination can normally be passed with a thorough knowledge of topics covered in the undergraduate and the first-year graduate computer science programs. In particular, the written examination is structured around the following five CSE core areas: algorithms, computability, complexity and logic, programming languages, operating systems, computer architecture, and digital logic design.

**Core Courses**

The following six core courses must be completed with an average grade of B, and no grade below B-:

- CSE 264B
- CSE 264C or CSE 273
- CSE 265B or CSE 261
- CSE 270A
- CSE 279
- One unit of Faculty Seminar

**Electives**

Six or more technical electives consisting of other CSE graduate courses or approved alternatives for a total of twenty-four units are required. The units obtained in courses CSE 269, 280, 298, 299, and 501 do not count towards the twenty-four units required.

**Project**

Four units of CSE 269.

**Comprehensive Examination**

The student must secure at least a master's-level pass in the written comprehensive examina-

tion. Procedures governing the comprehensive examination can be found in a separate document provided by CSE in the graduate office.

**DOCTORAL PROGRAM**

The general requirements for the Ph.D. program are stated in the "Graduate Studies" section of the catalog. A brief summary of the general requirements is also provided in the section titled "All Doctoral Programs." In harmony with these requirements, the department has established a set of requirements to be fulfilled in the first two to three years of the Ph.D. program as described below.

**Course Requirements**

Ph.D. students are expected to complete the course requirements in the first two years of the program. They are expected to maintain, on an annual basis, a 3.4 grade-point average for the core courses.

Ph.D. students entering with a master's degree may petition for a waiver of the core courses or for substitution by alternative courses.

**Core Courses**

Each Ph.D. student must take all of the following courses. A student typically completes all the core courses within the first year of the graduate study.

- CSE 264B
- CSE 265B
- CSE 270A
- CSE 273
- CSE 279
- One unit of Faculty Seminar

**Electives**

Each Ph.D. student must take the following: three technical electives consisting of other CSE graduate courses or approved alternatives.

**Comprehensive Examination Requirement**

The comprehensive examination for Ph.D. students consists of two parts. The first part is a written examination, identical to that required for master's degree students. This examination tests the student's knowledge of basic computer science and can be passed with a thorough knowledge of undergraduate and first-year graduate computer science material. In particular, the written examination is structured around the following five CSE core areas: algorithms, computability, complexity and logic, programming languages, operating systems, computer architecture, and digital logic design. It is offered ev-

ery year at the start of the fall term. If seven or more students sign up for the written comprehensive examination, the department would offer it again at the start of the spring term. All Ph.D. students should complete their written comprehensive examination successfully within two years following the quarter in which they are admitted to the Ph.D. program. Each student is allowed three attempts to pass the examination. A student typically completes the written part of the comprehensive examination successfully by the fall quarter of the second year.

The second part of the comprehensive examination for Ph.D. students is an oral research examination designed to get an early assessment of the Ph.D. student's research ability in some field in computer science. Students are expected to take this examination within one year following the quarter in which they pass the written comprehensive examination.

More information regarding the comprehensive examination can be found in a separate document provided by the CSE graduate office.

**COMPUTER ENGINEERING PROGRAM**

Computer engineering, jointly administered between the CSE and ECE departments, offers the master of science and doctoral degrees. Computer engineering explores the engineering analysis and design aspects of algorithms and technology. Specific research areas include computer systems, signal processing systems, architecture, networks, computer-aided design, fault tolerance, and data storage systems.

**MASTER OF SCIENCE PROGRAM**

The master of science degree entails forty-eight units of work; students may elect the thesis option Plan I or comprehensive examination option Plan II. For full-time students, all the requirements must be completed within two years. Prepared students can complete the program in one year of full-time study.

Upon completing the requirements for the master of science degree, a student may apply for admission to the Ph.D. program. The student's current file will be considered by the admissions committee.

**Plan I: Thesis Option, No Comprehensive Exam**

This plan of study involves both course work and research, culminating in the preparation of a thesis. A total of forty-eight units of credit is required, as follows:

**Core Courses**

The following core courses must be completed with an average grade of B, and no grade below B—:

*Three Software Courses:*

- CSE 264B
- CSE 268A or CSE 279
- CSE 264C

*Three Hardware Courses:*

- CSE 270A
- ECE 230A
- CSE 281V or ECE 251A or ECE 263A

*Two Analysis Courses:*

- CSE 265B or CSE 261
- CSE 281L or ECE 257A

and:

One unit of Faculty Seminar

**Electives**

Students must elect at least four technical units among graduate courses within the Departments of AMES, CSE, ECE, Mathematics, and Physics.

**Thesis**

Twelve units of CSE 298 must be taken to fulfill the research requirement.

A thesis based on research must be written and subsequently reviewed by the committee, which is set up at the beginning of the first quarter of CSE 298, consisting of three faculty members, with at least two members from within the CSE department. The committee is appointed by the dean of Graduate Studies.

**Plan II: Comprehensive Examination, No Thesis**

In order to receive the M.S. degree in computer science under this plan, a student must complete the course requirements listed below and pass a written comprehensive examination. The comprehensive examination is designed to test the student's knowledge in basic computer science and engineering material. The examination can normally be passed with a thorough knowledge of topics covered in the undergraduate and the first-year graduate computer science or computer engineering programs. In particular, the written examination is structured around the following five CSE core areas: algorithms, computability, complexity and logic, programming languages, operating systems, computer architecture, and digital logic design. This examination is the same for both the computer science

and the computer engineering graduate programs. More information about the comprehensive examination can be obtained in a separate document from the CSE graduate office.

**Core Courses**

*Three Software Courses:*

- CSE 264B
- CSE 268A or CSE 279
- CSE 264C

*Three Hardware Courses:*

- CSE 270A
- ECE 230A
- CSE 281V or ECE 251A or ECE 263A

*Two Analysis Courses:*

- CSE 265B or CSE 261
- CSE 281L or ECE 257A

and

One unit of Faculty Seminar

**Electives**

Students must elect at least twelve technical units among graduate courses within the Departments of AMES, CSE, ECE, Mathematics, and Physics.

**Thesis**

Four units of CSE 269.

**Comprehensive Examination**

Must secure at least a master's-level pass in the written comprehensive examination.

**DOCTORAL PROGRAM**

The general requirements for the Ph.D. program are stated in the "Graduate Studies" section of the catalog. A brief summary of the general requirements is also provided in the section titled "All Doctoral Programs." In harmony with these requirements, the department has established a set of requirements to be fulfilled in the first two to three years of the Ph.D. program as described below.

**Course Requirements**

Students are expected to complete the following computer engineering curriculum of forty-eight unit course requirement within the first two years. Students entering with a master of science degree may petition to waive individual core course requirements or to substitute approved alternative courses. All Ph.D. students must attain a cumulative grade-point average of 3.4 in the core courses.

A student must obtain a research adviser from the CSE or ECE faculty, and as soon as fulfillment of the course requirements is well under way, the student should begin a research project.

**Core Courses**

Each Ph.D. student must complete the following core requirements:

*Three Software Courses:*

- CSE 264B
- CSE 268A or CSE 279
- CSE 264C

*Three Hardware Courses:*

- CSE 270A
- ECE 230A
- CSE 281V or ECE 251A or ECE 263A

*Two Analysis Courses:*

- CSE 265B or CSE 261
- CSE 281L or ECE 257A

and

One unit of Faculty Seminar

**Electives**

Students must elect at least sixteen technical units among graduate courses within the Departments of AMES, CSE, ECE, Mathematics, and Physics.

**Comprehensive Examination Requirement**

The comprehensive examination for Ph.D. students consists of two parts. The first part is a written examination, identical to that required for master's degree students. This examination tests the student's knowledge of basic computer science and engineering and can be passed with a thorough knowledge of undergraduate and first-year graduate computer science and engineering material. In particular, the written examination is structured around the following five CSE core areas: algorithms, computability, complexity and logic, programming languages, operating systems, computer architecture, and digital logic design. This examination is the same for both the computer science and the computer engineering graduate programs.

It is offered every year at the start of the fall term. If seven or more students sign up for the written comprehensive examination, the department would offer it again at the start of the spring term. All Ph.D. students should complete their written comprehensive examination successfully within two years following the quarter in which they are admitted to the Ph.D. program. Each student is allowed three attempts to pass

## Courses

the examination. A student typically completes the written part of the comprehensive examination successfully by the fall quarter of the second year.

The second part of the comprehensive examination for Ph.D. students is an oral research examination designed to get an early assessment of the Ph.D. student's research ability in some field in computer science. Students are expected to take this examination within one year following the quarter in which they pass the written comprehensive examination.

More information regarding the comprehensive examination can be found in a separate document provided by the CSE graduate office.

## ALL DOCTORAL PROGRAMS

### QUALIFYING EXAMINATION AND ADVANCEMENT TO CANDIDACY

The qualifying examination is the second examination (the first being the written and the oral comprehensive examination) taken by the Ph.D. students and is a requirement to advancement to candidacy. Prior to taking the qualifying examination a student must have satisfied the departmental graduate requirements and have been accepted by a CSE faculty member as a Ph.D. thesis candidate. All doctoral students must be advanced to candidacy by the end of four years from the first quarter of registration. It is administered by a doctoral committee appointed by the dean of Graduate Studies and Research and consists of faculty from CSE and other departments. More information on the composition of the committee can be obtained from the CSE graduate office. The examination is taken after the student and his or her adviser have identified a topic for the dissertation and initial progress has been made. The candidate is expected to describe his or her accomplishments to date and plans for future work.

### DISSERTATION

The dissertation defense is the final Ph.D. examination. A candidate for the Ph.D. is expected to write a dissertation and defend it in an oral examination conducted by the doctoral committee.

### DEPARTMENTAL PH.D. TIME LIMIT POLICIES

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed seven years. Total registered time at UCSD cannot exceed eight years.

The department will endeavor to offer the courses as outlined below; however, unforeseen circumstances sometimes mandate a change of scheduled offerings. Students are strongly advised to check the *Schedule of Classes* or the department before relying on the schedule below.

The names appearing below the course descriptions are those of faculty members in charge of the courses. For the names of the instructors who will teach the courses in a particular term, please refer to the quarterly *Schedule of Classes*. CSE 65 and CSE 62B are interchangeable as prerequisites for other courses.

## LOWER DIVISION

### 60. The Language of the Computer (4)

(Same as Ling. 63.) This course will focus on differences between human and computer languages. Topics also include an overview of UNIX and the roles played by hardware and software. Students will learn to use editors, word-processing programs, utilities, and to write CSH scripts. This course has no prerequisite.

### 62A. Introduction to Programming I (4)

Teaches basic skills for using UNIX utilities to maintain files. Topics include the notion of files and directories, use of editors, electronic mail, and changing the user's environment by means of aliases and simple shell scripts. Introduction to algorithms and a top-down program design. Introduction to the PASCAL language. A student may not receive credit for CSE 62A after receiving credit for CSE 65.

### 62B. Introduction to Programming II (4)

Hierarchical program structures, top-down and bottom-up testing techniques, use of assertions, introduction to data structures, simple analysis of round off error in real arithmetic. Completion of the PASCAL programming language, including records, files, and pointers. (A student may not receive credit for both CSE 65 and CSE 62B.) *Prerequisites: Math. 1A and CSE 62A.*

### 64. Scientific Application of Computers (4)

Introduction to elementary numerical analysis, with emphasis on computer applications. Systems of linear equations, interpolation, extrapolation, polynomial fits to data, root finding, numerical differentiation and integration. Three hours' lecture, two hours' recitation. The recitation sections will be divided into two sets, those which use FORTRAN as the course programming language and those which use PASCAL. *Prerequisite: Math. 2B and CSE 62B or 65 or equivalent course emphasizing structured programming approved by the instructor.*

### 65. Introduction to Programming Techniques (4)

Basic design methods for effective programming, including the notion of an algorithm, hierarchical program structures, top-down and bottom-up testing techniques, use of assertions, introduction to data structures, simple analysis of round-off error in real arithmetics. The PASCAL programming language, including records, files, and pointers. (A student may not receive credit for both CSE 65 and CSE 62B.) *Prerequisite: Math. 2A (may be taken concurrently).*

### 69. Computers and Society (4)

An introduction to computers, their applications, and their impact on people and social institutions. Factual and technical information for making objective judgments about computer use. Social problems created by the use of computers and tools for solving them. Constructive and creative thought about technol-

ogy and its social impact. Three hours' lecture. This course has no prerequisite; it is based on the hypothesis that the computer affects all of us and is important for everyone to understand.

### 70. Introduction to Systems Programming (4)

Introduction to the fundamental physical and mathematical structures of computer software engineering. Topics include machine structure and assembly language programming, program control structure, program data structure, and analysis of program correctness and performance. Three hours' lecture. *Prerequisite: CSE 62B or 65, or consent of instructor.*

### 75. Principles of Programming (4)

Design methods for programming and problem solving, including recursion and abstract data types. The C programming language, including structures, pointers, type definitions, and the preprocessor. The UNIX programming environment and tools, including streams, C standard libraries, project maintenance facility, and symbolic debugger. Three hours' lecture, one hour recitation, and six hours' laboratory per week. A student may not receive credit for CSE 75 after receiving credit for CSE 161A. *Prerequisites: CSE 62B/65; Math. 2C.*

### 77. Introduction to Object-Oriented Programming (4)

Object-oriented problem solving, encapsulation, inheritance, and polymorphism. The C++ programming language, including declarative and imperative statements, functions, classes, method access control, references, virtual functions, operator overloading, input-output streams, constructors and destructors, and conversions. Standard C++ libraries, UNIX programming environment. *Prerequisite: CSE 75 or consent of instructor.*

## UPPER DIVISION

### 160A. Discrete Mathematics (4)

Introduction to discrete structures and mathematical reasoning which will be useful in designing and analyzing algorithms. Topics include mathematical logic and methods of proof, natural numbers and mathematical induction, program verification; sets and operations on sets, basics of probability, inductive definition of sets, finite and infinite sets; relations and functions, equivalence relations and partitions, order relations; and basic abstract algebra. Three hours' lecture.

### 160B. Combinatorics and Graph Theory (4)

Introduction to combinatorial reasoning and graph theory. Topics include basic counting principles, permutations and combinations, binomial coefficients, more on probability; recurrence relations; generating functions; inclusion-exclusion principle; analysis of algorithms; introduction to graph theory with a selection of topics from trees; paths, connectivity, planarity, coloring, and matching. Three hours' lecture. *Prerequisite: CSE 160A.*

### 161A. Data Structures I (4)

Principles of data types and structures, abstract data types. Lists, arrays, tables, priority queues, and static dictionaries. Run-time analysis. Linked lists, hashing, and tree structures. *Prerequisites: CSE 62B or 65, 70.*

### 161B. Data Structures II (4)

Static and dynamic structures, files, secondary storage models, searching. *Prerequisites: CSE 160A and 161A or equivalent.*

### 162. Programming Languages for Artificial Intelligence (4)

Experience using LISP, PROLOG, and an object-based language to solve typical problems from artificial intelligence (AI). Relative advantages and disadvantages of these languages and considerations for selecting a language for a particular problem will be discussed. *Prerequisite: CSE 161A.*

### 163A-B. Compiler Construction (4-4)

Principles and practice of constructing translators for programming languages, compiling, lexical analysis, syntactic analysis,

context-free grammars, symbol tables, syntax-directed translation, optimization, automatic generation of lexical and syntactic analyzers. *Prerequisites: CSE 70 and CSE 161A.*

**165. Algorithms, Automata, and Formal Languages (4)**  
Automata theory: finite state machines, pushdown automata, Turing machines, computability. Formal language theory. Three hours' lecture. *Prerequisites: CSE 163A and CSE 160A.* (A student may not receive credit for both CSE 165 and Math. 166.)

**166. Computer Networks (4)**  
Introduction to concepts, principles, and practice of computer communication networks, with examples from existing architectures, protocols, and standards. Layering and the OSI model; switching; local, metropolitan, and wide area networks; datagrams and virtual circuits; routing and congestion control; internetworking. *Prerequisites: CSE 160A-B and 170A.*

**170A. Introduction to Digital Logic (4)**  
Data representation and coding. Combinational and sequential logic design: Boolean algebra, switching functions, gates, bilateral switches, adders, state machines, flip-flops, timing, Mealy and Moore machines, analysis and synthesis of canonical forms, intermediate logic building blocks, nontraditional approaches to logic design. *Prerequisite: CSE 70 or consent of instructor.*

**170B. Introduction to Computer Architecture (4)**  
Register-transfer language approach to sequential machine design. CPU organization. Instruction sets. Microprogrammed vs. hardwired control units. Busses. Memory elements and organization; the memory hierarchy. Input/output, interrupts. Computer arithmetic. Microprocessors. Three hours' lecture. *Prerequisite: CSE 170A or consent of instructor.*

**170C. Digital System Concepts and Design (4)**  
Structured machine design, algorithmic state machines, microcoding, mixed-mode logic, error detection and correction, testability, gate arrays, standard cells, PLAs, memory design, packaging issues, asynchronous circuits, timing issues. A complex digital system (such as that architected in CSE 170B) will be designed and built. *Prerequisites: CSE 170A-B and 175B. CSE 175C recommended (may be taken concurrently).*

**171A-B. Principles of Computer Operating Systems (4-4)**  
Batch systems, multiprogramming, procedure implementation, processes, parallelism, critical sections, deadlocks, communication, multiprocessing, multilevel memory management, binding, name management, file systems, protection, resource allocation, scheduling. Three hours' lecture. *Prerequisites: CSE 161A and 170A.*

**171C. Systems Programming Laboratory (4)**  
Laboratory focusing on systems programming. Experience with concurrent programming, synchronization mechanisms (e.g., semaphores and monitors), and interprocess communication using message-passing vs. shared memory. Experience with operating systems implementation: process scheduling; I/O buffering; paging and swapping techniques; device drivers and interrupt handlers. *Prerequisite: CSE 171A.*

**172A-B. VLSI Systems Design (4-4)**  
System architecture, logic design, symbolic layout, timing, VLSI testing, CAD technologies, silicon compilation, and intelligent VLSI design tools. Produce, design, simulation, layout, and testing of sample microprocessor using advanced VLSI design workstations. *Prerequisites: CSE 170A-B.*

**173. Comparative Study of Programming Languages (4)**  
Introduction to several high-level programming languages. Comparison of language features and analysis of language design. Courses will involve programming with each language studied (e.g., APL, LISP, and SNOBOL). Three hours' lecture. *Prerequisites: 62B or 65, and CSE 70 or consent of instructor.*

**174. Introduction to Parallel Computation (4)**  
General introduction to parallel computing, focusing on parallel algorithms and architectures. Parallel models: Flynn's taxonomy, dataflow models. Parallel architectures: systolic arrays, hypercube architecture, shared memory machines, dataflow machines, reconfigurable architectures. Parallel algorithms appropriate to each machine type are also discussed. *Prerequisites: CSE 179, 170B (may be taken concurrently) or consent of instructor.*

**175B. Digital Hardware Laboratory (4)**  
Introduction to common digital integrated circuits: gates, memory circuits, MSI components. Operating characteristics, specifications, and applications. Design of simple combinational and sequential digital systems such as arithmetic processors, game-playing machines. Construction and debugging techniques. One hour's lecture, six hours' laboratory. (Students who have taken ECE 138 may not take CSE 175B for credit.) *Prerequisite: CSE 70. CSE 170A recommended (may be taken concurrently) or consent of instructor.*

**175C. Microprocessor Systems Design (4)**  
Writing and debugging programs on a microprocessor development system. Timing and loading considerations in a system hardware design. A critical comparison of addressing models. I/O structures, interrupt capabilities, and direct memory access techniques. Two hours' lecture, four hours' laboratory. *Prerequisites: CSE 170B (may be taken concurrently). CSE 70 or equivalent, and CSE 175B or equivalent.*

**176. Database System Principles (4)**  
Introduction to database system architecture. Principles of access methods and files; data models, including hierarchical, network, and relational; data definition, manipulation, and query languages; data dependencies, transactions, concurrency, and recovery. Three hours' lecture. *Prerequisite: CSE 161B.*

**177. Computer Graphics (4)**  
Representation of pictorial data. Two-dimensional and three-dimensional transformations and perspective curves, surfaces, and shading. Graphic I/O devices: raster, vector, and storage displays. Graphics software and applications. Three hours' lecture, six hours' laboratory. *Prerequisites: CSE 161A-B and CSE 170A.*

**178A. Artificial Intelligence I (4)**  
The first quarter of a two-quarter undergraduate sequence surveying artificial intelligence. Knowledge representation techniques based on logic, semantic networks, and production systems will be the focus of this course. Theorem proving will also be considered. Assignments will require programming in LISP and PROLOG. *Prerequisites: CSE 162, CSE 160A, and CSE 161A.*

**178B. Artificial Intelligence II (4)**  
Heuristic search of problem state spaces, planning and problem-solving techniques will be considered. Applications in natural language and vision, the expert systems methodology, and topics from machine learning and cognitive science will also be mentioned. *Prerequisite: CSE 178A.*

**179. Analysis of Algorithms (4)**  
Methods for designing measures of computational cost, for computing the cost of algorithms and for computing the intrinsic costs of common computational tasks. Tasks considered include sorting, tree searching, matrix manipulations, and polynomial evaluation. *Prerequisites: CSE 160A-B and 161A-B.*

**180. Software Engineering (4)**  
Different aspects of software engineering will be studied. Topics include design methods, requirements and specification, validation and program testing, maintenance, and programming methodology. Three hours' lecture. *Prerequisites: CSE 161A-B and CSE 163A.*

**181. Informational Retrieval (4)**  
Introduction to the automatic location of relevant "documents," i.e., samples of free-text like books, articles, electronic mail, etc. *Prerequisites: CSE 161B.*

**195. Teaching (2 or 4)**  
Teaching and tutorial activities associated with courses and seminars. Not more than four units of CSE 195 may be used for satisfying graduation requirements. (P/NP grades only.) Three hours' lecture. *Prerequisite: consent of the department chair.*

**197. Field Study in Computer Science and Engineering (4, 8, 12, or 16)**  
Directed study and research at laboratories away from the campus. (P/NP grades only.) *Prerequisites: consent of instructor and approval of the department.*

**198. Directed Group Study (2 or 4)**  
Computer science and engineering topics whose study involves reading and discussion by a small group of students under direction of a faculty member. (P/NP grades only.) *Prerequisite: consent of instructor.*

**199. Independent Study for Undergraduates (2 or 4)**  
Independent reading or research by special arrangement with a faculty member. (P/NP grades only.) *Prerequisite: consent of instructor.*

## GRADUATE

**261. Applied Computability and Complexity (4)**  
Models of computation: finite automata, context-free grammars, Turing machines, random access machines and circuits. Undecidability. First order logic. Complexity: time and space, theory of NP and P, intractability. Intended for students in the computer engineering program. *Prerequisite: CSE 165 or CSE 265A or equivalent.* A student may not receive credit for both CSE 261 and CSE 265B.

**264A. Software Engineering (4)**  
General principles in modern software engineering. Both theoretical and practical topics are covered. Theoretical topics include proofs of correctness, programming language semantics, and theory of testing. Practical topics include structured programming, modularization techniques, design of languages for reliable programming, and software tools. *Prerequisites: CSE 161A-B, 163A, 171A, or consent of instructor.*

**264B. Advanced Operating Systems (4)**  
Software engineering principles and techniques which are specifically related to the design and implementation of operating systems. Topics include cooperating sequential processes, resource protection, recoverability, and systems programming language. *Prerequisites: CSE 171A-B or consent of instructor.*

**264C. Advanced Compiler Design (4)**  
Advanced material in programming languages and translator systems. Topics include compilers, code optimization, and debugging interpreters. *Prerequisites: CSE 161A-B, 163A-B, or consent of instructor.*

**264D. Database Systems (3)**  
Database models including relational, hierarchic, and network approaches. Implementation of databases including query languages and system architectures. *Prerequisites: CSE 161A-B or consent of instructor.*

**265A. Automata, Formal Languages, and Computability (4)**  
(Formerly CSE 265A-B-C.) Finite automata: non-determinism, regular expressions, regular grammars, 2-way FSAs, minimal stated FSAs, context-free languages: normal forms, pumping lemmas, recognition algorithms, push-down automata, DCFLs. Turing Machines; variations on TMs, recursive and r.e. sets, universal TMs, Church's thesis, diagonalization, reducibility,



Chomsky Hierarchy. *Prerequisites: CSE 165 or equivalent; consent of instructor.*

**265B. Computability and Complexity (4)**

(Formerly CSE 265A-B-C.) Undecidability, recursive and r.e. sets. Recursive function theory, primitive and general recursive functions. Time and space complexity. Theory of NP: reducibilities, approximation, completeness. Intractability and complete problems for EXPSPACE. *Prerequisites: CSE 265A and consent of instructor.*

**265C. Complexity of Intractability (4)**

(Formerly CSE 265A-B-C.) Intractability. Relativized complexity. Circuit complexity: size and depth, alternation. Efficient and optimal algorithms: matrix and arithmetic. Axiomatic complexity. Other advanced topics. *Prerequisites: CSE 265B and consent of instructor.*

**268A. Combinatorial Algorithms (4)**

This course presents combinatorial algorithms commonly used in computer science. These algorithms include shortest paths, maximum flow, multi-terminal maximum flows, PERT network, dynamic programming, backtrack, binary trees, greedy algorithms, and matrix computation. *Prerequisite: consent of instructor.*

**268B. Mathematical Programming (4)**

Convex function, separating hyperplanes. Linear programming, simplex method, quality complementary slackness. Revised simplex method, column-generating techniques in LP. Integer programming. *Prerequisite: consent of instructor.*

**268C. Topics in Complexity of Algorithms and Data Structures (4)**

Advanced topics in concrete complexity, including decision trees and branching programs, advanced data structures, boolean circuits, communication complexity, and randomized algorithms. Content may vary from year to year; may be repeated for credit with consent of instructor.

**269. Special Project in Computer Science (1-8)**

The student will conceive, design, and execute a project in computer science under the direction of a faculty member. The project will typically include a large programming or hardware design task, but other types of projects are possible. One-six units may be repeated to a total of nine units. *Prerequisite: admission to the M.S. program in computer science. (S/U grades only.)*

**270A. Principles in Computer Architecture I (4)**

Architectural description tools, performance evaluation, uni-processor issues, including I-unit and E-unit concepts, RISC/CISC issues, bottlenecks, I/O channels and processors, micro- and nano-programming, memory hierarchy, virtual machines, high-level language machines. Performance enhancements: pipelining, instruction lookahead, branch prediction, reduced semantic dependencies. *Prerequisite: CSE 170B or consent of instructor.*

**270B. Principles in Computer Architecture, II (4)**

Traditional and current topics in parallel computer architecture, including Amdahl effect, attached processors, vector supercomputers, SIMD machines, MIMD machines, degrees of coupling, interconnection networks, memory issues, systolic arrays. Networks and distributed systems, massive parallelism, neural networks, shared memory model. *Prerequisite: CSE 270A or consent of instructor.*

**273. Principles of Programming Languages (4)**

Functional versus imperative programming. Type systems and polymorphism; the ML language. Higher order functions, lazy evaluation. Abstract versus concrete syntax, structural and well-founded induction. The lambda calculus, reduction strategies, combinators. Denotational semantics, elementary domain theory. *Prerequisite: CSE 173 or equivalent, or consent of instructor.*

**278A. Advanced Artificial Intelligence I (4)**

Issues in knowledge representation (using logic, semantic networks, production systems, and connectionist representations) will be the focus of this course. A discussion of logic programming languages (like PROLOG) and automatic theorem proving will then lead to a discussion of heuristic search. *Prerequisite: CSE 178B or equivalent.*

**278B. Advanced Artificial Intelligence II (4)**

This course will discuss knowledge representations used to search for solutions, make deductions, plan, and problem solve. The application of these techniques to "expert systems" will be mentioned. Machine learning will also be a major topic of this course. *Prerequisite: CSE 278A.*

**279. Algorithm Design and Analysis (4)**

The basic techniques for the design and analysis of algorithms. Divide-and-conquer, dynamic programming, data structures, graph search, algebraic problems, randomized algorithms, lower bounds, probabilistic analysis, parallel algorithms.

**280A. Special Studies in Computer Science (1-4)**

(Formerly CSE 280.) Topics of special interest in computer science to be presented by staff members and graduate students under faculty direction. Subject matter to be announced before each quarter. (S/U grades only.) *Prerequisite: consent of instructor.*

(Offered as faculty resources permit.)

**280Z. Advanced Topics in Database Theory (2)**

(Formerly CSE 280.) The seminar will cover current research topics in database theory. Specific topics covered will depend on participants' interests. (S/U grades only.) *Prerequisite: consent of instructor.*

(Offered as faculty resources permit.)

**281A. Special Topics in Computer Science (1-8)**

(Formerly CSE 281.) A course—to be given at the discretion of the faculty—at which topics of current interest in computer science will be presented by visiting or resident faculty members. (S/U grades permitted.) *Prerequisite: consent of instructor.*

(Offered as faculty resources permit.)

**281B. System Support for Parallel Computation (4)**

This course explores design issues arising out of system support for parallel computation, with an emphasis on software issues germane to numerical applications. Topics include: workload decomposition strategies, programming models, and classification of applications.

**281C. Parallel and Distributed Computation (4)**

The course concentrates on developing easy to parallelize numerical algorithms for optimization without being specific on the implementation. Topics are selected from iterative methods for linear and nonlinear equations; network problems; asynchronous algorithms, and partially asynchronous iterative methods. *Prerequisite: consent of instructor.*

**281D. Application of Combinatorial Algorithms to CAD (4)**

Description of models in VLSI design. Current literature in CAD. Application of combinatorial algorithms and mathematical programming techniques to circuit layout, array computation, etc.

**281E. Dependable Distributed Systems (4)**

The course introduces the basic concepts that underlie the design of fault-tolerant systems and discusses the key hardware and software issues that arise when one builds a dependable system. For each issue we present known solutions and design alternatives and give examples of commercial and research systems that adopt one approach or the other. *Prerequisite: CSE 166, CSE 171, or consent of instructor.*

**281F. Storage Systems (4)**

Secondary and tertiary storage; performance, reliability; disk arrays; RAID, striping, log and MDS organizations, spares. *Prerequisite: CSE 161, CSE 171, or consent of instructor.*

**281L. Advanced Computer Networks (4)**

Computer communication network concepts, techniques, protocols, and architectures, with emphasis on analysis of algorithms and protocols, performance trade-offs, and design methodologies. Topics will include layering, data link control, routing, flow control, topological design, performance evaluation techniques (measurements, analysis, and simulation). *Prerequisite: CSE 166 or consent of instructor. (S/U grades permitted.)*

(Offered as faculty resources permit.)

**281M. Computer Vision (4)**

Illuminant, surface, and camera models. The role of irradiance, chrominance, stereo disparity, optical flow, and texture in computing interpretations of images. Edge detection, image segmentation, local and global constraints from segment boundaries. Object representations and algorithms for recognition. Extremum problems in vision, including regularization and maximum-likelihood techniques. Relation to human vision. (S/U grades permitted.)

(Offered as faculty resources permit.)

**281N. Distributed Computation (4)**

(Formerly CSE 281.) Distributed computation and communication; resource management: naming, synchronization, concurrency control, fault tolerance, security; performance measures; applications: files, databases, operating systems. (S/U grades permitted.) *Prerequisite: consent of instructor.*

(Offered as faculty resources permit.)

**281P. Connectionists Models and Cognitive Processes (4)**

(Formerly CSE 281.) This course will explore connectionist (or parallel distributed processing) models and their relation to cognitive processes. The course will cover various learning algorithms and the application of the paradigm to models of language processing, memory, sequential processes, and vision. (S/U grades permitted.) *Prerequisites: CSE 278B or equivalent experience.*

(Offered as faculty resources permit.)

**281Q. Topics in Distributed Artificial Intelligence (4)**

(Formerly CSE 281.) Topics in distributed artificial intelligence, including task decomposition; organizational structures; dealing with uncertainty; global coherence; decentralized decision making; cooperation and coordination techniques; computation vs. communication tradeoffs; real-time decentralized control; survey of past work. (S/U grades permitted.) *Prerequisite: graduate standing, consent of instructor, CSE 278B recommended.*

(Offered as faculty resources permit.)

**281R. Computer Systems Performance Evaluation (4)**

(Formerly CSE 281.) Topics in the evaluation of computer systems performance, including definition of performance indices; measurement techniques; analytic and simulation techniques; workload characterization; tuning therapies and self-tuning mechanisms; performance of computer networks and distributed systems; parallel program performance. (S/U grades permitted.) *Prerequisites: CSE 264B and consent of instructor.*

(Offered as faculty resources permit.)

**281S. Knowledge Bases (4)**

(Formerly CSE 281.) The course will cover a variety of topics lying at the intersection of databases and artificial intelligence. Possible topics include reasoning about knowledge; logic and complexity; logic and probability (0/1 laws); logic programming for databases representing and handling negative, incomplete, and indefinite (disjunctive) information; deductive databases; logic databases; "smart" query systems. (S/U grades permitted.) *Prerequisite: consent of instructor.*

(Offered as faculty resources permit.)



## ELECTRICAL AND COMPUTER ENGINEERING

### 281T. Machine Learning (4)

(Formerly CSE 281.) This course will discuss a wide range of techniques used to allow computers to learn directly from experience with their environment rather than requiring programming by humans. The survey will span both high- and low-level learning techniques as well as theoretical models that allow these various techniques to be compared. (S/U grades permitted.) *Prerequisite: 278B.*  
(Offered as faculty resources permit.)

### 281U. Design Systems for VLSI Circuits I (4)

(Formerly CSE 281.) Introduction to VLSI circuits; layout design entry; logic design entry; symbolic layout; layout compaction; logic simulation; circuit simulation; design for testability; two-level logic synthesis; multi-level logic synthesis. (S/U grades permitted.) *Prerequisite: consent of instructor.*  
(Offered as faculty resources permit.)

### 281V. Design Systems for VLSI Circuits II (4)

(Formerly CSE 281.) Microarchitecture synthesis; logic synthesis; synthesis systems for testability insertion; intelligent silicon compilation; synthesis systems for digital signal processing; expert systems in design automation; control unit synthesis; hardware description language issues; design automation databases. (S/U grades permitted.) *Prerequisite: consent of instructor.*  
(Offered as faculty resources permit.)

### 281W. Natural Language Processing (4)

(Formerly CSE 281.) A survey of the traditional approaches to natural language processing, including basic parsing, knowledge representation, and discourse analysis. Material covered in the survey will be chosen from such topics as augmented transition networks, case grammars, semantic networks, and unification grammar. (S/U grades permitted.) *Prerequisite: graduate standing and either 178B or consent of instructor.*  
(Offered as faculty resources permit.)

### 281X. Parallel Algorithms (4)

(Formerly CSE 281.) An introductory course in parallel algorithms. Introduction to the models of parallel computation: parallel random access machines, circuits and networks; desirable and feasible models; routing in networks; unbounded Fanin parallelism; parallel comparison problems; parallel graph algorithms; probabilistic algorithms; other current topics. (S/U grades permitted.) *Prerequisites: CSE 179 and CSE 265B or consent of instructor.*  
(Offered as faculty resources permit.)

### 281Y. Topics in Parallel Computation (4)

(Formerly CSE 281.) This course focuses on the interrelationship of parallel architectures, algorithms, programming environments, Flynn's taxonomy, shared vs. non-shared memory, dataflow, VLSI models, PRAM, type architectures, paracomputer. Programming environments: program decomposition, mapping, debugging, language issues. (S/U grades permitted.) *Prerequisite: graduate standing.*  
(Offered as faculty resources permit.)

### 281Z. Topics in Parallel Complexity Theory (4)

(Formerly CSE 281.) Advanced seminar in theoretical aspects of parallelism, including variants of parallel computation thesis, circuits and PRAM models, speedup of sequential computations, universal parallel machines, inherently sequential problems, complexity classes AC, NC, SC. (S/U grades permitted.) *Prerequisite: CSE 265B and consent of instructor.*  
(Offered as faculty resources permit.)

### 282. Faculty Research Seminar (1)

Computer science and engineering faculty will present one hour seminars of the current research work in their areas of interest. *Prerequisite: CSE graduate status.*

### 298. Independent Study (1-16)

Open to properly qualified graduate students who wish to pursue a problem through advanced study under the direction of a

member of the staff. (S/U grades only.) *Prerequisite: consent of instructor.*

### 299. Research (1-16)

*Prerequisite: consent of instructor. (S/U grades only.)*

### 501. Teaching (1-16)

Teaching and tutorial activities associated with courses and seminars. Not required for candidates for the Ph.D. degree. Number of units for credit depends on number of hours devoted to class or section assistance. (S/U grades only.) *Prerequisite: consent of department chair.*

## ELECTRICAL AND COMPUTER ENGINEERING (ECE)

OFFICE: 2904 Engineering Building, Unit 1,  
Warren College

### Professors

Victor C. Anderson, Ph.D., *Professor Emeritus*  
Peter M. Asbeck, Ph.D.  
H. Neal Bertram, Ph.D.  
William S. C. Chang, Ph.D.  
William A. Coles, Ph.D.  
Jules A. Fejer, D.Sc., *Professor Emeritus*  
Carl W. Helstrom, Ph.D. *Professor Emeritus*  
Walter Ku, Ph.D.  
S. S. Lau, Ph.D.  
Sing H. Lee, Ph.D.  
Robert Lugannani, Ph.D.  
Huey-Lin Luo, Ph.D.  
Elias Masry, Ph.D.  
D. Asoka Mendis, Ph.D.  
Laurence B. Milstein, Ph.D.  
Barnaby J. Rickett, Ph.D.  
Manuel Rotenberg, Ph.D., *Chair*  
M. Lea Rudee, Ph.D., *Dean, Division of Engineering*  
David Sworder, Ph.D., *Associate Dean, OGSR*  
Charles W. Tu, Ph.D.  
Andrew J. Viterbi, Ph.D.  
Harry H. Wieder, Ph.D.  
Jack K. Wolf, Ph.D.

### Associate Professors

Clark Guest, Ph.D.  
Sadik Esener, Ph.D.  
Shaya Fainman, Ph.D.  
George J. Lewak, Ph.D., *Professor Emeritus*  
Kevin B. Quest, Ph.D.  
Bhaskar Rao, Ph.D.  
Ramesh Rao, Ph.D.  
Anthony Sebald, Ph.D.  
Paul Yu, Ph.D.

### Assistant Professors

Shankar Chatterjee, Ph.D.  
Paul M. Chau, Ph.D.  
Rene L. Cruz, Ph.D.  
Ronald D. Fellman, Ph.D.  
Karen L. Kavanagh, Ph.D.  
Kenneth Kreutz-Delgado, Ph.D.  
Ting-Ting Y. Lin, Ph.D.  
Edward T. Yu, Ph.D.

### Adjunct Professors

Robert Hecht-Nielsen, Ph.D., *Hecht-Nielsen Neurocomputing Corporation*  
James U. Lemke, Ph.D., *Center for Magnetic Recording Research*  
Constantin Politis, Ph.D., *Inst. for Nuclear Solid State Physics, Germany*  
Terrence Sejnowski, Ph.D., *Department of Biology*  
James Zeidler, Ph.D., *Naval Ocean Systems Center*

### Associated Faculty

Gustaf O. S. Arrhenius, Ph.D., *Professor, Scripps Institution of Oceanography*  
William B. Hodgkiss, Ph.D., *Professor, Scripps Institution of Oceanography*

## THE UNDERGRADUATE PROGRAMS

The Department of Electrical and Computer Engineering offers undergraduate programs that lead to a **B.S. degree** in electrical engineering, computer engineering, or engineering physics.

In the **electrical engineering** program students initially learn the basic engineering concepts in a common curriculum and then must choose one of six specialized options, corresponding to the major divisions of modern electrical engineering: **communications systems, electronic circuits and systems, electronic devices and materials, photonics, robotics and control, and systems and control.** The electrical engineering program has been accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, Inc. (ABET). The **computer engineering** program treats hardware design, data storage, computer architecture, assembly languages, and the design of computers for engineering, information retrieval, and scientific research. The computer engineering program is conducted jointly with the Department of Computer Science and Engineering. The **engineering physics** program provides a strong background in physics and mathematics and permits specialization in acoustics, optics, solid state electronics, continuum mechanics, or materials science. The program is conducted in cooperation

with the Department of Physics and the Department of Applied Mechanics and Engineering Sciences (AMES).

In addition to the B.S. programs, ECE offers programs that lead to the **B.A. degree in applied physics or information science**. These degrees are designed for students who desire more time for undergraduate studies outside their major subject. A range of specializations is available as in the B.S. degrees, but with only fifteen upper-division courses required, there is necessarily less depth in the coverage. Applied physics emphasizes topics such as electromagnetism, electronics, solid state devices, and optical or acoustical information processing. Information science emphasizes communication systems and the processing of information.

For information about admission to the program and about academic advising, students are referred to the section on ECE departmental regulations. In order to complete the programs in a timely fashion, students must plan their courses carefully, starting in their freshman year. Students should have sufficient background in high school mathematics so that they can take freshman calculus in their first quarter.

Students who maintain a distinguished scholastic record in departmental programs through the junior year are encouraged to apply for the **five-year B.S./M.S. or B.A./M.S. program**. This is accomplished by applying for admission to the graduate program in the spring quarter of the junior year. Students accepted in the program may enroll in graduate courses and can complete the requirements for a master's degree within one year after receiving the bachelor's degree. The choice of electives must be approved by the student's adviser.

## B.S. CURRICULA

The B.S. programs have extensive lower-division requirements, in addition to the upper-division requirements, which in electrical engineering and computer engineering are twenty-one courses, and twenty-one to twenty-two courses in engineering physics. For graduation, each student must also satisfy general-education requirements determined by the student's college. In order to graduate in four years with a B.S. degree a student should enroll for approximately eighteen units for three quarters and sixteen units for the nine remaining quarters. Enrolling in Summer Session courses can be of some help in meeting a four-year goal. However, the five colleges at UCSD require widely different numbers of general-education courses. Students should choose their college carefully, considering the special

nature of the college and breadth of education. They should realize that some colleges require considerably more courses than others, making it impossible to complete a B.S. program in four years. Students wishing to transfer to another college should see their college adviser. Graduates of junior colleges may enter ECE programs in the junior year. However, transfer students should be particularly mindful of the sophomore-year course requirements when planning their programs. Students are required to discuss their curriculum with the appropriate departmental adviser no later than the spring quarter of their freshman year, and then at least once a year until graduation.

## ELECTRICAL ENGINEERING

The electrical engineering curriculum comprises studies in communication systems, electronic circuits and systems, electronic devices and materials, photonics (or opto-electronic engineering), robotics and control (including intelligent systems), and systems and control. After discussion with a faculty adviser, students should select one of these options. The curriculum in electrical engineering has been accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, Inc. (ABET).

The following sets of courses are given as four-year programs, with college general-education courses noted as GER. Students who do not adhere to this schedule should consult a faculty adviser to ensure that courses are taken in an appropriate order. There is a common lower-division program that is required for all options.

### Lower-Division Requirements— All Options

FALL	WINTER	SPRING
<b>FRESHMAN YEAR</b>		
Math. 2A**	Math. 2B	Math. 2C
CSE 65 or 62B	Phys. 2A*	Phys. 2B
Chem. 6A or 7A	G.E.R. <sup>(1)</sup>	Phys. 2BL
G.E.R. <sup>(1)</sup>	ECE 10	G.E.R. <sup>(1)</sup>
<b>SOPHOMORE YEAR</b>		
Math. 2DA	Math. 2EA	Math. 2F
Phys. 2C	Phys. 2D	ECE 80 or CSE 70
ECE 50A	ECE 50B	ECE 170A
ECE 52AL	ECE 52BL	ECE 175B
Phys. 2CL or 2DL		

\*Math. 2A is the prerequisite for Phys. 2A. Students whose performance on the math. placement test permits them to start with Math. 2B or higher may take Phys. 2A in the fall quarter of the freshman year.

\*\*The honors math. sequence can be substituted for Math. 2A-B-C-DA-EA-F.

<sup>(1)</sup>GENERAL-EDUCATION REQUIREMENT

The **upper-division course** requirements depend on the option selected by the student. The following are the requirements for the various options. T.E. denotes a technical elective, which can be any upper-division course chosen with the approval of the faculty adviser—see the section on ECE undergraduate regulations.

### Communication Systems Option

FALL	WINTER	SPRING
<b>JUNIOR YEAR</b>		
ECE 152A	ECE 152B	ECE 152C
ECE 160A	ECE 160B	ECE 160C
ECE 105A	ECE 171A	T.E.
T.E.		
<b>SENIOR YEAR</b>		
ECE 154A	ECE 154B	ECE 154C
ECE 159A	ECE 158A	ECE 158B
(ECE 161A or 161C or 162A)		ECE 122
T.E.	T.E.	T.E.

### Electronic Circuits and Systems Option

FALL	WINTER	SPRING
<b>JUNIOR YEAR</b>		
ECE 105A	ECE 105B	
ECE 152A	ECE 152B	ECE 152C
ECE 160A	ECE 160B	ECE 160C
ECE 135A	ECE 171A	T.E.
<b>SENIOR YEAR</b>		
ECE 121A	ECE 121B	ECE 121C
ECE 161A	ECE 161B	
	ECE 162A	ECE 161C or 162B
T.E.	T.E.	T.E.

### Electronic Devices and Materials Option

FALL	WINTER	SPRING
<b>JUNIOR YEAR</b>		
ECE 105A	ECE 105B	ECE 105C
T.E.	ECE 171A	T.E.
ECE 160A	ECE 160B	ECE 160C
ECE 135A	ECE 135B	ECE 134
<b>SENIOR YEAR</b>		
ECE 121A	ECE 121B	ECE 121C
T.E.	ECE 136B	ECE 139
T.E.	T.E.	T.E.

### Photonics Option

FALL	WINTER	SPRING
<b>JUNIOR YEAR</b>		
ECE 105A	ECE 105B	ECE 105C
ECE 160A	ECE 160B	T.E.
ECE 135A	ECE 135B	T.E.
ECE 140A	ECE 140B	ECE 140C
<b>SENIOR YEAR</b>		
ECE 141A	ECE 141B	ECE 141C
ECE 121A	ECE 121B	T.E.
(ECE 162A or 136B or 144A)	T.E.	T.E.

## ELECTRICAL AND COMPUTER ENGINEERING

### Systems and Control Option

FALL	WINTER	SPRING
<b>JUNIOR YEAR</b>		
ECE 105A	ECE 171A	ECE 171B
ECE 152A	ECE 152B	ECE 152C
ECE 160A	ECE 160B	ECE 160C
T.E.	T.E.	T.E.
<b>SENIOR YEAR</b>		
ECE 159A	ECE 159B	ECE 159C
ECE 172A	T.E.	ECE 122
ECE 167	ECE 169	T.E.

### Robotics and Control Option

FALL	WINTER	SPRING
<b>JUNIOR YEAR</b>		
ECE 105A	ECE 105B	T.E.
ECE 152A	ECE 152B	ECE 152C
ECE 160A	ECE 160B	CSE 170B
T.E.	ECE 171A	ECE 171B
<b>SENIOR YEAR</b>		
ECE 176A	ECE 176B	ECE 176C
ECE 172A	ECE 172B	T.E.
ECE 167	(ECE 169 or CSE 175C)	ECE 177

## COMPUTER ENGINEERING

Students wishing to take the computer engineering curriculum must be admitted to either the ECE or CSE department. The set of required courses and allowed electives is the same in both departments.

The computer engineering program offers a strong emphasis on engineering mathematics and other basic engineering science as well as a firm grounding in computer science. Students should have sufficient background in high school mathematics so that they can take freshman calculus in their first quarter. Courses in high school physics and computer programming, although helpful, are not required for admission to the program.

FALL	WINTER	SPRING
<b>FRESHMAN YEAR</b>		
Math. 2A	Math. 2B	Math. 2C
CSE 62B or 65*	Phys. 2A†	Phys. 2B
Chem. 6A or 7A	Chem. 6B or 7B	Phys. 2BL
G.E.R. <sup>(1)</sup>	ECE 10	G.E.R. <sup>(1)</sup>
<b>SOPHOMORE YEAR</b>		
Math. 2D or 2DA	Math. 2E or 2EA	Math. 2F
Phys. 2C	Phys. 2D	ECE 80 or CSE 70
ECE 50A	ECE 50B	(ECE 170A or CSE 170A)
ECE 52AL	ECE 52BL	(ECE 175B or CSE 175B)
Phys. 2CL or 2DL		
<b>JUNIOR YEAR</b>		
ECE 152A	ECE 171A	CSE 175C
CSE 160A	CSE 160B	T.E. <sup>(2)</sup>
ECE 105A	CSE 170B	CSE 170C
ECE 160A	ECE 160B	T.E. <sup>(2)</sup>

<b>SENIOR YEAR</b>		
ECE 167	CSE 182	CSE 171B
CSE 161A	CSE 161B	CSE 180
CSE 171A	CSE 163A	T.E. <sup>(2)</sup>

\*Please note that CSE 62A is a prerequisite for CSE 62B, and if you have not taken an equivalent course, you will need to start with CSE 62A in the fall and pick up CSE 62B in the winter.

†Math. 2A is the prerequisite for Phys. 2A. Students whose performance on the math. placement test permits them to start with Math. 2B or higher may take Phys. 2A in the fall quarter of the freshman year.

Physics 4A,B,C,D,E can be substituted for Physics 2A,B,C,D and Chemistry 6B (or 7B)

<sup>(1)</sup>GENERAL-EDUCATION REQUIREMENT

<sup>(2)</sup>TECHNICAL ELECTIVES: Any upper-division or graduate course from either the ECE or CSE department, except ECE 160B, may be used as a technical elective.

## ENGINEERING PHYSICS

The engineering physics degree combines a strong program in physics with most of the requirements for a B.S. degree in electrical or mechanical engineering. It comprises options in acoustics, optics, continuum mechanics, materials science, and solid state electronics. Any one of these options should be selected by the student; note that these programs may have no technical electives and specify twenty-one to twenty-two upper-division courses. T.E. denotes a technical elective, which can be any upper-division course chosen with the approval of the faculty adviser—see the section on ECE undergraduate regulations.

### Lower-Division Requirements— All Options

FALL	WINTER	SPRING
<b>FRESHMAN YEAR</b>		
CSE 65 or 62B	Phys. 2A	Phys. 2B
Chem. 6A or 7A	Math. 2B	Phys. 2BL*
Math. 2A	G.E.R. <sup>(1)</sup>	Math. 2C
G.E.R. <sup>(1)</sup>	(ECE 10 or 80 or CSE 70)	G.E.R. <sup>(1)</sup>
<b>SOPHOMORE YEAR</b>		
Phys. 2C	Phys. 2D	G.E.R. <sup>(1)</sup>
Phys. 2CL*	Phys. 2DL*	G.E.R. <sup>(1)</sup>
Math. 2DA	Math. 2EA	Math. 2F
ECE 50A	ECE 50B	ECE 170A

\*or ECE 52AL-BL, Phys. 2DL.

<sup>(1)</sup>GENERAL-EDUCATION REQUIREMENT

The upper-division course requirements depend on the option selected by the student. The following are the requirements for the various options.

### Acoustics Option

FALL	WINTER	SPRING
<b>JUNIOR YEAR</b>		
ECE 105A	ECE 105B	ECE 105C
ECE 160A	ECE 160B	
ECE 152A	ECE 152B or 171A	ECE 152C or 160C
Phys. 110A	Phys. 110B	AMES 110

<b>SENIOR YEAR</b>		
ECE 145AL	ECE 145BL	ECE 145CL
(ECE 121A	ECE 121B	ECE 121C) or
(Phys. 100A	Phys. 100B	Phys. 100C)
Phys. 130A	Phys. 130B	Phys. 152
AMES 101A	AMES 101B	

### Continuum Mechanics Option

FALL	WINTER	SPRING
<b>JUNIOR YEAR</b>		
AMES 130A	AMES 130B	AMES 130C
ECE 105A	ECE 105B	ECE 105C
(ECE 160A	ECE 160B) or	AMES 110
(AMES 170	AMES 171A)	
(Phys. 110A	Phys. 110B) or	
(AMES 121A	AMES 121B)	
<b>SENIOR YEAR</b>		
AMES 101A	AMES 101B	AMES 101C
Phys. 130A	Phys. 130B	Phys. 152
(ECE 121A	ECE 121B	ECE 121C) or
(Phys. 100A	Phys. 100B	Phys. 100C)
Phys. 140A	Phys. 140B	

### Material Science Option

FALL	WINTER	SPRING
<b>JUNIOR YEAR</b>		
ECE 105A	ECE 105B	ECE 105C
ECE 160A	AMES 102	ECE 137
(Phys. 110A	Phys. 110B) or	ECE 134
(AMES 121A	AMES 121B)	
(ECE 135A or	ECE 135B	ECE 136B
Phys. 152)		
<b>SENIOR YEAR</b>		
(ECE 121A	ECE 121B	ECE 121C) or
(Phys. 100A	Phys. 100B	Phys. 100C)
Phys. 130A	Phys. 130B	T.E.
Phys. 140A	Phys. 140B	T.E.

### Optics Option

FALL	WINTER	SPRING
<b>JUNIOR YEAR</b>		
ECE 105A	ECE 105B	ECE 105C
ECE 160A	ECE 160B	AMES 110
ECE 140A	ECE 140B	ECE 140C
Phys. 110A	Phys. 110B	
<b>SENIOR YEAR</b>		
ECE 141A	ECE 141B	ECE 141C
(ECE 121A	ECE 121B	ECE 121C) or
(Phys. 100A	Phys. 100B	Phys. 100C)
Phys. 130A	Phys. 130B	(Phys. 152 or ECE 136B)
ECE 135A	ECE 135B	

### Solid State Electronics Option

FALL	WINTER	SPRING
<b>JUNIOR YEAR</b>		
ECE 105A	ECE 105B	ECE 105C
ECE 160A	ECE 160B	ECE 160C
ECE 135A	ECE 135B	ECE 136B
T.E.	ECE 171A	ECE 134

SENIOR YEAR (ECE-121A Phys. 100A Phys. 130A Phys. 140A	ECE 121B Phys. 100B Phys. 130B Phys. 140B	ECE 121C) or Phys. 100C) ECE 161C or 139 T.E.
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## THE B.A. CURRICULA

There are majors leading to the B.A. degree in **applied physics** and in **information science**.

### LOWER-DIVISION REQUIREMENTS

The lower-division requirements are the same for both applied physics and for information science.

FALL	WINTER	SPRING
<b>FRESHMAN YEAR</b>		
Math. 2A	Math. 2B	Math. 2C
CSE 65 or 62B	Phys. 2A*	Phys. 2B
Chem. 6A or 7A	G.E.R. <sup>(1)</sup>	Phys. 2BL
G.E.R. <sup>(1)</sup>	ECE 10	G.E.R. <sup>(1)</sup>
<b>SOPHOMORE YEAR</b>		
Math. 2DA	Math. 2EA	G.E.R. <sup>(1)</sup>
Phys. 2C	Phys. 2D	G.E.R. <sup>(1)</sup>
Phys. 2CL or 2DL		
ECE 50A	ECE 50B	ECE 170A
ECE 52AL	ECE 52BL	ECE 175B

\*or Phys. 4A-B-C-D-E

## APPLIED PHYSICS

### Upper-Division Programs

A total of fifteen upper-division courses, approved as a coherent program by the adviser, must be passed with a minimum 2.0 GPA in order to satisfy the requirements of the major program. Of those fifteen, the following are required of all applied physics majors:

- (a) ECE 105A-B-C
- (b) At least two sequences from the following:  
ECE 121A-B-C  
ECE 135A-B, 134  
ECE 140A-B-C  
ECE 160A-B-C
- (c) At least eight units of undergraduate laboratory courses selected from the following:  
ECE 136B, 137  
ECE 167  
ECE 141A-B-C  
ECE 145AL-BL-CL  
Phys. 121  
ECE 161A, 161B  
ECE 160 A-B-C

Electives may be any upper-division physical science or mathematics courses approved by the adviser. The electives should include at least one three-course sequence. Components of four typical major programs are listed below.

### Acoustics

ECE 105A-B-C, 121A-B-C,  
145AL-BL-CL,  
152A-B-C  
AMES 101A-B, AMES 110

### Electronics

ECE 105A-B-C, 121A-B-C, 160A-B-C,  
135A-B, 171A, 136C,  
Any two of (ECE 161A, 161B, 161C or 162A)

### Optics

ECE 105A-B-C, 121A-B-C,  
140A-B-C, 141A-B-C,  
(152A-B-C) or (Phys. 130A-B and ECE 135A)

### Solid State

ECE 105A-B-C, 121A-B-C,  
ECE 160A-B-C  
Any one of (ECE 134, 137 or 144A)  
ECE 135A-B, 136B  
Phys. 130A-B

## INFORMATION SCIENCE

A total of fifteen upper-division courses, approved as a coherent program by the adviser, must be passed with a minimum 2.0 GPA in order to satisfy the requirements of the major program. Options in communication systems, and systems and control are available. See the electrical engineering program for suggested courses in these options.

## MINOR CURRICULA

The following sets of courses represent a variety of minor curricula in the area of electrical engineering and applied physics. A minor will typically consist of one of the following upper-division sequences and three of the lower-division prerequisite courses. Students should note that the upper-division sequences require more than three lower-division courses (e.g., minor #2 requires Math. 2A-B-C-DA-EA-F, Phys. 2A-B-C-D). The upper-division courses must be distinct from courses in the student's major; some overlap may be permissible in the lower-division courses. Students should consult their college provost's office concerning the rules for the minor or program of concentration.

1. Digital Hardware ECE 160A-B, 167
2. Transistors ECE 105A, 135A-B
3. Systems ECE105A, 171A-B
4. Signals ECE 105A, 152A, 152B
5. Optics ECE 140A-B-C
6. Acoustics ECE 145AL-BL-CL
7. Waves ECE 105A, 122, 140B

## UNDERGRADUATE REGULATIONS AND REQUIREMENTS

### ADMISSION TO UPPER-DIVISION COURSES

Admission to upper-division ECE courses is based on the GPA in required lower-division courses. (See "Admission of Majors in the Division of Engineering" in the Division of Engineering portion of this catalog.) Currently, students who have completed the lower-division requirements with at least a C average are admissible as ECE majors. This GPA cutoff level may be raised at any time, when the number of majors exceeds the capacity of the department. The department will attempt to provide sufficient sections to meet the demand in all lower-division courses. Students will, however, be screened to ensure that they meet all the course prerequisites.

Students who wish to enroll in an ECE major should apply to the department undergraduate office, in accordance with the Division of Engineering admissions policy. Rules for transfer students are described below.

Admission to upper-division courses will be restricted to students admitted by the department to a major or minor or those fulfilling a requirement for another major. Admission to all ECE courses requires the departmental stamp on the registration form, obtainable at the ECE undergraduate office. In any course in which enrollment exceeds the capacity of the room or if there is insufficient laboratory equipment, students will be dropped from the course rosters if they do not satisfy these regulations.

### TRANSFER STUDENTS

Requirements for admission to upper-division courses and to the major curricula are the same for transfer students as for continuing students. When planning their program, students should be mindful of lower-division prerequisites necessary for admission to upper-division courses.

Students who wish to enter an ECE major curriculum must apply to the department before the beginning of the fall quarter, submitting course descriptions and transcripts for courses used to satisfy their lower-division requirements. Normally admission will be for the fall quarter; students entering in the winter or spring quarter should be aware that scheduling difficulties may occur because upper-division sequences normally begin in the fall quarter.

### **GRADE REQUIREMENT IN THE MAJOR**

A GPA of 2.0 is required in upper-division courses in the major, including the technical electives.

### **TECHNICAL ELECTIVES**

Any upper-division or graduate course in the ECE, AMES, CSE, physics, or mathematics departments may be selected as a technical elective, with the approval of the student's adviser. However, at most four units of ECE 197, 198, and 199 may be used; these courses may be taken on a Pass/No Pass basis.

### **ADVISING**

Students are required to discuss their curriculum with the appropriate departmental adviser no later than the spring quarter of their freshman year, and then at least once a year until graduation. This is to help both in their choice of option and their choice of technical electives, and to keep them aware of any changes in the requirements. An adviser will be assigned by the ECE department undergraduate office.

### **THE GRADUATE PROGRAMS**

The Department of Electrical and Computer Engineering offers graduate programs leading to **M.S. and Ph.D. degrees** in six areas with the following degree titles: electrical engineering (applied physics), electrical engineering (communication theory and systems), electrical engineering (electronic circuits and systems), electrical engineering (intelligent systems, robotics and control), electrical engineering (computer engineering), and an interdepartmental curriculum in electrical engineering (applied ocean sciences).

Admission is in accordance with the general requirements of the graduate division, which requires at least a B.S. degree in a branch of engineering, physical sciences, or mathematics. Applications from students who wish to take interdisciplinary programs will also be considered. A minimum GPA of 3.0 and strong letters of recommendation are necessary. In addition, the department requires all applicants to submit GRE general test scores; TOEFL scores are required from international applicants whose native language is not English. Applicants are judged competitively. Based on the applicant's background, qualification and goals, admission to a graduate program is made in one of three categories: *M.S. only*, *M.S.*, or *Ph.D.* Admission to the *M.S. only* is designated when the applicant's qualifications are judged to be marginal; the *M.S.* or *Ph.D.* is designated when the applicant

is judged to be appropriately qualified. The latter designations are important to M.S. students who subsequently wish to pursue a Ph.D. program (see "Master's Degree Program" below).

### **APPLIED PHYSICS**

This division includes the following areas of study:

**Radio and Space Science.** Radio science uses a wide variety of ground-based radio observations to remotely probe the ionosphere, the solar wind, and the interstellar medium. On the one hand, the perturbations, caused as radio waves propagate in these irregular and turbulent plasmas, are used to study these regions; on the other hand, such perturbations can distort radio-astronomical observations, and techniques are sought to minimize the distortions and provide an accurate restoration of the intrinsic signals.

Space science is concerned with the nature of the sun, its ionized and super-sonic outer atmosphere (the solar wind), and the interaction of the solar wind with various bodies in the solar system. Theoretical studies are pursued in many aspects of space physics. These include the interaction of the solar wind with the earth, planets and comets; cosmic dusty-plasmas; waves in the ionosphere; the physics of shocks. A major theoretical effort involves the use of supercomputers for modeling and simulation studies of both fluid and kinetic processes in space plasmas.

Our Ph.D. graduates in radio and space science are now actively employed in research and engineering in a wide range of industrial, university, and government organizations. Students are trained in one or more of the interrelated fields—electromagnetics, space plasma physics, radio astronomy, wave propagation, numerical methods, and signal processing. Large-scale computational facilities are available in the group and through the San Diego Supercomputer Center. The radio science projects use the national radio-astronomy facilities in addition to a large dedicated array antenna operating at 74 MHz.

**Electronic Devices and Materials.** The field of electronic devices and materials includes the synthesis, characterization and application of metals, semiconductors and dielectric materials, principally in the form of thin layers. The field of solid state electronics includes the synthesis, construction, evaluation, and modeling of prototype electronic materials and devices and integrated circuits based on silicon and III-V compound semiconductors and processing methods and techniques employed in present-day or projected large-scale integrated circuit applications. Current research includes growth by molecular beam epitaxy and chemical vapor phase epitaxy, the metallurgical aspects of interfaces, the study

of superconductors and tunneling phenomena, magnetic materials, and the electronic, optical, and electro-optic properties of heterojunction structures. The department has available a complete facility for fabricating prototype silicon and III-V compound transistors and other devices, a Rutherford backscattering facility, molecular beam epitaxial apparatus, cryogenic temperature facilities and auxiliary apparatus for x-ray, optical, electro-optic, electrical, and galvanomagnetic characterization of materials, devices, and components.

**Applied Optics and Photonics.** This field involves the application of systems combining optics and electronics to image processing, parallel computing, and fiber optics communication. Current system studies include hybrid optical/electronic processing, optical processing with feedback and nonlinearity, optical associative memory, optical neural nets, robotic vision (optical pattern recognition), and digital optical computing systems. Algorithmic and architectural studies on these parallel optical processing systems are complemented by studies on opto-electronic devices involving optical spatial light modulators as logic and memory devices, nonlinear optical crystals for image amplification, logic and 3-D memory, and computer-aided designed diffractive optics and micro-optics for optical interconnects used in optical processors and VLSI circuits. Integrated optical circuits, fiber optics, guided wave modulators, integrated optical and electronic devices on III-V semiconductors, semiconductor injection lasers and detectors are studied for optical communication. The applied optics program has available extensive facilities for optical system and device research. A number of lasers (e.g., argon, krypton, dye, carbon dioxide, helium neon, color center, Nd/YAG, and gallium arsenide lasers), detectors, infra-red vidicons, spectrometers, interferometers, a considerable amount of high-quality optics and more than fifteen vibration-isolation tables are available. In addition to research into new types of spatial light modulators, several liquid crystal light valves, microchannel/spatial light modulators, and a Pockels readout optical modulator are available. Facilities available for microfabrication of optoelectronic circuits and devices including an r.f. and magnetron sputtering system, plasma etching, reactive ion beam etching, plasma enhanced chemical vapor deposition, low-pressure chemical vapor deposition pyrogenic oxidation, liquid-phase epitaxy system, molecular beam epitaxy system CAD workstations, an electron beam, and a photo lithography facility, and diffusion furnaces.

**Magnetic Recording.** Magnetic recording is an interdisciplinary field involving physics, mate-



rial science, communications, and mechanical engineering. The physics of magnetic recording involves studying magnetic heads, recording media, and the process of transferring information between the heads and the medium. General areas of investigation include: nonlinear behavior of magnetic heads, very high-frequency loss mechanisms in head materials, characterization of recording media by micromagnetic and many body interaction analysis, response of the medium to the application of spatially varying vectorial head fields, fundamental analysis of medium nonuniformities leading to media noise, and experimental studies of the channel transfer function emphasizing nonlinearities, interferences, and noise.

Current projects involve utilization of the San Diego Supercomputer Center at UCSD to perform numerical simulations of high-density digital recording in metallic thin films, micromagnetic analysis of magnetic reversal in individual magnetic particles again utilizing the Cray, theory of recorded transition phase noise and magnetization induced nonlinear bit shift in thin metallic films, and analysis of the thermal-temporal stability of interacting fine particles.

Facilities for theoretical and experimental research are in the 44,000 square foot Center for Magnetic Recording Research building. Experimental equipment include a large-scale sputterer for disc media preparation, state-of-the-art computer controlled vibrating magnetometer, and precision tape and disc drives for recording studies. The center maintains its own computational facility for use by supported students and faculty.

### **COMMUNICATION THEORY AND SYSTEMS**

Communication theory and systems in ECE involves the detection of signals, the prediction and filtering of random processes, the design and analysis of communication systems, the analysis of protocols for communication networks, and statistical processing of images. Specific topics include the use of signal processing and error correction techniques for both digital communication systems and recording data in magnetic storage media, the use of spread spectrum techniques for wireless communications, and the design and analysis of multiuser communication networks. Additional areas of research include time series analysis, adaptive filtering, sampling design, and wavelet theory. Applications are made to such fields as communications, radar, sonar, oceanography, holography, image processing, and visibility in air and water. Both theoretical and practical aspects of

information processing are studied. Both the M.S. and the Ph.D. degrees are offered.

### **ELECTRONIC CIRCUITS AND SYSTEMS**

Electronic circuits and systems (ECS) in the Department of ECE involves the study of the analysis, design, and synthesis of electronic circuits and systems. There is emphasis on analog and digital integrated circuits, very large-scale integration (VLSI), analog and digital signal processing, and system algorithms and architectures. The ECS division includes the following areas of study: analog, digital, and microwave electronic circuits and systems, parallel and multiprocessor computing, electronic neural networks and associative memories, VLSI and algorithmic/application-specific integrated circuit (ASIC) design, microwave and millimeter wave integrated circuits (MIMIC), gallium arsenide ultra-high-speed integrated circuits and devices (UHSIC), algorithms and architectures for analog and digital signal processing (DSP), high-speed digital communications, computer arithmetic and numerical analysis of finite word length processors, fault-tolerant VLSI systems, design for testability, the design of reliable digital electronic systems, computer-aided design (CAD), and computer-aided engineering (CAE) of DSP/communications systems.

### **INTELLIGENT SYSTEMS, ROBOTICS AND CONTROL**

This field focuses on the application of advanced computer and mathematical techniques to the problem of analysis and control of complex, uncertain dynamical systems in real time.

Consider, for example, the closed loop control of multiple robot arms in a changing environment. The intent is for the arms to cooperate in the performance of some complex task. The control loop is subject to external disturbances (e.g., changes in the environment), and the robot structural properties vary with changing loads. Measurement of the relevant states is made by conventional position or force sensors as well as image sensors (video cameras). These measurements are subject to both noise—random perturbations in the sensor outputs and artifacts (e.g., partial obscuration of the image field.) The need for good planning and control for nominal performance as well as proper emergency capability also complicates the design problem. The system must operate properly in a wide range of operating modes.

Similar issues arise in biomedical control problems and aerospace guidance and control problems. All of these designs require fusion of a

complicated suite of sensors, computers, and problem dynamics into one integrated system. Again, the wide range of events to which the system is subject create an environment in which the controller must adapt itself to its perception of the operational conditions.

Faculty in the systems science group are involved in virtually all aspects of the field. Individual faculty are focusing on topics, including biomedical identification and control, advanced digital signal and image processing, image-based tracking and guidance systems, control of teleoperated vehicles, analysis and control of mobile multiarmed robot manipulators, and the integration of nontraditional approaches including neural networks, fuzzy adaptive control, and rule-based descriptions from LISP and PROLOG. Typically, advanced mathematical and computational techniques play the fundamental role in this work. Extensive computational support includes the UCSD CRAY (on campus) and a network of workstations.

In summary, the group is interested primarily in the study of intelligent systems.

### **COMPUTER ENGINEERING**

The computer engineering program, jointly administered between the CSE and ECE departments, offers the M.S. and Ph.D. degrees. Computer engineering explores the engineering analysis and design aspects of algorithms and technology. Specific research areas include computer systems, signal processing systems, multiprocessing, architecture, networks, computer-aided design, fault tolerance, data storage systems, and neuro-computing.

### **APPLIED OCEAN SCIENCES**

The Graduate Department of the Scripps Institution of Oceanography, the Department of Electrical and Computer Engineering, and the Department of Applied Mechanics and Engineering Sciences offer an interdepartmental program in applied science related to the oceans. All aspects of humans' purposeful and unusual intervention into the sea are included. Students who enroll will receive the degree of Ph.D. upon completion of normal departmental requirements and certain others stipulated by an interdepartmental faculty committee.

### **ECE GRADUATE REQUIREMENTS AND REGULATIONS**

#### **COURSE AND EXAMINATION REQUIREMENTS**

To complete the M.S. program, the course requirements must be satisfied and either a mas-

ter's thesis must be written (Plan I) or the comprehensive examination must be passed (Plan II).

The course requirements for the Ph.D. program are the same as those for the M.S. The same comprehensive examination is required for the Ph.D. program, but the passing level is somewhat higher. In addition, a departmental research examination must be passed. This is followed by the University Qualifying Examination, the submission of a thesis and a final thesis examination (as described under the "Graduate Studies" section of this catalog).

The **comprehensive examination**, which is required for both Plan II M.S. students and for Ph.D. students, is a written exam based on topics appropriate to each discipline, at the advanced undergraduate level. The details of the choice of exam topics and scheduling are available from the ECE graduate office. Incoming graduate students must take the exam before the end of their first year of enrollment. Students with good undergraduate preparation should take it during their first fall quarter. It is also offered in the spring quarter each year. It can be repeated once, but only at the next time it is offered. Students, who are admitted already holding an M.S. degree, must nevertheless pass the comprehensive exam to obtain a second M.S. degree or to proceed toward a Ph.D. Students in the area of intelligent systems, robotics and control are also required to take an oral exam on their graduate course work—see listing below.

Students who were admitted to study for the M.S. only may, upon completion of the requirements of the M.S. (Plan II) program, apply for admission to the Ph.D. program. Their applications will be judged in competition with those of new students applying for admission to study for the Ph.D. degree. Performance in the core courses and on the comprehensive examination will be taken into account.

### **DEPARTMENTAL PH.D. TIME LIMIT POLICY**

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed seven years (six years with master's degree). Total registered time at UCSD cannot exceed eight years (seven years with master's degree).

### **FINANCIAL AID**

Financial support is available to qualified graduate students in the form of fellowships, loans, and assistantships. Half-time research assistants and half-time teaching assistants are paid (slightly different) monthly stipends, with preference given to students in the Ph.D. pro-

gram. There is also the possibility of employment during the summer months. Application forms for admission and financial support can be obtained from the ECE graduate office.

## **MASTER'S DEGREE PROGRAMS**

The general requirements for the degree of master of science are stated in the "Graduate Studies" section of the catalog. The purpose of the M.S. program is to equip engineers with fundamental knowledge in their fields; to extend an undergraduate background, or to expose practicing engineers to current theories and technologies. The degree may be terminal or may be used as a step toward the Ph.D. Normally no financial support is offered to students enrolled in the M.S. program.

To complete the M.S. program, the course requirements must be satisfied and either a master's thesis (Plan I) must be written or the comprehensive examination (Plan II) must be passed.

The **course requirements** for an M.S. degree are specified below under the various disciplines within the department. Typically, six to nine core courses and technical electives to make up a total of forty-eight units are required (note that this is greater than the thirty-six units required by the university). These requirements are the same for Plans I and II, except in three disciplines (communication theory and systems, electronic circuits and systems, and intelligent systems, robotics and control) for which only forty-four units are required for Plan I students. However, Plan I also requires six units of research with an adviser under ECE 298 or 299.

### **APPLIED PHYSICS**

The M.S. program in electrical engineering (applied physics) includes the fields of radio and space science, electronic devices and materials, applied optics and photonics, and magnetic recording. The program allows the students to deepen their understanding in the field of their choice.

#### **Course Requirements**

The following core courses are required:  
 Math. 210A-B-C or AMES 294A-B-C  
 And any two sequences (twenty-four units) selected normally from the following:  
 ECE 222A-B-C  
 ECE 230A-B-C  
 ECE 240A-B-C  
 ECE 245A-B-C  
 ECE 251A-B-C  
 Phys. 211, Phys. 212A-B

In addition, elective courses to complete a total of forty-eight units must be taken.

### **COMMUNICATION THEORY AND SYSTEMS**

The M.S. program in communication theory and systems stresses the principles underlying the analysis and design of modern communication, remote-detection, and image-processing systems. Plan II students with a good undergraduate background can complete the course and exam requirements in one year of full-time study.

#### **Course Requirements**

The following courses are required:

ECE 250A, ECE 256A, ECE 254A

Also one sequence from Group A and any two quarter-courses from Group B:

Group A

ECE 257A-B

ECE 258A-B

Any two quarters of ECE 259A-B-C

Group B

ECE 253A-B

ECE 254B-C

ECE 250B

ECE 256B

In addition, Plan I students must take four technical electives and Plan II students must take five. These electives must be chosen among graduate ECE, CSE, AMES, mathematics, and physics courses; ECE 159A is admissible.

#### **Comprehensive Examination**

The comprehensive examination is on upper-division undergraduate material in applied mathematics, communication theory, signal analysis, probability, and random processes.

### **ELECTRONIC CIRCUITS AND SYSTEMS**

The M.S. program in electronic circuits and systems offers interdisciplinary flexibility in the areas of research related to electronics. The fields of specialties include signal processing, VLSI design of ASICs, MIMIC design, parallel and multiprocessing, neural networks, fault-tolerant and reliable digital systems, computer-aided design, and computer-aided engineering.

#### **Course Requirements**

Two A-B-C sequences that make up the core courses (twenty-four units) must be selected from the following:

ECE 230A-B-C  
ECE 260A-B-C  
ECE 222A-B-C  
ECE 251A-B-C  
ECE 263A-B-C  
ECE 270A-B-C

Elective courses to complete the total of forty-eight units must be taken by Plan II students and forty-four units by Plan I students.

### **INTELLIGENT SYSTEMS, ROBOTICS AND CONTROL**

The M.S. program in intelligent systems, robotics and control stresses the integration of computers and mathematics for use in the analysis and control of complex, uncertain systems. Students with a good undergraduate background can complete the M.S. Plan II program in one year of full-time study.

#### **Course Requirements**

Two sequences (twenty-four units) must be selected from the following core sequences:

ECE 251 A-B-C  
ECE 271 A-B-C  
ECE 250A, ECE 272A-B  
ECE 273 A-B-C  
ECE 275, ECE 274A-B  
ECE 172A-B

In addition, Plan I students must take five technical electives and Plan II students must take six. These electives must be chosen among graduate ECE, CSE, AMES, mathematics, and physics courses. A student may select one sequence (twelve units) at the 100-level to satisfy this requirement. Specific core courses and elective courses must be approved by the graduate adviser.

#### **Comprehensive Examination**

A comprehensive examination on upper-division undergraduate areas is given in the fall and spring quarters. Students must take the section on probability/random processes and choose one additional topic from either control theory or signal processing.

Plan II students must also pass an oral exam on one of the graduate core sequences.

### **COMPUTER ENGINEERING**

The program is administered jointly with the Department of Computer Science and Engineering. The M.S. degree entails forty-eight units of work; students may elect the thesis option Plan I or comprehensive examination Plan II. Prepared students can complete the program in one year of full-time study.

#### **Course Requirements**

Core courses are required from the following three groups

- 1.) Three Software Courses:  
CSE 264B: Operating Systems  
CSE 268A or 279: Algorithms  
CSE 264C: Programming Languages
- 2.) Three Hardware Courses:  
CSE 270A: Architecture  
ECE 260A: VLSI  
and one of the following:  
ECE 251A: Digital Signal Processing  
ECE 263A: Fault-Tolerant Design  
CSE 281V: Computer-Aided Design
- 3.) Two Theory Courses:  
CSE 265B: Computation  
ECE 257A: Networks

Students in either plan must elect twelve technical units among graduate courses within the Departments of AMES, CSE, ECE, Mathematics, and Physics. The number of research technical elective units included among the sixteen varies with the department.

#### **Comprehensive Examination**

The Plan II comprehensive examination consists of two parts. In the first part, three of the five core areas covered in the CSE comprehensive examination are chosen from among the following CSE topics:

Operating Systems  
Algorithms  
Programming Languages  
Architecture  
Computation

The second part consists of one exam chosen from the following list of comprehensive exams given by the ECE department.

Applied Mathematics (ECE 105A-B-C)  
Digital Signal Processing  
Very Large-Scale Integrations

This portion of the examination covers these topics at the advanced undergraduate level. Examinations are given in the fall and spring quarters and must be taken during the first year of graduate study.

### **THE DOCTORAL PROGRAMS**

The requirements for the electrical engineering Ph.D. program include the same course requirements as for the M.S. degree and the same comprehensive examination. Students admitted to the Ph.D. program, who already hold an M.S. degree in electrical engineering, must nevertheless satisfy the requirements for the core courses. Grad-

uate courses taken elsewhere can be substituted for specific courses if approved by the appropriate ECE graduate adviser. In their second year, Ph.D. students should find a **research adviser** and devote at least half of their time to research.

Following completion of their course requirements and comprehensive exam, students in the Ph.D. program should devote themselves to full-time research (under ECE 299) and within one year they must pass a departmental **research exam**. This is an oral exam in which the student presents his or her research to a committee of three ECE faculty members.

Having satisfied the departmental graduate requirements, Ph.D. students should start to define their thesis research. Within the time limits given under regulations above, they will select a doctoral committee to which they present their proposed thesis research (called the **university qualifying exam** or **candidacy exam**). At this point they have been accepted as candidates for the Ph.D. Students who have satisfied these departmental graduate requirements may register for any ECE course on a satisfactory/unsatisfactory basis.

To complete their degree, candidates for the Ph.D. will write a **dissertation** and defend it in a final oral examination conducted by the same doctoral committee.

### **APPLIED PHYSICS**

The various fields of study were described under the "Graduate Programs in Electrical Engineering (Applied Physics)" section. The course and examination requirements are as listed for the M.S. program under "Electrical Engineering (Applied Physics)." After enrolling in the Ph.D. program, a student must obtain an ECE faculty adviser; this will either be a research adviser or the faculty adviser for applied physics for students without a research adviser. The core and elective courses must be chosen with the approval of the adviser.

### **COMMUNICATION THEORY AND SYSTEMS**

Students who do not hold the degree of M.S. in electrical engineering must pass at least five graduate courses during the first year of full-time study. Students who already hold the degree of M.S. in electrical engineering must take eight graduate courses during the first year. Upon the approval of the graduate adviser, graduate courses taken elsewhere could count towards fulfillment of this requirement.

All students admitted to study for the Ph.D. must attain a cumulative grade-point average of 3.4 in the graduate courses.

**ELECTRONIC CIRCUITS AND SYSTEMS**

After enrolling in the Ph.D. program, a student must obtain an ECE faculty adviser. The chosen core and elective courses must be approved by the adviser. The course requirements are as for the M.S. program in electrical engineering (electronic circuits and systems).

**INTELLIGENT SYSTEMS, ROBOTICS AND CONTROL**

Students who have been admitted to study for the Ph.D. degree in the intelligent systems, robotics and control program, but do not hold the degree of M.S. in electrical engineering, will be enrolled in the M.S. (Plan II) program upon entrance. Upon completion of its requirements, which must be accomplished within two years of full-time study, these students will be enrolled in the Ph.D. program.

Students admitted to study for the Ph.D. and already holding the degree of M.S. in electrical engineering will be enrolled in the Ph.D. program upon entrance. They must take the comprehensive examination in two areas (probability/random processes and either control theory or signal processing) during the first year. All students admitted to study for the Ph.D. must attain a cumulative grade-point average of 3.4 in the graduate courses.

Upon enrollment in the Ph.D. program, a student must secure a faculty adviser. Within two years after enrollment in the Ph.D. program, the student must pass an oral graduate comprehensive examination. This exam is based on four graduate sequences (forty-eight units), of which at least two must be from the core sequences (listed under the M.S. program). One of the four topics on the exam may be replaced by achieving an A in each quarter of one of the graduate sequences.

**COMPUTER ENGINEERING**

Students who have been admitted to the Ph.D. program in computer engineering, but who do not hold a M.S. degree, will be enrolled in the M.S. (Plan II) program. Upon completion of its requirements, which must be accomplished within the equivalent of full-time study of two years, these students will be enrolled in the Ph.D. program. They must pass at least five graduate courses during their first year of full-time study.

Students admitted to study for the Ph.D. who already hold a M.S. degree will be enrolled in the Ph.D. program upon admission. They must complete the Master of Science Plan II core course

requirements and take the comprehensive examination during the first year. They must pass eight graduate courses during the first year of study.

All students admitted to the Ph.D. program must maintain a cumulative grade-point average of 3.4 in the core courses.

A student must obtain a faculty adviser from either the ECE or CSE department, and as soon as fulfillment of the course requirements is well under way, the student should begin a research project.

**APPLIED OCEAN SCIENCES**

The applied ocean sciences program is an interdepartmental program administered jointly with SIO and AMES. Students should go to the SIO graduate office to obtain information on advisers and to check the requirements.

**Core Courses**

Math. 210A-B-C or AMES 294A-B-C, SIO 210A, 240, 260, 280, and one additional three-course sequence listed under "Core Courses" for electrical engineering (applied physics) or electrical engineering (communication theory and systems). Continuing enrollment in the Applied Ocean Science Seminar (SIO 208) is required.

**Comprehensive Examination**

Students are required to pass the written applied ocean science examination covering the applied ocean sciences core courses. The examination is given during the second year. Upon successful completion of the written examination, the student will be given an oral examination by an interdepartmental committee composed of two ECE faculty members and one faculty member from SIO or AMES.

**Courses**

The department will endeavor to offer the courses as outlined below; however, unforeseen circumstances sometimes mandate a change of scheduled offerings. Students are strongly advised to check the *Schedule of Classes* or the department before relying on the schedule below.

The names appearing below the course descriptions are those of faculty members in charge of the course. For the names of the instructors who will teach the course, please refer to the quarterly *Schedule of Classes*. CSE 65 and CSE 62B are interchangeable as prerequisites for other courses.

**LOWER DIVISION**

**5A. Our Natural and Artificial Environment: Atmosphere (4)**

Descriptive introduction to the basic nature of the earth's atmosphere. Its interaction with the ocean and biosphere. Chemical and thermal pollution (effects of CO<sub>2</sub>, aerosols, dust, etc.) and their climatic impact. Conventional and nonconventional energy resources and their environmental impacts. Three hours' lecture. *Prerequisite: none.* (F) A. Mendis

**5B. Our Natural and Artificial Environment: Computers (4)**

A descriptive introduction of how we create automated machines and computing systems to help us function in our environment. Topics include: the design and application of analog and digital electronic systems, the evolution of computers and how they function. Three hours' lecture. *Prerequisite: none.* (W) R. Fellman

**5C. Our Natural and Artificial Environment: The Electron (4)**

This course describes in the simplest possible terms the basic properties of electrons and how modern electronic devices used on a daily basis work. Topics will include such devices as calculators, lasers, telephone, radio, etc. Three hours' lecture. *Prerequisite: none.* (S) S.S. Lau, K. Kavanagh, or P. Yu

**10. Introduction to Scientific Programming (4)**

Introduction to digital computation and numerical methods. The UNIX operating system and FORTRAN 77. Symbol manipulation, simulation, design of subroutines, numerical solution of simple algebraic and differential equations. Special attention given to problems encountered in circuit analysis and design. Three hours' lecture. *Prerequisite: Math. 2A or equivalent (may be taken concurrently).* (W) K. Quest

**50A. Circuits and Systems (4)**

Physical behavior of circuit elements—resistance, capacitance, inductance and mutual inductance; reference directions for voltage-current relationships; Kirchhoff's voltage and current laws; source transformations; loop and node analysis; initial conditions; classical solution of systems of differential circuit equations; the Laplace transform; inverse transform; partial fraction expansions. Three hours' lecture, one hour discussion. *Prerequisites: Math. 2B and Phys. 2B or 3B (may be taken concurrently).* (F) R. Lugannani

**50B. Circuits and Systems (4)**

Solution of network equations using Laplace transforms; convolution integral; the concept of complex frequency; impedance of circuit elements; series and parallel combinations of impedances; Thevenin's and Norton's theorems; driving point and transfer functions; poles and zeroes of driving point impedances and transfer functions; two-port networks. Three hours' lecture, one hour discussion. *Prerequisites: ECE 50A and Math. 2DA (may be taken concurrently).* (W) R. Lugannani

**52AL. Elementary Measurements Laboratory I (2)**

The use of the oscilloscope, function generator, digital multimeter. Components and their ratings. Frequency characteristics of measuring instruments. Measurements of capacity and inductance. The concepts of time and frequency domains. The RC filter. Emphasis is placed on report writing. One hour discussion, three hours' laboratory. *Prerequisite: Phys. 2B or equivalent.* (F) M. Rotenberg

**52BL. Elementary Measurements Laboratory II (2)**

The LC filter. The idea of universal frequency characteristics. The Q factor. Band-pass RC filters, RLC filters and notch filters. Filter design. One hour discussion, three hours' laboratory. *Prerequisite: ECE 52AL* (W) M. Rotenberg

**80. Introduction to Computer Engineering (4)**

This course is designed to introduce the fundamentals in both the hardware and software in a computing system. Topics in-



clude the representation of information, computer organization and design, combinational and sequential logic, microprogramming, and current technology in logic designs. Three hours' lecture. *Prerequisite: none.* (FS) T.T. Lin and R. Fellman

#### 90. Undergraduate Seminar (1)

This seminar class will provide a broad review of current research topics in both electrical engineering and computer engineering. Typical subject areas are signal processing, VLSI design, electronic materials and devices, radio astronomy, communications, and optical computing. One hour lecture. *Prerequisite: none.* (F,W,S)

## UPPER DIVISION

#### 104. Numerical Methods in Electrical Engineering (4)

Introduction to applied numerical methods for solution of electrical engineering problems. Iterative solutions of nonlinear equations; matrix methods and solution of multi-loop circuit equations; filtering, smoothing, spline fits and interpolation of laboratory data; numerical differentiation and integration. Three hours' lecture, one hour discussion, three hours' lab. *Prerequisites: CSE 62A or equivalent, ECE 50A or equivalent, and knowledge of Fortran 77 recommended.* (S) K. Quest

#### 105A. Complex Variables and Transform Analysis (4)

Functions of a complex variable, integration of a function of a complex variable, singularities, and residues. Infinite series for functions of a complex variable. Z-transforms. Discrete and continuous time Fourier series and transforms. Linearity, causality and time invariance. Convolutional integral. Eigenfunctions. Transform analysis. Modulation and sampling. Three hours' lecture, one hour discussion. *Prerequisites: Math. 2A-2F, ECE 50A,B.* (F) R. Cruz

#### 105B. Introduction to Mathematical Physics (4)

Differential equations, Frobenius' method, exceptional cases, Bessel, Legendre, and hypergeometric equations and functions. Boundary value problems; the Sturm-Liouville problem, generalized Fourier series. Vector analysis: vector algebra, differentiation of vectors, the vector operator  $\nabla$ , gradient, divergence and curl operators, the theorems of Gauss, Stokes, and Green. Three hours' lecture, one hour discussion. *Prerequisite: ECE 105A.* (W) A. Mendis

#### 105C. Introduction to Mathematical Physics (4)

Topics in higher dimensional calculus: partial differentiation; implicit functions; functional dependence; Jacobians; Lagrange multipliers; calculus of variations and its applications, differentiation of integrals. Methods for solving partial differential equations: Laplace's equation, Poisson's equation, the wave equation and the Klein-Gordon equation, heat conduction and mass diffusion equations and the telegraph equation. Three hours' lecture, one hour discussion. *Prerequisite: ECE 105B.* (S) A. Mendis

#### 120. Solar System Physics (4)

General introduction to planetary bodies, the overall structure of the solar system, and space plasma physics. Course emphasis will be on the solar atmosphere, how the solar wind is produced, and its interaction with both magnetized and unmagnetized planets (and comets). Three hours' lecture. *Prerequisites: Phys. 2A,B or 4A,C and Math. 2A,B (Phys. 2C and Math. 2C recommended).* (S) K. Quest

#### 121A. Electromagnetism (4)

Electrostatics and magnetostatics. Electrodynamics. Maxwell's equations: integral and differential forms, simple plane waves, quasi-static approximations. The Poynting vector. Skin effect, the electromagnetics of circuits. Transmission lines: reflection and transmission at discontinuities, matching problems. Three hours' lecture, one hour discussion, one hour lab. *Prerequisites: Math. 2F, Phys. 2B-C (or 4C-D), ECE 105B.* (F) B. Rickett

#### 121B. Electromagnetism (4)

Lossy transmission lines, dispersion, group velocity. Plane waves, reflection and transmission at interfaces. Electromagnetic power, energy and Poynting's theorem. Boundary value problems. Guided waves: TEM, TE and TM modes, coaxial lines, microstrip, waveguides, optical fibers. Resonant structures, Q-factor. Transmission line circuits. Coupled lines. Three hours' lecture, one hour discussion, one hour lab. *Prerequisite: ECE 121A.* (W) B. Rickett

#### 121C. Electromagnetism (4)

The magnetic vector potential, electric dipole radiation, duality, magnetic dipole. Spherical harmonics. Far field radiation from electric and magnetic sources. Antenna gain and radiation patterns, reciprocity, antennas in reception, polarization. Diffraction, slots, horns. Antenna arrays, self and mutual impedances. Numerical methods for antennas. Three hours' lecture, one hour discussion, one hour lab. *Prerequisite: ECE 121B.* (S) B. Rickett

#### 122. Electromagnetic Wave Propagation (4)

Transmission lines, impedance matching, attenuation, and dispersion. Electromagnetic fields, Maxwell's equations, plane waves. Dielectric guides, optical fibers. Radiation and antennas. Students may not receive credit for both ECE 121B and ECE 122. Three hours' lecture, one hour discussion. *Prerequisites: Math. 2F, Phys. 2B-C (or 4C-D), ECE 50A-B, ECE 105A.* (S) B. Rickett

#### 133. Structure of Solids (4)

Atomic structure, properties and growth of ordered and disordered solids. Laboratory work includes generation of X-ray spectra, symmetry determination by Laue-technique, structure determination by single crystal and powder techniques, electron diffraction and radial distribution analysis. Four hours' lecture. *Prerequisite: consent of instructor.* (See also "Materials Science Program" section.) (Offering depends on enrollment; check with department.) Staff

#### 134. Electronic Materials Science of Integrated Circuits (4)

Electronic materials science with emphasis on topics pertinent to microelectronics and VLSI technology. Concept of the course is to use components in integrated circuits to discuss structure, thermodynamics, reaction kinetics, and electrical properties of materials. Three hours' lecture. *Prerequisites: Phys. 2C and 2D.* (S) K. Kavanagh

#### 135A. Semiconductor Physics (4)

Review of quantum theory, crystalline lattices, band theory of solids, electron statistics, carrier motion in semiconductors, junction theory, semiconductor devices related to p-n junction diodes. Three hours' lecture. *Prerequisites: Phys. 2D or 4E and ECE 105A concurrently.* (F) H-L. Luo

#### 135B. Transistor Physics (4)

Physics of semiconductor devices, mainly bipolar junction transistors (BJT), field-effect transistors (FET), and metal-oxide-semiconductor transistors (MOS). Discussion of general characteristic equations, device parameters, and various models. Three hours' lecture. *Prerequisite: ECE 135A.* (W) C. Tu

#### 136A. Fundamentals of Semiconductor Device Fabrication (4)

Crystal growth, controlled diffusion, determination of junction depth and impurity profile, epitaxy, oxidation, and photolithography techniques, monolithic process. Three hours' lecture. *Prerequisites: ECE 135A-B or equivalent.* (F) W. Chang or P. Yu

#### 136B. Microelectronics Laboratory (4)

This course is designed to provide laboratory training for students who are interested in the fabrication of semiconductor devices. Lectures will be combined with laboratory to cover photolithography, oxidation, diffusion, thin film deposition,

etching and evaluation of devices such as diodes, bipolar transistors, and field effect transistors. *Prerequisites: ECE 135A-B; 136A recommended.* (F,W,S) W. Chang or S.S. Lau

#### 136C. Optoelectronic Circuit Design Laboratory (4)

Design, fabrication, and evaluation of optoelectronic circuits, involving optical and electronic devices as well as optical fiber and microwave transmission lines. Lectures will be combined with laboratory to cover the basic operating principles of circuit element and system requirements. Two hours' lecture, six hours' laboratory. *Prerequisites: ECE 135A-B and ECE 121B.* (F) P. Yu and W. Chang

#### 137. Materials Laboratory (4)

A laboratory course covering experimental concepts and approaches in the study of materials, including preparation, processing, alloying, crystal growing, physical metallurgy, and various techniques in the evaluation and characterization of materials. One hour lecture, four to six hours' laboratory. *Prerequisite: some background in solid-state physics or consent of instructor.* (S) H-L. Luo

#### 139. Semiconductor Device Modeling and Design (4)

Device physics of modern FET and bipolar transistors, including behavior of submicron structures. Integrated circuit fabrication. Relationship between structure and circuit models of transistors. CMOS and BiCMOS circuits. Emphasis on computer simulation of transistor fabrication, operation, and application in integrated circuits. Three hours' lecture. *Prerequisites: ECE 135A,B and ECE 160A.* (S) P. Asbeck

#### 140A. Quantum Electronics (4)

Introduction to quantum electronics, based on quantum mechanics. Interaction of optical radiation with atomic systems. Applications to light sources (lasers, light-emitting diodes), photodetectors, periodic media. Three hours' lecture. *Prerequisites: Math. 2DA, Phys. 2C and 2D (or 4C, 4D, and 4E).* (F) C. Tu, S. Esener, and P. Yu

#### 140B. Optical Engineering I (4)

Fourier optics. Two-dimensional Fourier transforms and angular spectrum of plane waves. Fresnel transform and spherical waves. Elements of information processing using coherent and incoherent light. Optical and computer-generated holography. Diffractive optics. Three hours' lecture. *Prerequisites: ECE 140A, ECE 105A; concurrent registration in ECE 105B recommended.* (W) S. Lee and S. Fainman

#### 140C. Optical Engineering II (4)

Geometrical optics. Ray tracing. Electro-optic and acousto-optic modulation and scanning. Holographic scanners. Computer-aided design of optical systems. Three hours' lecture. *Prerequisites: ECE 140A,B; concurrent registration in ECE 105C recommended.* (S) C. Guest

#### 141A. Lasers and Holography (4)

Lenless holograms, multiple beam holograms, bleached holograms, computer-generated binary holograms, color holograms. Laser principles. Solid-state laser, liquid (or dye) lasers, gas lasers. Laser resonator designs. Laser parameter measurements. Two hours' lecture, six hours' laboratory. *Prerequisites: ECE 140A-B-C or consent of instructor.* (F) S. Lee and C. Guest

#### 141B. Optical Signal Processing (4)

Optical transformation with various lens systems. Design of a Fourier spectrum analyzer. Imaging and information processing with coherent and incoherent illuminations. Partial coherence, impulse response, and transfer function concepts. Optical spatial filtering and spatial filter synthesis. Production of optical components such as a lens or a spherical mirror. Two hours' lecture, six hours' laboratory. *Prerequisites: ECE 140A-B-C or consent of instructor.* (W) S. Fainman and S. Lee

#### 141C. Optical Electronics and Communications (4)

Principles and performance characteristics of important devices and components in optical electronics and communication sys-



tems, which include light sources (laser and light-emitting diodes), modulators (electro-optic and acousto-optic), waveguides or transmission media for light (fibers and integrated optical guides), and optical detectors. Engineering design considerations for optical electronic circuits and optical communication systems. Two hours' lecture, six hours' laboratory. *Prerequisites: ECE 140A-B-C or consent of instructor.* (S) C. Guest and S. Esener

**144A. Introduction to Robotic Vision**

Visual perception, imaging geometry, camera model and calibration. Image processing fundamentals: image transforms, image enhancement using spatial- and frequency-domain methods, filtering and restoration. Introduction to photometric stereo, motion fields, and elements of pattern classification. Three hours' lecture. *Prerequisites: ECE 170A, 105A, and some computer programming experience.* (S) S. Fainman

**145AL-BL-CL. Acoustics Laboratory (4-4-4)**

Automated laboratory based on H-P GPIB controlled instruments. Software controlled data collection and analysis. Vibrations and waves in strings and bars of electromechanical systems and transducers. Transmissions, reflection and scattering of sound waves in air and water. Aural and visual detection. Two hours' lecture. *Prerequisites: concurrent enrollment in ECE 121A or consent of instructor.* (F-W-S) W. Hodgkiss

**146. Fundamentals of Magnetic Recording (4)**

Basic theoretical concepts of the magnetic recording process. Magnetostatic fields from magnetized media and heads; overview of magnetic hysteresis. Playback process for single and multiple transitions. Reciprocity theorem. Record process modeling. Equivalent circuit techniques and head design. Medium noise mechanisms; signal to noise ratios and system error rate analysis. Three hours' lecture. *Prerequisites: ECE 105A,B and 121A.* (W) N. Bertram

**147. Magnetic Recording Laboratory (4)**

Basic measurements in magnetic recording. FFT spectral analysis. The use of measurements and the theory from ECE 146 to investigate magnetization processes in heads and magnetic media. Topics include: fields and Fourier transforms of head structures; inductance and B-H loop of recording heads and head core materials; recording system calibration. One hour lecture, seven hours' lab. *Prerequisites: ECE 146 and laboratory experience.* (S) N. Bertram

**152A. Probability and Random Processes for Engineers (4)**

Introduction to probability theory. Random variables, conditional and unconditional distribution functions, characteristic functions, moments, transformation of random variables. Sequences of random variables. *Prerequisite: ECE 105A concurrently.* (F) R. Rao

**152B. Probability and Random Processes for Engineers (4)**

Random processes. Stationary processes: correlation, power spectral density. Gaussian processes and linear transformation of Gaussian processes. Point processes. Random noise in linear systems. *Prerequisite: ECE 152A.* (F) R. Rao

**152C. Kalman and Wiener Filtering (4)**

Minimum and linear mean square estimators and their properties, orthogonality principle, design and experiments (computer simulations) with linear estimators, discrete time Kalman filters (KF), and applications, steady state KF, design and experiments with KF, KF based on continuous time state and discrete measurement model, continuous time KF, Weiner filtering and relationship to KF. *Prerequisites: admission to the major and grade of C or better in ECE 152A and B.* (S) B. Rao

**154A. Communications Systems (4)**

Review of stochastic processes including correlation functions and power spectral densities. Orthogonality principle and optimum linear mean-square estimation, including solution of

Wiener-Hopf equation. Description of analog modulation systems including AM, SSB, DSB, VSB, FM, and PM. *Prerequisites: ECE 152A-B.* (F) L. Milstein

**154B. Communications Systems (4)**

Analysis of analog modulation systems in the presence of noise, including both coherent and noncoherent demodulation and including threshold effects in FM. Analysis of performance of digital modulation techniques, including probability of error results for PSK, DPSK, and FSK. Introduction to effects of intersymbol interference and fading. *Prerequisite: ECE 154A.* (W) L. Milstein

**154C. Communications Systems (4)**

Detection and estimation theory including optimal receiver design and maximum-likelihood parameter estimation. Introduction to information theory and coding, including entropy, average mutual information, channel capacity, and block codes. *Prerequisite: ECE 154B.* (S) L. Milstein

**154AL. Communications Systems Laboratory (2)**

This course will be concerned with modulation and coding techniques for digital recording channels. Two hours' seminar. *Prerequisite: concurrent registration in ECE 154A.* (F) J. Wolf

**154BL, CL. Communications Systems Laboratory (4)**

This course will be concerned with modulation and coding techniques for digital recording channels. In the winter and spring quarters students will perform experiments and/or computer simulations. One hour lecture, four hours' laboratory. *Prerequisite: concurrent registration in ECE 154B and C required.* (W,S) J. Wolf

**158A. Data Networks (4)**

Layered network architectures, data link control protocols and multiple-access systems, performance analysis. Flow control; prevention of deadlock and throughput degradation. Routing, centralized and decentralized schemes, static, dynamic algorithms. Shortest path and minimum average delay algorithms. Comparisons. Three hours' lecture, three hours' lab. *Prerequisites: ECE 152A, B or equivalent, ECE 159A.* (W) R. Rao

**158B. Data Networks (4)**

Layered network architectures, data link control protocols and multiple-access systems, performance analysis. Flow control; prevention of deadlock and throughput degradation. Routing, centralized and decentralized schemes, static, dynamic algorithms. Shortest path and minimum average delay algorithms. Comparisons. Three hours' lecture, three hours' lab. *Prerequisite: ECE 158A.* (S) R. Cruz

**159A. Queuing Systems (4)**

Analysis of single- and multi-server queuing systems; queue size and waiting lines. Modeling of telephone systems, interactive computer systems and the machine repair problems. Three hours' lecture. *Prerequisite: ECE 152B or Math. 180A.* (F) E. Masry

**159B. Queuing Systems (4)**

Queues in tandem. Priority scheduling, computer systems application; time-sharing scheduling, modeling and performance of interactive multiprogrammed computer systems. Three hours' lecture. *Prerequisite: ECE 159A.* (W) E. Masry

**159C. Queuing Systems (4)**

Computer systems modeling: a case study. Elements of computer-communication networks; delay analysis, capacity and flow assignments, random access techniques. Operation research applications, cost models and optimization, a case study, introduction to inventory systems. Three hours' lecture. *Prerequisite: ECE 159B.* (S) E. Masry

**160A. Electronic Circuits and Systems I (4)**

Nonlinear active circuit design. Nonlinear device models for diodes, bipolar and field-effect transistors. Large signal analyses of circuits such as digital inverters, current sources, and

buffers. Linearization of device models and small signal equivalent circuits. Biasing and small signal models for circuits such as common emitter stages and emitter-coupled pairs. Dynamic response of digital circuits, bandwidth of analog circuits. Circuit designs will be simulated by computer and tested in the laboratory. Three hours' lecture, one hour discussion, three hours' lab. *Prerequisites: ECE 50A,B, ECE 170A, ECE 52AL,BL, ECE 175B.* (F) W. Coles

**160B. Electronic Circuits and Systems II (4)**

Analysis and design of digital integrated electronic circuits and subsystems for LSI and VLSI Systems. Analytical methods for obtaining static and dynamic characteristics will be stressed. Application of MOS field-effect transistors and bipolar junction transistors to circuits such as combinational logic gates, regenerative logic circuits (flip-flops; Schmidt-triggers, mono and astable multivibrators), datapaths (shift registers, FIFOs, STACKS), programmable logic arrays, memory elements (RAMs, ROMs, EPROMs, CAMs). GaAs devices and circuits will be introduced. Circuits will be simulated by computer and tested in lab. Three hours' lecture, one hour discussion, three hours' lab. *Prerequisites: ECE 170A, 175B, ECE 80 (or CSE 70), ECE 160A.* (W) S. Esener

**160C. Electronic Circuits and Systems III (4)**

Analysis and design of analog electronic circuits and systems. Ideal and practical operational amplifiers and circuits. Feedback systems, applications to operational amplifier circuits. Stability, sensitivity, bandwidth, compensation. Design of active filters, state-variable realizations, Sallen-Key realizations, multiple-feedback infinite-gain realizations. Switched capacitor circuits. Phase-locked loops. Analog-to-digital and digital-to-analog conversion. Circuit designs will be simulated by computer and tested in the laboratory. Three hours' lecture, one hour discussion, three hours' lab. *Prerequisites: ECE 160A, 171A.* (S) W. Coles

**161A. Analog Integrated Circuit Design (4)**

Design of linear and nonlinear analog integrated circuits in bipolar and MOS technologies. Linear circuits include video amplifiers, operational amplifiers, voltage regulators, drivers, and power stages. Nonlinear circuits include oscillators and multipliers. Use of feedback at the circuit level. Effects of circuit design on noise performance. Parasitic effects and limitations in integrated circuit design. In addition, basic A/D and D/A converters will be discussed. Circuit designs will be simulated by computer and tested in the laboratory. Three hours' lecture, one hour discussion, three hours' lab. *Prerequisites: ECE 160C, 171A. Recommended: ECE 135A, 152B.* (F) R. Fellman

**161B. Digital Integrated Circuit Design (4)**

Advanced circuits and subsystems for MOS LSI and VLSI Digital Systems Design. Advanced circuit characterization and performance estimation and optimization. Impact of technology scaling. Circuit design for alternative logic styles (static, dynamic, pass transistor, domino, clocked) and alternative clocking schemes (synchronous mono, 2/4/multiphase, asynchronous). Subsystem design include arithmetic (adders, comparators, multipliers), ALUs and counters, memory systems, regular iterative arrays, and PLAs. Introduction to VLSI design techniques for gate arrays, PLDs, standard cell and custom design. Subsystems will be designed and simulated using CAD tools. Cross-listed with CSE 172A. Three hours' lecture, one hour recitation, and three hours' lab. *Prerequisites: ECE 160B or CSE 170A,B.* (W) P. Chau

**161C. Microwave Systems and Circuits (4)**

Waves, distributed circuits and scattering matrix methods. Detection and frequency conversion using microwave diodes. Design of transistor amplifiers including noise performance. Analysis of simple antenna systems. Circuit designs will be simulated by computer and tested in the laboratory. Three hours' lecture, one hour discussion, three hours' lab. *Prerequisites: ECE 121A-B, ECE 160A.* (S) W. Coles

**162A. Electronic Signal Processing I (4)**

Design of linear filters in continuous and discrete time. Approximation of specifications by rational functions. Mapping low-pass prototypes to high-pass, band-pass, etc. Sensitivity analysis. Design of digital FIR, IIR, and frequency domain filters. Digital correlation and convolution (linear and cyclic). Finite word length effects and limit cycles. Decimation and interpolation. Fast Fourier transform (FFT) algorithms. Structures for discrete time system implementation. Algorithms will be simulated by computer and tested in laboratory. Three hours' lecture, one hour discussion, three hours' lab. *Prerequisites:* ECE 160A,B,C. (W) R. Fellman

**162B. Electronic Signal Processing II (4)**

Basic principles of adaptive algorithms. Algorithms for adaptive FIR (search techniques, gradient and LMS, recursive techniques, RLS and fast RLS) and IIR (gradient descent, SPR, ARMAX) filtering. Adaptive algorithms for restoring signal properties. Implementation issues. Introduction to advanced fast transform algorithms (FFT, Winograd FFT, number theoretic transforms, DCT). Fast convolution and correlation. Basic concepts of abstract algebra and number theory will be studied, as well as computations in surrogate fields. Algorithms and architectures will be simulated by computer lab. Three hours' lecture, one hour discussion, three hours' lab. *Prerequisites:* ECE 162A, ECE 152A,B,C. (S) P. Chau

**167. Data Acquisition and Process Control (4)**

Introduction to the design of microprocessor-based systems. Analysis of microprocessor architecture and functionality. Design of data acquisition and control systems. Memory mapped and DMA based I/O, interrupt driven systems, I/O standards, buses, and communications protocols will be discussed. Three hours' lecture, four hours' lab. *Prerequisites:* ECE 160B, ECE 170A, 175B, (80 or CSE 70). (F) C. Guest and P. Chau

**169. Concurrency and Real-Time Systems (4)**

Advanced issues in microprocessor-based system design. Timing, synchronization, and concurrency in the hardware and software of digital systems. Interrupt driven systems; synchronous and asynchronous systems; hardware and software interaction and concurrent programming. Three hours' lecture, four hours' lab. *Prerequisites:* ECE 170A, ECE 80, or CSE 70. (W) T.T. Lin and R. Fellman

**170A. Digital Systems (4)**

Design of digital electronic systems. Topics include Boolean algebra, logic minimization, combinational and sequential logic design. Circuits to be discussed include logic gates, flip-flops, registers, and counters. Three hours' lecture, one hour discussion. *Prerequisites:* ECE 50B, ECE 80 or CSE 70 (may be taken concurrently), ECE 175B (must be taken concurrently). (S) C. Guest

**171A. Linear Control System Theory (4)**

Stability of continuous- and discrete-time single-input/single-output linear time-invariant control systems emphasizing frequency domain (s- and z-plane) methods. Transient and steady-state behavior. Stability analysis by root locus, Bode, and Nyquist plots. Design of compensators. Introduction to the state-variable formulation of the control problem for the linear time-invariant systems. Three hours' lecture, one hour discussion. *Prerequisites:* ECE 50A,B, ECE 105A. (W) A. Sebald

**171B. Linear Control System Theory (4)**

Time-domain, state-variable formulation of the control problem for both discrete-time and continuous-time linear systems. State-space realizations from transfer function system description. Internal and input-output stability, controllability/observability, minimal realizations, and pole-placement by full-state feedback. Three hours' lecture, one hour discussion. *Prerequisite:* ECE 171A. (S) A. Sebald

**172A. Introduction to Robotics: Kinematics and Dynamics (4)**

Kinematics of rigid bodies and serial-chain manipulators. The forward and inverse kinematics problem. Sufficient conditions

for exact solvability of the inverse kinematics problem. Joint-space versus task-space control. Path/trajectory generation. Newton-Euler and Lagrangian formulations of manipulator dynamics. Three hours' lecture, one hour discussion. *Prerequisites:* ECE 171A,B. (F) K. Kreutz-Delgado

**172B. Introduction to Robotics: Control of Redundant and Nonredundant Manipulators (4)**

Manipulability measures. Redundancy resolution by subtask functional optimization and side-constraint satisfaction. Pseudo-inverse kinematic control of redundant manipulators. PID and feedback-linearizing trajectory and force control. Issues in path-planning and compliant assembly. Three hours' lecture, one hour discussion. *Prerequisites:* ECE 172A, ECE 176A. (W) K. Kreutz-Delgado

**173. Theory and Applications of Neural Networks and Fuzzy Logic (4)**

Theory of fuzzy logic, reasoning and control; mathematical aspects of neural architectures for pattern classification, functional approximation, and adaptive estimation and control; theory of computer-assisted learning (supervised, unsupervised and hybrid); theory and practice of recurrent networks (stability, placement of equilibria); computer-aided design of fuzzy and neural systems, Bayes and minimax design. Four hours' lecture. *Prerequisite:* Math. 2EA. (Summer) A. Sebald

**175B. Digital Hardware Laboratory (2)**

Design, implementation, and testing of digital electronic systems using SSI and MSI logic blocks. One hour discussion, three hours' laboratory. *Prerequisites:* ECE 52BL, ECE 170A (may be taken concurrently). (S) M. Rotenberg

**176A-B-C. Introduction to Optimization and Applications (4-4-4)**

Unconstrained optimization. Constrained and discrete optimization. Linear and nonlinear programming. Kuhn-Tucker conditions. Simplex method. Design of effective computational procedures for solving optimization problems. Optimal control problems; design of linear quadratic-optimal controllers, dynamic programming, maximum principle, calculus of variations, two-point boundary value problems. Three hours' lecture. *Prerequisites:* admission to the major and grades of C or better in Math. 2EA. ECE 176B requires a C or better in 176A. ECE 176C requires ECE 171A-B and 176B. (F) D. Sworder

**177. Microprocessor Real-Time Control Laboratory (4)**

Project-based design course in which a microprocessor controls a dynamic electromechanical device in real time (including sensing, software, and actuation). Groups or pairs of students propose, design, build and debug project, which must function in real time by the last day of instruction. Involves fifteen hours per week in laboratory (twenty-four hour access for enrolled students). (Priority enrollment is given to robotics and control majors.) *Prerequisites:* admission to the major and grades of C or better in ECE 171A and concurrent enrollment in ECE 171B. (S) A. Sebald

**195. Teaching (2 or 4)**

Teaching and tutorial activities associated with courses and seminars. Not more than four units of ECE 195 may be used for satisfying graduation requirements. (P/NP grades only.) Three hours' lecture. *Prerequisite:* consent of the department chair.

**197. Field Study in Electrical and Computer Engineering (4, 8, 12, or 16)**

Directed study and research at laboratories and observatories away from the campus. (P/NP grades only.) *Prerequisites:* consent of instructor and approval of the department.

**198. Directed Group Study (2 or 4)**

Topics in electrical and computer engineering whose study involves reading and discussion by a small group of students under direction of a faculty member. (P/NP grades only.) *Prerequisite:* consent of instructor.

**199. Independent Study for Undergraduates (2 or 4)**

Independent reading or research by special arrangement with a faculty member. (P/NP grades only.) *Prerequisite:* consent of instructor.

GRADUATE

**220. Space Plasma Physics (4)**

The nature of the solar wind interaction with different planets and comets leads to a variety of magnetospheres. This course will deal with both nature of the solar wind as well as these interactions. Three hours' lecture. *Prerequisites:* ECE 131A-B-C or consent of instructor. (W) A. Mendis

**222A,B,C. Applied Electromagnetic Theory (4)**

Electrostatics and dielectric materials. Uniqueness, reciprocity, and Poynting theorems. Solutions to Maxwell's equations in rectangular, cylindrical, and spherical coordinates. Waves in isotropic and anisotropic media, transmission lines, waveguides, optical fibers, and resonant structures. Radiation, propagation, and scattering problems. Scattering matrices, microwave circuits, and antennas. Three hours' lecture. *Prerequisites:* ECE 121A,B,C or equivalent. (F,W,S) B. Rickett

**224A,B. Wave Propagation through Random Media (4)**

Theory of scintillations due to refractive-index fluctuations at radio wavelengths in the solar wind, the ionosphere, and the interplanetary medium, and at optical wavelengths in the earth's atmosphere. Connection between the refractive index spectrum, the angular spectrum, and the intensity spectrum. Three hours' lecture. *Prerequisite:* consent of instructor. (W,S) W. Coles

**230A. Solid State Electronics (4)**

This course is designed to provide a general background in solid state electronic materials and devices. Course content emphasizes the fundamental and current issues of semiconductor physics related to the ECE solid state electronics sequences. Three hours' lecture. *Prerequisites:* fundamentals of quantum mechanics, ECE 135A-B, or equivalent. (F) S.S. Lau

**230B. Solid State Electronics (4)**

The physical models for the bipolar junction transistor, the junction field-effect transistor, the metal-oxide-semiconductor (MOS) diode, and the MOS field-effect transistor are developed. Models for the behavior of these devices in circuits are also developed. Three hours' lecture. *Prerequisites:* ECE 230A. (W) P. Asbeck

**230C. Solid State Electronics (4)**

This course is designed to provide a treatise of semiconductor devices based on solid state phenomena. Band structures carrier scattering and recombination processes and their influence on transport properties will be emphasized. Three hours' lecture. *Prerequisites:* ECE 230A or equivalent. (S) P. Yu

**230D. Characterization of Electronic Devices (4)**

Characterization of the electrical and galvanomagnetic properties of semiconductors relevant to the technology of transistors and integrated circuits. Three hours' lecture. *Prerequisites:* consent of instructor. (F) H. Wieder

**230E. Introduction to Superconductivity (4)**

Superconductivity phenomenon, two-fluid models and phenomenological theories, magnetic properties of ideal superconductors, type II superconductors, tunneling, microscopic theory, superconducting materials, current developments. Three hours' lecture. *Prerequisites:* consent of instructor. (F) H-L. Luo

**231. Thin Film Phenomena (4)**

This course is designed to provide a general survey of thin film processes pertinent to microelectronics. Topics to be discussed include preparation methods, various modern analytical techniques, physical properties, growth morphology, interface reaction, and alloy formation and applications. Three hours' lecture. *Prerequisites:* consent of instructor. (W) S.S. Lau and H-L. Luo

**232. The Field Effect and Field Effect Transistors (4)**  
Physics of the field effect of elemental and III-V compound semiconductors related to the technology and characteristics of Schottky barrier gate, insulated gate, and junction gate field effect transistors. Three hours' lecture. *Prerequisite: consent of instructor.* (S) H. Wieder

**233. Structure of Solids (4)**  
Atomic structure, properties and growth of ordered and disordered solids. Laboratory work includes generation of X-ray spectra, symmetry determination by Laue-technique, structure determination by single crystal and powder techniques, electron diffraction, and radial distribution analysis. (W) G. Arrhenius

**235. Transmission Electron Microscopy (4)**  
Lectures and laboratory experience giving an introduction to transmission electron microscopy (TEM) for materials science. The course will cover the basic theory of electron optics, kinematical and dynamical diffraction, and image contrast, and will include instruction on the operation and calibration of the TEM and techniques for specimen preparation. Multiple listing with Materials Science 240D. Three hours' lecture. *Prerequisite: consent of instructor.* (W) K. Kavanagh and M. L. Rudee

**236A. Semiconductor Heterostructure Materials (4)**  
This course covers the growth, characterization, and heterojunction properties of III-IV compound semiconductors and group-IV semiconductor heterostructures for the subsequent courses on electronic and photonic device applications. Topics include epitaxial growth techniques, electrical properties of heterojunctions, transport and optical properties of quantum wells and superlattices. Three hours' lecture. *Prerequisites: ECE 230A, B, C or consent of instructor.* (F) C. Tu

**236B. Optical Processes in Semiconductors (4)**  
Absorption and emission of radiation in semiconductors. Radiative transition and nonradiative recombination. Ultra-fast optical phenomena. Laser and photodetector devices will be emphasized. Three hours' lecture. *Prerequisites: ECE 230A and 230C or equivalent.* (W) P. Yu

**236C. Heterojunction Field Effect Transistors (4)**  
Device physics and applications of isotype and anisotype heterojunctions and quantum wells, including band-edge discontinuities, band bending and space charge layers at heterojunction interfaces, charge transport normal and parallel to such interfaces, two-dimensional electron gas structures, modulation doping, heterojunction and insulated gate field effect transistors. Three hours' lecture. *Prerequisite: consent of instructor.* (S) H. Wieder

**236D. Heterojunction Bipolar Transistors (4)**  
Current flow and charge storage in bipolar transistors. Use of heterojunctions to improve bipolar structures. Transient electron velocity overshoot. Simulation of device characteristics. Circuit models of HBTs. Requirements for high-speed circuit applications. Elements of bipolar process technology, with emphasis on III-V materials. Three hours' lecture. *Prerequisite: consent of instructor.* (F) P. Asbeck

**237. Modern Materials Analysis (4)**  
Analysis of the near surface of materials via ion, electron, and x-ray spectroscopies. Topics to be covered include particle solid interactions. Rutherford backscattering, secondary ion mass spectroscopy, electron energy loss spectroscopy, particle induced x-ray emission, Auger electron spectroscopy, extended z-ray absorption, fine structure and channeling. Three hours' lecture. *Prerequisite: consent of instructor.* (F) K. Kavanagh

**238A. Thermodynamics of Solids (4)**  
The thermodynamics and statistical mechanics of solids. Basic concepts, equilibrium properties of alloy systems, thermodynamic information from phase diagrams, surfaces and interfaces, crystalline defects. Multiple listed with Materials Science 201A. Three hours' lecture. *Prerequisite: consent of instructor.* (F) K. Kavanagh

**238B. Solid State Diffusion and Reaction Kinetics (4)**  
Thermally activated processes. Boltzmann factor, homogeneous and heterogeneous reactions, solid state diffusion, Fick's law, diffusion mechanisms, Kirkendall effects, Boltzmann-Manato analysis, high diffusivity paths. Multiple listed with Materials Science 201B. Three hours' lecture. *Prerequisite: ECE 238A.* (W) K. Kavanagh

**240A. Lasers and Optics (4)**  
Fresnel and Fraunhofer diffraction theory. Optical resonators, interferometry. Gaussian beam propagation and transformation. Laser oscillation and amplification, Q-switching and mode locking of lasers, some specific laser systems. Three hours' lecture. *Prerequisites: ECE 121A, B or equivalent; introductory quantum mechanics.* (F) W. Chang

**240B. Optical Information Processing (4)**  
Space-bandwidth product, superresolution, space-variant optical system, partial coherence, image processing with coherent and incoherent light, processing with feedback, real-time light modulators for hybrid processing, nonlinear processing. Optical computing and other applications. Three hours' lecture. *Prerequisites: ECE 140B or equivalent.* (W) S. Lee and S. Fainman

**240C. Optical Modulation and Detection (4)**  
Propagation of waves and rays in anisotropic media. Electro-optical switching and modulation. Acousto-optical deflection and modulation. Detection theory. Heterodyne detection, incoherent and coherent detection. Three hours' lecture. *Prerequisites: ECE 140A, C or equivalent.* (S) S. Esener and P. Yu

**241A. Nonlinear Optics (4)**  
Second harmonic generation (color conversion), parametric amplification and oscillation, photorefractive effects and four-wave mixing, optical bistability; applications. Three hours' lecture. *Prerequisites: ECE 240A, C, or consent of instructor.* (F) S. Fainman and S. Lee

**241B. Optical Devices for Computing. (4)**  
Application of electro-optic, magneto-optic, acousto-optic, and electro-absorption effects to the design of photonic devices with emphasis on spatial light modulation and optical storage techniques. Three hours' lecture. *Prerequisites: ECE 240A, C, or consent of instructor.* (F) S. Esener

**241C. Holographic Optical Elements (4)**  
Fresnel, Fraunhofer, and Fourier holography. Analysis of thin and volume holograms, reflection and transmission holograms, color and polarization holograms. Optically recorded and computer-generated holography. Applications to information storage, optical interconnects, 2-D and 3-D display, pattern recognition, and image processing. Three hours' lecture. *Prerequisites: ECE 141A, B, or equivalent.* (W) S. Fainman

**242A. Optical Systems (4)**  
Principles of optical system design. Modeling of optical and opto-electronic components, modules, and systems. Signal integrity analysis. Design optimization using CAD. Assembly and testing. System scalability and manufacturability. Opto-electronic packaging. Three hours' lecture. *Prerequisites: ECE 240A, B, C, or consent of instructor.* (W) S. Lee

**242B. Optical Systems (4)**  
Principles of optical system design. Modeling of optical and opto-electronic components, modules, and systems. Signal integrity analysis. Design optimization using CAD. Assembly and testing. System scalability and manufacturability. Opto-electronic packaging. Three hours' lecture. *Prerequisites: ECE 240A, B, C, or consent of instructor.* (S) S. Lee

**243A. Optical Fiber Communication (4)**  
Optical fibers, waveguides, laser communication system. Modulation and demodulation; detection processes and communication receivers. Three hours' lecture. *Prerequisites: ECE 121A, B, C or equivalent; introduction to communication.* (S) W. Chang and P. Yu

**245A. Advanced Acoustics I (4)**  
Boundary value problems in vibrating systems, wave propagation in strings, bars, and plates. Fundamentals of acoustical transducers. Three hours' lecture. *Prerequisite: concurrent registration in ECE 142AL recommended.* (F) W. Hodgkiss

**245B. Advanced Acoustics II (4)**  
Theory of radiation transmission and scattering of sound with special application to ocean acoustics. Three hours' lecture. *Prerequisite: ECE 245A or consent of instructor. Concurrent registration in ECE 142BL recommended.* (W) W. Hodgkiss

**245C. Advanced Acoustics III (4)**  
Signal processing in underwater acoustics. Theory and hardware embodiments. Three hours' lecture. *Prerequisites: ECE 245B or consent of instructor. Concurrent registration in ECE 142CL recommended.* (S) W. Hodgkiss

**246A. Physics of Magnetic Recording Materials (4)**  
Properties of magnetic materials utilized as magnetic recording media and heads; magnetic structure of oxides and metals; fine particle magnetism: micromagnetic analysis; hysteresis and reversal mechanisms of hard materials; dynamic processes and domain patterns of soft materials; thermal fluctuations; multilayer phenomena: giant magnetoresistance. *Prerequisites: undergraduate electromagnetism and solid state physics or consent of instructor.* (F-alternate years) N. Bertram

**246B. Analysis of the Magnetic Recording Process (4)**  
In-depth analysis of the magnetic recording process. Magnetic fields and Fourier transforms of fields and magnetized media and heads; playback process for single and multiple transitions. Reciprocity theorem for inductive and magnetoresistive heads; record process modeling; interferences and nonlinearities; medium noise mechanisms and correlations; signal to noise ratios. *Prerequisites: undergraduate electromagnetic theory and mathematical methods or consent of instructor.* (W-alternate years) N. Bertram

**246C. Magnetic Recording Laboratory (4)**  
Basic measurements in magnetic recording. Fields and Fourier transforms of head structures using resistance paper measurements and computer analysis; inductance and B-H loop measurements of recording heads and core materials; recording system calibration and magnetization pattern investigation utilizing spectral measurements (FFT). *Prerequisites: ECE 246B and laboratory experience.* (S-alternate years) N. Bertram

**250A. Random Processes (4)**  
Random variables, probability distributions and densities, characteristic functions. Convergence in probability and in quadratic mean, Stochastic processes, stationarity. Processes with orthogonal and independent increments. Power spectrum and power spectral density. Stochastic integrals and derivatives. Spectral representation of wide sense stationary processes, harmonizable processes, moving average representations. *Prerequisite: ECE 152C or equivalent or consent of instructor.* (F) R. Lugannani

**250B. Random Processes (4)**  
Convergence of sequences of distribution functions and characteristic functions, compact and weak convergence. Central limit theorem, Liapunov and Lindeberg-Lévy theorem, infinitely divisible limit laws. Shot noise processes and generalized shot noise. Chernoff bound, Edgeworth series, saddle point expansions for probability distributions and densities. *Prerequisite: ECE 250A or consent of instructor.* (S) R. Lugannani

**251A. Digital Signal Processing I (4)**  
Sampling theorem: A/D and D/A conversion; discrete linear system theory, z-transforms; digital filters, recursive and non-recursive designs; fast Fourier transform, windowing, high-speed correlation and convolution; cepstrum analysis and homomorphic deconvolution. *Prerequisites: ECE 152A-B-C or equivalent.* (F) W. Hodgkiss and B. Rao



**251B. Digital Signal Processing II (4)**

Discrete random signals; finite word length effects; conventional (FFT-based) spectral estimation; coherence and transfer function estimation; model-based spectral estimation; applications. *Prerequisite:* ECE 251A or consent of instructor. (W) W. Hodgkiss and B. Rao

**251C. Digital Signal Processing III (4)**

Single and multichannel data processing in a time-varying environment; phase locked loops; Kalman filters; adaptive transversal and lattice filters; time-evolving, high-resolution spectral estimation; adaptive beamforming. *Prerequisite:* ECE 251B or consent of instructor. (S) W. Hodgkiss and B. Rao

**253A. Fundamentals of Digital Image Processing (4)**

Image formation, models, quantization and sampling, 2-D random fields, image transforms, compression and coding, image enhancement, edge detection, morphology. *Prerequisites:* ECE 152A-C, ECE 150B recommended; Ames 162C. (F) S. Chatterjee

**253B. Digital Image Analysis (4)**

Fundamentals of computer vision, scene segmentation, texture analysis, 3-D shape extraction from monocular and stereo images, feature analysis and cue fusion, analysis of time-varying images, understanding of range and structured light images. *Prerequisite:* ECE 253A or consent of instructor. (W) S. Chatterjee

**253C. Digital Image Restoration and Reconstruction (4)**

Image restoration and reconstruction: theory and algorithms, deconvolution, 2-D and 3-D reconstruction from full projections and limited view. Applications in remote sensing, electromagnetics, sonar and medical imaging. *Prerequisite:* ECE 253A. (S) Staff

**254A-B-C. Detection Theory (4-4-4)**

Hypothesis testing, detection of signals in white and colored Gaussian noise; Karhunen-Loève expansion, estimation of signal parameters, maximum-likelihood detection; resolution of signals; detection and estimation of stochastic signals; applications to radar, communications, and optics. *Prerequisite:* ECE 152C. (F,W,S) E. Masry

**256A-B. Time Series Analysis and Applications (4-4)**

Recursive and nonrecursive prediction and filtering; Wiener-Hopf and Kalman-Bucy filters. Series expansions and applications. Time series analysis; probability density, covariance and spectral estimation. Inference from sampled-data, sampling theorems; equally and non-equally spaced data, applications to detection and estimation problem. *Prerequisites:* ECE 250A. (W,S) E. Masry

**257A. Multiuser Communication Systems (4)**

M/G/1, G1/M/1 queues, imbedded chains. Ergodic theory of Markov chains, classification, ergodic theorems. Multiple access systems, random access protocols, capacity, stability, delay and control, reservation and hybrid schemes. *Prerequisites:* ECE 152A, B or equivalent, ECE 159A. Note: ECE 159A is an integral part of this course and should be taken in the fall quarter. (W) R. Rao

**257B. Multiuser Communication Systems (4)**

Markovian networks, Jackson's theorem. Communication networks. Topological design. Flow control: prevention of deadlock and throughput degradation. Delay, throughput power. Routing local/global information, centralized, decentralized schemes, static, dynamic algorithms. Shortest path and minimum average delay algorithms. Comparisons. *Prerequisite:* ECE 257A. (S) R. Rao

**258A-B. Digital Communication (4-4)**

Digital communication theory including performance of various modulation techniques, effects of inter-symbol interference, adaptive equalization, spread spectrum communication. *Prerequisites:* ECE 154A-B-C and ECE 254A or consent of instructor. (W,S) L. Milstein

*Prerequisites:* ECE 154A-B-C and ECE 254A or consent of instructor. (W,S) L. Milstein

**259A. Information Theory (4)**

Introduction to basic concepts, source coding theorems, capacity, noisy-channel coding theorem. *Prerequisites:* ECE 154A-B-C or consent of instructor. (F) L. Milstein

**259B. Algebraic Coding (4)**

Fundamentals of block codes, bounds, introduction to groups, rings and finite fields, nonbinary codes, cyclic codes such as BCH and RS codes, decoding algorithms, applications. (W) J. Wolf

**259C. Coding for Digital Communication (4)**

Coding theory developed from the viewpoint of digital communications engineering, characterization of basic channel models, block and convolutional coding error bounds, maximum-likelihood and sequential decoding, trellis coding and decoding for both wideband and bandlimited channels. *Prerequisites:* ECE 154A-B-C or consent of instructor. (S) A. Viterbi

**260A. VLSI Digital System Design: CAD Tools (4)**

Custom and semicustom VLSI design from the system designer's perspective. VLSI system architectures, design methodologies, and computer-aided design (CAD) tools will be emphasized. Knowledge of basic semiconductor electronics and digital design is assumed. Three hours' lecture. *Prerequisites:* Undergraduate-level semiconductor electronics and digital design; ECE 161B or equivalent or consent of instructor. (F) P. Chau

**260B. VLSI Digital System Design: IC Chip Design Project (4)**

Computer arithmetic, control and memory structures for VLSI implementations, at logic circuit and layout level. Computer-aided design and performance simulations; actual design projects for teams of two to three students per team. Layout done on CAD workstations for project IC chip fabrication. Design projects will be reviewed in class presentation. Three hours' lecture. *Prerequisite:* ECE 260A. (W) P. Chau and R. Fellman

**260C. VLSI Digital System Design: VLSI Testing (4)**

Computer-aided procedures and hardware for testing IC chip design projects of ECE 230A-B-C sequence will be developed. Fabricated chips to be tested. Final reports and reviews of class projects to be presented and discussed in classroom presentations. Three hours' lecture. *Prerequisite:* ECE 260B. (S) P. Chau

**261A. Design of Analog and Digital GaAs Integrated Circuits I (4)**

Introduction to analytical and computer-aided design (CAD) techniques for microwave integrated circuits. Design of active two-ports using scattering parameters. Monolithic realization of low-noise amplifiers using GaAs FETs and HEMTs. Design of monolithic distributed amplifiers. Design of monolithic power amplifiers and mixers. Three hours' lecture. *Prerequisite:* consent of instructor. (W) W. Ku

**261B. Design of Analog and Digital GaAs Integrated Circuits**

Introduction to GaAs digital integrated circuits (IC). Design of simple digital GaAs ICs using DCFL. Design of digital building blocks for complex multipliers, FET butterfly chips, DDS, and oversampled A/D converters. Three hours' lecture. *Prerequisite:* consent of instructor. (S) W. Ku

**263A. Reliable Design of Digital Systems (4)**

Fault tolerance and testability have the common objective of improving the reliability of computer hardware. Knowing the fault models, how faults manifest themselves, how to test fault existence, and how to keep system functioning when fault exists help the engineers choose different techniques in computing and VLSI systems designs. *Prerequisite:* ECE 263A or consent of instructor. (F) T. T. Lin

**263B. Fault-Tolerant Computing and VLSI Testing I (4)**

This course will cover all aspects of fault-tolerant computing and VLSI testing. Topics include fundamental concepts of fault-tolerant hardware design, test pattern generation, signature analysis, system diagnosis and evaluation, and fault tolerance in VLSI-based systems. *Prerequisite:* ECE 263A or consent of instructor. (W) T. T. Lin

**263C. Fault-Tolerant Computing and VLSI Testing II (4)**

Fault tolerance and testability have the common objective of improving system reliability. The second part of the course emphasizes systemwide design issues. Topics include fault-tolerant architecture and systems, design for testability, and computer-aided reliability evaluation. Current research issues in fault-tolerant computing and VLSI testing will be addressed. *Prerequisite:* ECE 263A-B or consent of instructor. (S) T. T. Lin

**270A-B-C. Neurocomputing (4-4-4)**

Neurocomputing is the study of nonalgorithmic information processing. This three-quarter sequence covers neurocomputing theory, design, and application, including sensor processing, knowledge processing, data analysis, and hands-on training with a neurocomputer. *Prerequisite:* graduate standing in ECE or CSE, or consent of instructor. (F,W,S) R. Hecht-Nielsen

**271A-B-C. Linear and Nonlinear Systems (4-4-4)**

Linear algebra, linear vector spaces, matrix functions, linear differential equations, state transition matrix, stability theory, controllability, observability, realization theory, pole placement, observers, singularly perturbed systems, contraction maps, nonlinear differential equations, linearization, Liapunov and Popov stability, describing functions. (Not offered in 1992-93.) *Prerequisites:* ECE 171A and 176A-B-C. (F,W,S) K. Kreutz-Delgado

**272A-B. Stochastic Processes in Dynamic Systems (4-4)**

Diffusion equations, linear and nonlinear estimation and detection, random fields, optimization of stochastic dynamic systems, applications of stochastic optimization to problems. *Prerequisites:* ECE 250A; ECE 272B requires 272A. (W,S) D. Sworder

**273A-B-C. Optimization in Linear Vector Spaces (4-4-4)**

Hilbert spaces, Banach spaces, projection theorem, dual spaces, Hahn Banach theorem, hyperplanes, geometric form of H Banach theorem, modern statistical optimization routines (simulated annealing, evolutionary programming), approaches to large neural net problems derived from the physics literature (chaos, spin glass, basic statistical mechanics). *Prerequisites:* ECE 176A. ECE 273B requires 273A and 273C requires 273B. (F,W,S) A. Sebald

**274A. System Identification (4)**

Model types for system identification (transfer function, state space, ma, arma, armax, Box-Jenkins, etc). Convergence and consistency (identifiability, asymptotic distribution of parameter estimates). Recursive methods, experimental design (sufficient excitation, pre-treatment of data, etc). Modern methods (simulated annealing and evolutionary programming). *Prerequisite:* ECE 275. (W) A. Sebald

**274B. System Identification (4)**

Adaptive control (integrating real-time system identification and control), basics of intelligent control (fuzzy control, evolutionary programming and control). Basics of neural net controllers. *Prerequisite:* ECE 274A. (S) A. Sebald

**275. Parameter Estimation (4)**

Least squares, bias, efficiency, consistency, tolerance intervals, hypothesis tests and other forms of figures of merit for practical estimation, Practical issues in L squares estimation (multicollinearity, heteroskedasticity), MMSE, maximum likelihood and MAP estimation, projection lemma in Hilbert space, numerical aspects, including QR and householder transforma-

## ETHNIC STUDIES

tions, singular value decompositions and pseudoinverse. *Prerequisites: ECE 152A-B and ECE 271A (may be taken concurrently).* (F) A. Sebald

### 276A-B. Advanced Robot Kinematics, Dynamics, and Control (4-4)

Parameterizations and group representations for rotations and general rigid-body Euclidean displacements. Infinitesimal generators and the Lie algebra of rotations and Euclidean displacements. Motion and force propagation operators and their algebra. Operator factorization and inversion of Jacobians and manipulator inertia tensors. Efficient forward- and inverse dynamics algorithms. Contact and grasp kinematics. Closed-chain kinematics and dynamics. Feedback linearizing control. Liapunov stability theory-based adaptive and nonadaptive control. Topics from (time permitting): control of nonholonomic systems; collision avoidance and computational geometry; neural network-based kinematic learning and control. *Prerequisites: ECE 172A-B, ECE 176A-B-C, ECE 152C, prior or concurrent enrollment in AMES 271A-B-C and Phys. 210A. Highly recommended: ECE 273A-B.* (W-S) K. Kreutz-Delgado

### 280. Special Topics in Electronic Devices and Materials (4)

A course to be given at the discretion of the faculty at which topics of interest in electronic devices and materials will be presented by visiting or resident faculty members. It will not be repeated so it may be taken for credit more than once. Three hours' lecture. *Prerequisite: consent of instructor.* Staff

### 281. Special Topics in Radio and Space Science (4)

A course to be given at the discretion of the faculty at which topics of interest in radio and space science will be presented by visiting or resident faculty members. It will not be repeated so it may be taken for credit more than once. Three hours' lecture. *Prerequisite: consent of instructor.* Staff

### 282. Special Topics in Optoelectronics (4)

A course to be given at the discretion of the faculty at which topics of interest in optoelectronic materials, devices, systems, and applications will be presented by visiting or resident faculty members. It will not be repeated so it may be taken for credit several times. Three hours' lecture. *Prerequisite: consent of instructor.* Staff

### 283. Special Topics in Electronic Circuits and Systems (4)

A course to be given at the discretion of the faculty at which topics of interest in electronic circuits and systems will be presented by visiting or resident faculty members. It will not be repeated so it may be taken for credit more than once. Three hours' lecture. *Prerequisite: consent of instructor.* Staff

### 284. Special Topics in Computer Engineering (4)

A course to be given at the discretion of the faculty at which topics of interest in computer engineering will be presented by visiting or resident faculty members. It will not be repeated so it may be taken for credit more than once. Three hours' lecture. *Prerequisite: consent of instructor.* Staff

### 285. Special Topics in Robotics and Control Systems (4)

A course to be given at the discretion of the faculty at which topics of interest in robotics and control systems will be presented by visiting or resident faculty members. It will not be repeated so it may be taken for credit more than once. Three hours' lecture. *Prerequisite: consent of instructor.* Staff

### 287A,B,C. Special Topics in Communication Theory and Systems (4)

A course to be given at the discretion of the faculty at which topics of interest in information science will be presented by visiting or resident faculty members. It will not be repeated so it may be taken for credit more than once. Three hours' lecture. *Prerequisite: consent of instructor.* Staff

### 288. Special Topics in Applied Physics (1-8)

A course to be given at the discretion of the faculty at which topics of current interest in applied physics will be presented by visiting or resident faculty members. (S/U grades optional.) *Prerequisite: consent of instructor.* Staff

### 289A,B,C. Special Topics in Adaptive Signal Processing (4)

Current research issues in adaptive signal processing will be presented by the instructor and by graduate students under faculty direction. Topics include real-time implementations of adaptive filters, performance analysis of various adaptive algorithms, learning systems, and adaptive filtering applications. Three hours' lecture. *Prerequisites: ECE 251A, B, C.* (F, W, S) J. Zeidler

### 291. Graduate Seminar in Applied Physics (2)

Weekly discussion of current research literature. Staff

### 292. Graduate Seminar in Radio and Space Science (2)

Research topics in radio astronomy, space plasmas, and solar system physics. (S/U grades only.) B. Rickett

### 293. Graduate Seminar in Communication Theory and Systems (2)

Weekly discussion of current research literature. R. Rao

### 294. Graduate Seminar in Applied Solid State Physics (2)

Research topics in applied solid state physics and quantum electronics. H-L. Luo

### 295. Graduate Seminar in Computer Engineering (2)

Biweekly discussion of research topics in computer engineering. Computer engineering is currently the most impacted field both in industry and academia. Computer engineering is the science of searching for an optimum within constraints of available methods and resources. Three hours' seminar. *Prerequisite: consent of instructor.* (F,W,S) T. T. Lin

### 296. Graduate Seminar in Optical Signal Processing (2)

Research topics of current interest in holography. S. Lee

### 298. Independent Study (1-16)

Open to properly qualified graduate students who wish to pursue a problem through advanced study under the direction of a member of the staff. (S/U grades only.) *Prerequisite: consent of instructor.*

### 299. Research (1-16)

(S/U grade only.)

### 501. Teaching (1-4)

Teaching and tutorial activities associated with courses and seminars. Not required for candidates for the Ph.D. degree. Number of units for credit depends on number of hours' devoted to class or section assistance. (S/U grade only.) *Prerequisite: consent of department chair.*

## Courses

### 10. Writing (4)

This course is designed to provide intensive practice in the conventions of written English to those students whose first language is not English. This course prepares students for the Subject A writing course.

### 11. Writing Workshop (2)

This course is offered to students currently enrolled in ESL 10 who need additional help improving their writing. The course will include class discussion and individualized instruction, and will address students' grammar and syntax needs.

### 12. Critical Reading (4)

This course is designed to offer ESL students directed practice in the critical reading skills required of them. Students will be guided to approach university-level readings analytically and to formulate critical responses to the texts.

### 500. Apprentice Teaching of ESL (1-4)

The course, designed for graduate students serving as teaching assistants, includes discussion of teaching theories, techniques, and materials under the supervision of the instructor in charge of the course.

## ETHNIC STUDIES

OFFICE: Literature Building, Rm. 3410, Warren College

### Faculty

Paule Cruz Takash, Ph.D., *Assistant Professor*  
Ramon A. Gutierrez, Ph.D., *Professor and Chair*  
George Lipsitz, Ph.D., *Professor*  
Yen Le Espiritu, Ph.D., *Assistant Professor*

### Associated Faculty

James Cheatham, *Music*  
Matthew Chen, *Linguistics*  
Wayne Cornelius, *Political Science*  
Steve Cornell, *Sociology*  
Anthony Curiel, *Theatre*  
Steve Erie, *Political Science*  
Claudio Fenner-Lopez, *Communication/Visual Arts*  
Frances Foster, *Literature*  
Floyd Gaffney, *Theatre*  
Harry Hirsch, *Political Science*  
Jorge Huerta, *Theatre*  
Arend Lijphardt, *Political Science*  
James Lin, *Mathematics*  
Lisa Lowe, *Literature*  
Cecil Lytle, *Music*  
George Mariscal, *Literature*  
Masao Miyoshi, *Literature*  
Vicente Rafael, *Communication*  
Edward Reynolds, *History*  
Ramon Eduardo Ruiz, *History*  
Marta Sanchez, *Literature*  
Rosaura Sanchez, *Literature*

## ENGLISH AS A SECOND LANGUAGE

Office: 3232 Literature Building, Warren College

### Director

Margaret Loken, M.A.



Julie Saville, *History*  
 Faustina Solis, *Emeritus, Urban Studies/  
 Community and Family Medicine*  
 Ricardo Stanton-Salazar, *Sociology*  
 Olga Vasquez, *Communication*  
 Sherley Anne Williams, *Literature*

Ethnic studies is the study of the social, cultural, and historical forces that have shaped the development of America's diverse ethnic peoples over the last 500 years and which continue to shape our future. Focusing on immigration, slavery, and confinement, those three social processes that combined to create in the United States a nation of nations, ethnic studies intensively examines the histories, languages, and cultures of America's racial and ethnic minority groups in and of themselves, in their relationships to each other, and, particularly, in structural contexts of power.

The curriculum of the Department of Ethnic Studies is designed to 1) study intensively the particular histories of different ethnic and racial groups in the United States, especially intragroup stratification; 2) to draw larger theoretical lessons from comparisons among these groups; 3) to articulate general principles that shape racial and ethnic relations both currently and historically; and 4) to explore how ethnic identity is constructed and reconstructed over time both internally and externally.

A degree in ethnic studies offers training of special interest to those considering admission to graduate or professional schools and careers in education, law, medicine, public health, social work, journalism, business, city planning, politics, psychology, international relations, or creative writing. A major in ethnic studies is designed to impart fundamental skills in critical thinking, comparative analysis, social theory and research analysis, and written expression. These skills will give students the opportunity to satisfy the increasingly rigorous expectations of graduate admissions committees and prospective employers for a broad liberal arts perspective.

An ethnic studies major offers excellent preparation for teaching in the elementary schools. If you are interested in earning a California teaching credential from UCSD, contact the Teacher Education Program for information about the prerequisite and professional preparation requirements. It is recommended that you contact TEP as early as possible in your academic career.

## THE MAJOR

To receive a B.A. degree with a major in ethnic studies, students must meet the following requirements:

1. A three-quarter course lower-division sequence (Ethnic Studies 1A-B-C). Ideally this sequence should be taken during the sophomore year as an intensive introduction to the history and theoretical dimensions of ethnic diversity in the United States. Ethnic Studies 1A-B-C, Introduction to Ethnic Studies, will consist of the following three courses: Population Histories of the United States, Immigration and Assimilation in American Life, Race and Ethnic Relations in the United States.

2. A minimum of twelve four-unit upper-division courses in the Department of Ethnic Studies must be completed from the following five categories:

A. One four-unit upper-division course that intensively explores the theory and comparative methods of ethnic studies (Ethnic Studies 100: Theories and Methods of Ethnic Studies). All ethnic studies majors should complete this course before proceeding with the other requirements listed below.

B. Four upper-division ethnic studies history and social science courses from those listed below:

- ES 102: Racial Inequality in America
- ES 103: American Culture and Ethnic Identity
- ES 104: The Idea of Race in America
- ES 105: Ethnic Diversity and the City
- ES 106: Ethnoracial Transformations of U.S. Communities
- ES 112: History of Native Americans in the United States
- ES 115: The Sociology of Indian-White Relations
- ES 119: Multiracial Societies in the Americas
- ES 120: Comparative Asian-American History, 1850-1965
- ES 121: Contemporary Asian-American History
- ES 130: Social and Economic History of the Southwest I
- ES 131: Social and Economic History of the Southwest II
- ES 150: Politics of Cultural Pluralism and National Integration
- ES 151: Ethnic Politics in America
- ES 152: Law and Civil Rights
- ES 155: The Supreme Court and the Constitution
- ES 156: Civil Liberties—The Rights of Criminals and Minorities
- ES 157: Ethnic Conflict in the Third World
- ES 158: Immigration Policy and Politics
- ES 169: African Society and the Slave Trade
- ES 170: Slavery and the Atlantic World
- ES 171: Slavery and Freedom in the Nineteenth-Century United States

- ES 197: Field Work in Racial and Ethnic Communities\*
- ES 198: Directed Group Studies\*
- ES 199: Supervised Independent Study and Research\*

### Colloquia

- ES 180: Topics in Mexican-American History
  - ES 181: American Slave Communities in Comparative Perspective
  - ES 182: Segregation, Freedom Movements, and the Crisis of the Twentieth Century
  - ES 183: Gender, Race, Ethnicity, and Class
- C. At least three upper-division courses that focus on language and ethnicity:
- ES 140: Language and American Ethnicity
  - ES 141: Language and Culture
  - ES 145: Spanish Language in the United States

\*Only two will be counted in fulfillment of this requirement.

Due to the limited course offerings in this general area during the 1992-93 academic year, this requirement may be fulfilled by taking either three upper-division courses in language (e.g., Chinese, Vietnamese, Spanish, etc.) or area studies (e.g., Latin American studies, Third World studies, Japanese studies, etc.), or some combination of language and area studies. Students must seek faculty advice on which three upper-division courses would best satisfy this requirement and yield the most rigorous training.

D. At least three upper-division ethnic studies courses on the literature and cultural expressions of American racial and ethnic minorities:

- ES 101: Ethnic Images in Film
- ES 110: Cultural World Views of Native Americans
- ES 111: Native American Literature
- ES 122: Asian-American Culture and Identity
- ES 132: Chicano Dramatic Literature
- ES 133: Hispanic-American Dramatic Literature
- ES 134: The Chicana
- ES 135: Development of Chicano Literature
- ES 136: Themes and Motifs in Chicano Literature
- ES 137: Chicano Prose
- ES 138: Chicano Poetry
- ES 139: Chicano Literature in English
- ES 144: Colonialism and Culture
- ES 146A-B: Theatrical Ensemble
- ES 172: Afro-American Prose
- ES 173: Afro-American Poetry
- ES 174: Themes in Afro-American Literature
- ES 175: Literature of the Harlem Renaissance

- ES 176: Black Music/Black Texts: Communication and Cultural Expression
- ES 177: Modern Black Drama
- ES 178: Introduction to Oral Music
- ES 179A-B: Music of Black Americans

E. One four-unit field methods course (Ethnic Studies 190: Research Methods: Studying Ethnic and Racial Communities).

3. Since the goal of the Department of Ethnic Studies is to intensively study both the particular histories of various ethnic and racial groups in the United States and to draw larger theoretical lessons from comparisons among and between groups, students may not fulfill requirements 2B and 2D by focusing all of the seven required courses on only one ethnic or racial group.

## THE MINOR

Students wishing to minor in ethnic studies must take six four-unit upper-division courses from the department's offerings. All students minoring in ethnic studies must enroll in Theories and Methods of Ethnic Studies (ETHN 100) and Research Methods: Studying Ethnic and Racial Communities (ETHN 190). At least two, but not more than three, of the four remaining courses must be selected from either the ethnic studies history and social studies courses (listed above as 2B), or the ethnic studies literature and cultural expressions courses (listed above as 2D). While the language and ethnicity courses currently offered may also be used to satisfy this requirement, foreign language and area studies courses from other departments may not.

## Courses

### LOWER DIVISION

- 1A. Introduction to Ethnic Studies: Population Histories of the United States (4)**  
This course examines the comparative historical demography of what is today the United States, focusing on the arrival, growth, distribution, and redistribution of immigrants from Asia, Europe, Africa, and Latin America.
- 1B. Introduction to Ethnic Studies: Immigration and Assimilation in American Life (4)**  
A history of immigration to the United States from colonial times to the present, with emphasis on the roles of ethnic and racial groups in economics, power relations between dominant and subordinate groups, and contemporary ethnic and racial consciousness.
- 1C. Introduction to Ethnic Studies: Race and Ethnic Relations in the United States (4)**  
This course examines the theoretical literature on race and ethnicity, focusing on issues of domination and subordination, and the historical emergence of racism and ethnic conflict. Attention

is given to class and gender differences within racial and ethnic groups.

- 90. Undergraduate Seminar (1)**  
A seminar intended for exposing undergraduate students, especially freshmen and sophomores, to exciting research programs conducted by department faculty. Enrollment is limited.

### UPPER DIVISION

- 100. Theories and Methods in Ethnic Studies (4)**  
An introduction to research in ethnic studies with special emphasis on theories, concepts, and methods. Students will explore how racial and ethnic categories are shaped by gender, class, and regional experiences and will study ethnicity and race in comparative perspective.
- 101. Ethnic Images in Film (4)**  
An upper-division lecture course studying representations of ethnicity in the American cinema. Topics include ethnic images as narrative devices, the social implications of ethnic images, and the role of film in shaping and reflecting societal power relations.
- 102. Racial Inequality in America: A Comparative Historical Analysis (4)**  
This course will examine slavery, segregation, conquest, discrimination, and exploitation as social and cultural institutions shaping contemporary life in America. The origins and implications of inequality will be explored through analysis and interpretation of primary and secondary sources.
- 103. American Culture and Ethnic Identity (4)**  
This course examines how the ethnic experience in the United States has been represented, mediated, and shaped by expressive cultural forms including literature, folklore, visual art, and mass media.
- 104. The Idea of Race in America (4)**  
This course will examine the intellectual history of race as a concept in American culture, surveying the origins and evolution of both racist and antiracist theories and beliefs.
- 105. Ethnic Diversity and the City (4)**  
This course will examine the city as a crucible of ethnic identity exploring both the racial and ethnic dimensions of urban life in the U.S. from the Civil War to the present.
- 106. Ethnoracial Transformations of U.S. Communities (4)**  
Course examines the rapid growth of ethnic/racial minority populations in U.S. cities; how long-term residents respond to these ethnoracial transformations; how ethnic/racial groups are/are not being incorporated into American institutions; and implications of these transformations for the nation.
- 110. Cultural World Views of Native Americans (4)**  
Using interdisciplinary methods, this course examines the cultural world views of various Native American societies in the United States through an exploration of written literary texts and other expressive cultural forms such as dance, art, song, religious and medicinal rituals.
- 111. Native American Literature (4)**  
This course analyzes Native American written and oral traditions. Students will read chronicles and commentaries on published texts, historic speeches, trickster narratives, oratorical and prophetic tribal epics, and will delve into the methodological problems posed by tribal literature in translation.
- 112. History of Native Americans in the United States (4)**  
This course examines the history of Native Americans in the United States, with emphasis on the lifeways, mores, warfare, and relations with the United States government. Attention is given to the background and evolution of acculturation up to the present day.

- 115. The Sociology of Indian-White Relations (4)**  
Students will examine historical and contemporary relations between Native American societies and the United States, paying particular attention to transformation in Indian collective identities, political power, and collective action, and to current political and economic issues. (Cross-listed with Sociol. 181i.)
- 119. Multiracial Societies in the Americas (4)**  
This course explores the genesis, evolution, and contradictions of racially heterogeneous societies in the Americas, from European conquest to the present. Topics: the social history of Indians, blacks, Asians, and their interactions with Europeans, and racial, sexual, and class divisions.
- 120. Comparative Asian-American History 1850-1965 (4)**  
Using comparative methods of analysis, this course will examine the historical experience of Asian-Americans in areas such as immigration, settlement patterns, labor, economic development, race relations, community institutions, and occupational patterns between 1850 and 1965.
- 121. Contemporary Asian-American History (4)**  
The course will study changes in Asian-American communities as a result of renewed immigration since 1965; the influx of refugees from Vietnam, Kampuchea, and Laos; the impact of contemporary social movements on Asian-Americans' current economic, social, and political status.
- 122. Asian-American Culture and Identity (4)**  
A survey of Asian-American cultural expressions in literature, art, and music to understand the social experiences that helped forge Asian-American identity. Topics: culture conflict, media portrayals, assimilation pressures, the model minority myth, and interethnic and class relations.
- 130. Social and Economic History of the Southwest I (4)**  
This course examines the history of the Spanish and Mexican Borderlands (what became the U.S. Southwest) from roughly 1400 to the end of the U.S.-Mexican war in 1848, focusing specifically on the area's social, cultural, and political development. (Cross-listed with HIUS 158.)
- 131. Social and Economic History of the Southwest II (4)**  
This course examines the history of the American Southwest from the U.S.-Mexican War in 1846-48 to the present, focusing on immigration, racial and ethnic conflict, and the growth of Chicano national identity. (Cross-listed with HIUS 159.)
- 132. Chicano Dramatic Literature (4)**  
Focusing on the contemporary evolution of Chicano dramatic literature, the course will analyze playwrights and theatre groups that express the Chicano experience in the United States, examining relevant *actos*, plays, and documentaries for their contributions to the developing Chicano theatre movement. (Cross-listed with Theatre 166.)
- 133. Hispanic-American Dramatic Literature (4)**  
This course examines the plays of leading Cuban-American, Puerto Rican, and Chicano playwrights in an effort to understand the experiences of these Hispanic-American groups in the United States. (Cross-listed with Theatre 178.)
- 134. The Chicana (4)**  
A critical study of gender, ethnicity, class, and national origin as it pertains to the Chicana. The course will have a historical focus and examine literary and social science texts written by Chicana/o and non-Chicano writers.
- 135. Development of Chicano Literature (4)**  
A cross-genre survey of major works in Chicano literature from its beginning to the present with primary emphasis on contemporary works. Speaking, writing, and reading knowledge of Spanish is required. (Cross-listed with Lit/Sp 150.)

**136. Themes and Motifs in Chicano Literature (4)**

This course is organized around some of the significant themes and ideas expressed in specific Chicano writings. The importance of these themes to particular Chicano experience is considered. Speaking, writing, and reading knowledge of Spanish is required. (Cross-listed with Lit/Sp 151.)

**137. Chicano Prose (4)**

A study of the different genres of Chicano prose: novel, short story, poetry, autobiography. Attention is given to Chicano prose styles and the historical and cultural movement in which they develop. Speaking, writing, and reading knowledge of Spanish is required. (Cross-listed with Lit/Sp 152.)

**138. Chicano Poetry (4)**

An analysis and discussion of major forms and modes of Chicano poetry, with primary emphasis on the developing styles of the poets and on the study of texts' and authors' historical moments. Speaking, writing, and reading knowledge of Spanish is required. (Cross-listed with Lit/Sp 153.)

**139. Chicano Literature in English (4)**

Introduction to the literature in English by the Chicano population, the men and women of Mexican descent who live and write in the United States. The primary focus is the contemporary period. (Cross-listed with Lit/En 180.)

**140. Language and American Ethnicity (4)**

This course examines the intersection of language and ethnicity in the United States, focusing on the social and political impact of bilingualism, ethnically based English dialects, and standard and nonstandard English.

**141. Language and Culture (4)**

A survey exploring the interconnectedness of language and culture. Special areas to be emphasized include child language learning and socialization, alternative sources of knowledge, and culturally specific styles of interaction.

**144. Colonialism and Culture (4)**

This course examines colonial narratives, slave accounts, essays and stories by both colonizers and colonized. It also explores the issue of nationalism in determining the limits of colonialism among minority groups in the United States and in the Third World. (Cross-listed with Com/Cul 179.)

**145. Spanish Language in the United States (4)**

A sociolinguistic study of the popular dialects in the United States and their relation to other Latin American dialects. The course will cover phonological and syntactic differences between the dialects as well as the influence of English on the Southwest dialects. (Cross-listed with Lit/Sp 162.)

**146A-B. Theatrical Ensemble (4-4)**

An intensive theatre practicum designed to generate theatre created by an ensemble, with particular emphasis upon the analysis of text. Students will explore and analyze scripts and authors. Ensemble segments include: black theatre, Chicano theatre, feminist theatre, commedia dell'arte theatre. (Cross-listed with Theatre 187A-B.)

**150. Politics of Cultural Pluralism and National Integration (4)**

This course comparatively analyzes the problems posed by subnational loyalties founded on ethnic, linguistic, racial, religious, and caste identities in Asia, Africa, Europe, and the Western Hemisphere. Particular attention will be given to the processes of national integration in multicultural politics.

**151. Ethnic Politics in America (4)**

This course will survey the political effects of immigration, ethnic mobilization, and community building in America, and the contemporary role of ethnicity in politics and intergroup relations.

**152. Law and Civil Rights (4)**

In this course students explore the relationship between race, class, and law as it applies to civil rights both in an historical

and a contemporary context. Topics include racism and the law, history of the 14th Amendment, equal protection, school desegregation, and affirmative action.

**155. The Supreme Court and the Constitution (4)**

An introduction to the study of the Supreme Court and constitutional doctrine. Topics will include the nature of judicial review, federalism, race, and equal protection. The relation of judicial and legislative power will also be examined. (Cross-listed with Poli. Sci. 104A.)

**156. Civil Liberties—The Rights of Criminals and Minorities (4)**

This course examines the legal issues surrounding the rights of criminal suspects, as well as the rights of "marginal" groups such as aliens, illegal immigrants, and the mentally ill. It also includes a discussion of the nature of discrimination in American society. (Cross-listed with Poli. Sci. 104C.)

**157. Ethnic Conflict in the Third World (4)**

A comparative analysis of ethnic conflict and of conflict resolution by consociational methods in Lebanon, Cyprus, Malaysia, Burundi, and South Africa. Comparisons will also be made with the United States, other Western countries, and other Third World countries. (Cross-listed with Poli. Sci. 135A.)

**158. Immigration Policy and Politics (4)**

A comparative analysis of attempts by the U.S., Western Europe, and Japan to initiate, regulate, and restrict immigration from the Third World, 1940 to present. Social and economic factors shaping immigration policies, anti-immigrant movements, and political parties in industrialized countries. (Cross-listed with Poli. Sci. 150A.)

**169. African Society and the Slave Trade (4)**

Topics include trans-Saharan trade, slavery within African societies, Atlantic slave trade, problems of numbers exported and profitability, impact of slave trade on African societies, and the abolition of the slave trade. (Cross-listed with HIAF 130.)

**170. Slavery and the Atlantic World (4)**

An examination of the emergence and consolidation of slave societies in regions of the Caribbean and British North America from the seventeenth through the early nineteenth centuries. (Cross-listed with HIUS 135.)

**171. Slavery and Freedom in the Nineteenth Century (4)**

An examination of social, cultural, and political dimensions of the transition from slave to wage labor in the era of the Civil War, Reconstruction, and the Gilded Age. (Cross-listed with HIUS 136.)

**172. Afro-American Prose (4)**

Students will analyze and discuss the novel, the personal narrative, and other prose genres, with particular emphasis on the developing characters of Afro-American narrative and the cultural and social circumstances that influence their development. (Cross-listed with Lit/En 183.)

**173. Afro-American Poetry (4)**

A close reading and analysis of selected works of Afro-American poetry as they reflect styles and themes that recur in the literature. (Cross-listed with Lit/En 184.)

**174. Themes in Afro-American Literature (4)**

This course focuses on the influence of slavery upon African-American writers. Our concern is not upon what slavery was but upon what it is within the works and what these texts reveal about themselves, their authors, and their audiences. (Cross-listed with Lit/En 185.)

**175. Literature of the Harlem Renaissance (4)**

The Harlem Renaissance (1917-39) focuses on the emergence of the "New Negro" and the impact of this concept on black literature, art, and music. Writers studied include Claude McKay, Zora N. Hurston, and Langston Hughes. Special emphasis on new themes and forms. (Cross-listed with Lit/En 186.)

**176. Black Music/Black Texts: Communication and Cultural Expression (4)**

This course explores the role of music as a traditional form of communication among Africans, Afro-Americans, and West Indians. Special attention given to poetry of black music, including blues and other forms of vocal music expressive of contestatory political attitudes. (Cross-listed with Lit/En 187.)

**177. Modern Black Drama (4)**

From Lorraine Hansberry's *Raisin in the Sun* to the latest plays of Ed Bullins, black drama has mirrored and, occasionally, forecast the mood and aspirations of black people in America. The course examines plays, playwrights, and participants in contemporary black theatre. (Cross-listed with Theatre 165.)

**178. Introduction to Oral Music (4)**

An introductory study of oral music in Western and non-Western cultures, with emphasis on the impact of oral transmission of ideas and customs, and the nature of improvisation in various indigenous cultures. Music studied includes Afro-American, African, Asian, and Oceanian. (Cross-listed with Music 126.)

**179A-B. Music of Black Americans (4-4)**

The first quarter of this course will investigate the vocal music of black American culture, primarily the development of the spiritual and the blues traditions, while the second quarter will critically study the history of jazz in America. (Cross-listed with Music 127A-B.)

**■ COLLOQUIA****180. Topics in Mexican-American History (4)**

This colloquium studies the racial representation of Mexican-Americans in the United States from the nineteenth century to the present, examining critically the theories and methods of the humanities and social sciences. (Cross-listed with HIUS 167.)

**181. American Slave Communities in Comparative Perspective (4)**

A reading and discussion seminar that explores topics related to the emergence, consolidation, and destruction of plantation slave regimes in regions of the Caribbean and the United States. Topics will vary. (Cross-listed with HIUS 164.)

**182. Segregation, Freedom Movements, and the Crisis of the Twentieth Century (4)**

A reading and discussion seminar that views the origins of segregation and the social movements that challenged it between 1890 and 1970 in a comparative framework. (Cross-listed with HIUS 165.)

**183. Gender, Race, Ethnicity, and Class**

Gender is often neglected in studies of ethnic/racial politics. This seminar explores the relationship of race, ethnicity, class, and gender by examining the participation of working class women of color in community politics and how they challenge mainstream political theory.

**■ SEMINARS AND INDEPENDENT STUDIES****190. Research Methods: Studying Racial and Ethnic Communities (4)**

The course offers students the basic research methods with which to study ethnic and racial communities. The various topics to be explored include human and physical geography, transportation, employment, economic structure, cultural values, housing, health, education, and intergroup relations.

**197. Fieldwork in Racial and Ethnic Communities (4)**

This course comprises supervised community fieldwork on topics of importance to racial and ethnic communities in the greater San Diego area. Regular individual meetings with faculty sponsor and written reports are required. (May be repeated for credit.)

## FRONTIERS OF SCIENCE

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### 198. Directed Group Studies (4)

Directed group study on a topic or in a field not included in the regular department curriculum by special arrangement with a faculty member. (May be repeated for credit.)

### 199. Supervised Independent Study and Research (4)

Individual research on a topic that leads to the writing of a major paper. (May be repeated for credit.)

### 500. Apprentice Teaching in Ethnic Studies

A course in which teaching assistants are aided in learning proper teaching methods by means of supervision of their work by the faculty: handling of discussions, preparation and grading of examinations and other written exercises, and student relations.

## ▼ FIFTH COLLEGE

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OFFICE: Provost, Fifth College, Building 412, Matthews Administrative and Academic Complex

### THE MAKING OF THE MODERN WORLD/WRITING PROGRAM

OFFICE: Fifth College Writing Program, Building 412, Matthews Administrative and Academic Complex

See "The Making of the Modern World" program for Fifth Writing.

### FIFTH COLLEGE HONORS PROGRAM

OFFICE: Provost, Fifth College, Building 412, Matthews Administrative and Academic Complex

The Fifth College Honors Program provides outstanding students with special courses, cultural activities, and other opportunities for academic enrichment and recognition. Particularly well-prepared entering students will be invited to participate in the Freshman Honors Program. During their first year at Fifth College, these students will enroll in special seminars in which internationally oriented faculty members from a variety of disciplines will discuss their research. This small group setting is designed to give selected students an opportunity for direct, informal interactions with faculty. Second-year students with GPAs of 3.5 or higher have the opportunity to pursue independent study with a faculty member. Students generally select themes or topics from material encountered in MMW.

### 10. Fifth Freshman Honors Seminar (0)

Biweekly, two-hour seminar conducted by five different members of Fifth College faculty, who will introduce students to their own research projects having a cross-cultural or international focus. Fifth College. *Prerequisite: by invitation only.* Pass/Not Pass grades only. (F)

### 20. Freshman Honors Seminar: International Themes (1)

Each quarter a faculty member engaged in research with an international component will lead a seminar devoted to some aspect of his or her research. *Prerequisite: by invitation only.* Pass/Not Pass only. May be taken for credit two times. (W,S)

### 92. Honors Project (2)

Individual project on a topic related to the MMW sequence done under direction of a faculty member. Open only by special permission of Fifth College to students who received Provost's Honors in first year at UCSD. Repeatable for credit twice up to a total of six units over three quarters. Pass/Not Pass only.

### 100. Writing about Cross-Cultural Transitions (2)

In this writing-intensive course students will read theories of cultural relativism and cross-cultural interaction; analyze how writers and scholars represent cultural "otherness"; and submit three five-page papers for peer critique and instructor evaluation. They will revise one of the three papers for their final project. *Prerequisite: participation in a program abroad.*

### 196. Honors Project (4)

Senior thesis research project for students who have been accepted into the Fifth College Individual Studies major. Project will be carried out under supervision of one or more faculty members. Depending on scope of the project, may be taken for four or eight units of credit in a single quarter, or eight units distributed over two quarters. *Prerequisite: admission to Fifth Individual Studies major.*

### 199. Fifth Independent Studies (4)

The content of this independent study course, which may not duplicate any existing course on campus, will be determined by a supervising faculty member and tailored to fit specific content needs of students pursuing the Fifth College Individual Studies major. *Prerequisite: admission to Fifth Individual Studies major.*

### FIFTH SEMINAR

OFFICE: Provost, Fifth College, Building 412, Matthews Administrative and Academic Complex

### 90. Undergraduate Seminar (1)

A seminar intended for exposing undergraduate students, especially freshmen and sophomores, to exciting research programs conducted by the faculty. *Prerequisite: none.* Pass/Not Pass only. (F,W,S)

## ▼ FRONTIERS OF SCIENCE

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OFFICE: 1512 Galbraith Hall, Revelle College

These courses in the frontiers of knowledge are concerned with three kinds of frontiers:

1. Recent discoveries or breakthroughs in scientific research and in technology.
2. The frontiers between different sciences where the areas of human understanding depend on the interactions between two or more sciences or technologies, such as the many problems related to energy.
3. The frontiers between science and other human affairs, including the practical social prob-

lems where science and technology can contribute to a solution.

The Frontiers of Science courses are specifically designed to be used as a noncontiguous minor or as noncontiguous electives by non-science majors in Revelle College. They may also be used as electives and/or to fulfill requirements in other colleges (see relevant provost's office for details). With the approval of the appropriate faculty adviser, certain courses may also be used in partial fulfillment of requirements for a science minor.

**All Frontiers of Science courses presuppose some familiarity with college-level science and mathematics. For that reason, these courses require junior or senior standing and either the equivalent or completion of the Revelle general-education requirements in natural science (biology, chemistry, calculus, and physics) or the consent of the instructor.**

Freshmen and sophomores (or others) who wish to take science courses for which there are no prerequisites should also see Earth Sciences 1, 2, and 4, Physics 5, and lower-division courses organized for the non-major by the Department of Biology. A maximum of two such lower-division courses can be used in partial fulfillment of an *approved* Frontiers of Science minor. However, Revelle students who elect to take noncontiguous science electives in lieu of an approved minor may use three noncontiguous lower-division science courses.

## Courses

### 35. Society and the Sea (4)

Introduction to the oceans and their relationship to humankind. Selected topics include ocean-related science, engineering, research, economics, and international relations (emphasizing countries of the Pacific Rim); living and non-living resources; coastal zone management; military and social aspects; and the sea in weather and climate. *Prerequisite: none.* (F)

### 143. Size, Scale, and Structure (4)

An exploration of morphology—from regular polygons to minimal surface to fractals—and a study of growth processes that produce patterns and structures. Applications to biology, physics, chemistry, art, computer science, engineering, architecture, etc. Many ideas from mathematics and the physical sciences are introduced, but the treatment is kept elementary (e.g., calculus is not used). Much of the course is motivated by D'Arcy Thompson's classic treatise *On Growth and Form* and its progeny. *Prerequisite: background in algebra and trigonometry.*

## ▼ GREEK LITERATURE

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See Literature.



## HEALTH CARE—SOCIAL ISSUES

OFFICE: Interdisciplinary Programs, Literature Building, Second Floor, Warren Campus

Health care—social issues is an interdisciplinary minor designed to enhance students' competence in analyzing complex social and ethical implications and ramifications of health care issues, policies, and delivery systems. Students gain an understanding of how the economy, culture, technology, and sociological and psychological processes influence modern health care. Although it is administered by Warren College, it is available to all UCSD students with a general interest in health care as well as to students considering health care careers. This minor offers UCSD students the opportunity to examine health care-related issues from the perspectives of a wide range of disciplines, including anthropology, economics, philosophy, psychology, sociology, urban studies, and science and technology. By bringing together course work from these academic departments, this interdisciplinary curriculum offers a breadth of intellectual experience that enhances students' undergraduate education and their preparation for professional and postgraduate education in health care professions.

Students should consult an academic adviser in their college provost's office to determine how the health care—social issues minor can best meet their college's graduation requirements. Students who complete the health care—social issues course work but do not use it as a minor (or program of concentration) may elect to have a special transcript notation certifying completion of the program. Transcript notation requests must be obtained from and approved by the Interdisciplinary Programs Office. Declarations (forms officially designating health care—social issues a minor and listing the specific course work selected by the student) and petitions (forms requesting changes in or exceptions to course requirements) for the health care—social issues minor must first be reviewed and approved by the coordinator of Interdisciplinary Programs and then by the student's college academic advising office.

Students are strongly urged to supplement the health care—social issues minor with a health-related internship. The Academic Internship Program offers internship placements in clinical settings and with medical research teams that provide valuable experience, career clarification, and an opportunity to apply theories learned in course work. Juniors and seniors with at least a 2.5 overall grade-point average are eligible and

can earn from four to sixteen units of academic credit for the internship experience.

Resource materials, information, workshops, and other supplementary programs for students considering health care careers are also available through the Career Services Center, the Student Health Service, and faculty advisers in the academic departments. Further information on these programs and activities is available at the Interdisciplinary Programs Office, Literature Building, Second Floor, Warren Campus.

### HEALTH CARE—SOCIAL ISSUES MINOR REQUIREMENTS

The minor consists of six courses (two required and four electives, chosen from a list of approved courses). At least four courses (Philosophy 122, which is required, and three electives) must be taken at the upper-division level. Upper-division electives must be chosen from a department other than that of the student's major and must be distributed in two or more disciplines. A lower-division elective course must be followed by a health-related upper-division course in the same department. For full descriptions of the following courses, please see departmental listings.

The health care—social issues minor is applicable as a Warren College program of concentration in the social sciences.

#### REQUIRED COURSES

4. Sociology 40—Sociology of Health Care Issues
5. Philosophy 122—Bio-Medical Ethics

#### ELECTIVE COURSE OPTIONS

Four courses to be chosen from the following list. At least three must be upper-division and from a department other than that of the student's major.

##### Anthropology

- 10—Introduction to Physical Anthropology
- 22—Introduction to Cultural Anthropology
- 128—Anthropology of Medicine
- 155—Models of Madness
- 191—Seminar in Medical Anthropology
- 193—Witchcraft, Shamanism, and Psychiatry

##### Contemporary Issues

- 22—Human Sexuality
- 40—The AIDS Epidemic
- 136—Anthropology of Medicine
- 181—Seminar in Medical Anthropology

##### Economics

- 1A, 1B—Elements of Economics
- 138—Economics of Health

##### Philosophy

- 124—Contemporary Moral Issues
- 127—Professional Ethics
- 185—Special Topics (prior approval of topic required)

##### Psychology

- 1—Psychology
- 2—General Psychology: Biological Foundations
- 9—Brain Damage and the Mind
- 60—Introduction to Statistics
- 104—Introduction to Social Psychology
- 153—Clinical Psychology
- 154—Behavior Modification
- 155—Social Psychology and Medicine
- 168—Psychological Disorders of Childhood
- 179—Drug Addiction and Mental Disorders
- 181—Drugs and Behavior

##### Science, Technology, and Public Affairs

- 181—Elements of International Medicine

##### Sociology

- 1A, 1B—The Study of Society
- 135—Sociology of Health and Illness
- 136A—Sociology of Mental Illness: Historical
- 136B—Sociology of Mental Illness: Contemporary
- 137—Alcohol and Society
- 143—Suicide

##### Urban Studies and Planning

- 143—The U.S. Health Care System
- 144—Environmental and Preventive Health Issues
- 145—Aging: Social and Health Policy Issues
- 146—Case Studies in Health Care Programs: Children and Families
- 147—Case Studies in Health Care Programs: The Poor and Underserved

### RECOMMENDED INTERNSHIP EXPERIENCE

Health care-related internship (AIP 197): to be arranged at least one quarter in advance through



## HISTORY

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the Academic Internship Program, Literature Building, Second Floor, Warren Campus. Clinical and research placements are available. For each four units of credit, ten hours per week for one quarter plus a ten-page research paper are required.

## HEBREW LITERATURE

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See Literature.

## HISTORY

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OFFICE: Room 5024, Humanities and Social Sciences Bldg., Muir College

### Professors

Stanley Chodorow, Ph.D., *Dean of Arts and Humanities*  
Joseph W. Esherick, Ph.D., *Hsiu Professor of Chinese Studies*  
David Noel Freedman, Ph.D., *Endowed Chair, Biblical Studies*  
David M. Goodblatt, Ph.D.  
Ramón A. Gutierrez, Ph.D.  
Steven Hahn, Ph.D.  
Judith M. Hughes, Ph.D.  
Allan Mitchell, Ph.D.  
Alden Mosshammer, Ph.D., *Chair*  
Michael E. Parrish, Ph.D.  
Paul G. Pickowicz, Ph.D.  
Edward Reynolds, Ph.D.  
David R. Ringrose, Ph.D.  
Robert C. Ritchie, Ph.D.  
Martin J. S. Rudwick, Ph.D.  
Eric Van Young, Ph.D.  
Robert S. Westman, Ph.D.

### Associate Professors

Michael A. Bernstein, Ph.D., *Vice-Chair*  
Robert S. Edelman, Ph.D.  
Robert Marc Friedman, Ph.D.  
Rachel Klein, Ph.D.  
David S. Luft, Ph.D.  
John A. Marino, Ph.D.  
Michael P. Monteón, Ph.D.

### Assistant Professors

William F. Deverell, Ph.D.  
David G. Gutierrez, Ph.D.  
Christine Hunefeldt, Ph.D.  
Hasan Kayali, Ph.D.  
Dorothy Y. Ko, Ph.D.  
Stephanie McCurry, Ph.D.

Michael Meranze, Ph.D.  
William H. Propp, Ph.D.  
Pamela B. Radcliff, Ph.D.  
Julie Saville, Ph.D.  
Cynthia Truant, Ph.D.

### Lecturer with Security of Employment

Ping Hu

### Adjunct Faculty

Michal Belknap, Ph.D., *Professor, Cal. Western School of Law*  
Amy Bridges, Ph.D., *Associate Professor, Political Science*  
Paul Drake, Ph.D., *Professor, Political Science*  
Steve Erie, Ph.D., *Associate Professor, Political Science*  
Peter Smith, Ph.D., *Professor, Political Science*  
Leften Stavrianos, Ph.D., *Professor Emeritus, Clark University*

### Emeriti Professors

Guillermo Céspedes, Ph.D.  
John S. Galbraith, Ph.D.  
H. Stuart Hughes, Ph.D.  
Gabriel Jackson, Ph.D.  
Thomas A. Metzger, Ph.D.  
Earl Pomeroy, Ph.D.  
Ramón Eduardo Ruiz, Ph.D.

## THE UNDERGRADUATE MAJOR

"Whereas other subjects may make us smarter for next time," said the great historian of the Renaissance, Jakob Burckhardt, "the study of history makes us wiser forever." This major is, moreover, an excellent preparation for a number of rewarding careers in law, government, diplomacy, international business, education, and even medicine. At the crossroads of the humanities, the arts, and the social sciences, history is the study of human experience as it has unfolded over the ages. As an academic discipline it presents a unique gateway both to the richness of our cultural heritage and to the immense variety of world civilizations.

Students wishing to declare a major in history should first consult with the departmental coordinator of student advising and registration (CSAR). After determining the student's likely field of emphasis, the CSAR will then assign him or her to an appropriate faculty adviser. In consultation with this academic adviser, the student should select a coherent program of history courses that will lead to completion of the major. All undergraduate majors are required to consult with the academic adviser at least once each quarter, during a designated advising period, and to obtain written approval for the selection of courses for the quarter following. Any difficulties

in the advising procedure or in registration formalities should be reported to the CSAR, Professor Michael Bernstein, phone 534-1070.

The fields are as follows: Africa (HIAF), East Asia (HIEA), Europe (HIEU), History of Science (HISC), Latin America (HILA), Near East (HINE), and U.S. History (HIUS).

Basic requirements for the major are as follows:

1. A three-quarter lower-division sequence.
2. Seven courses in a field of emphasis. (In certain cases, with approval of the academic adviser, two of these courses may be in a neighboring discipline.)
3. Five courses in other fields within the department, selected to complement the student's concentration.

Three of the twelve upper-division courses must be chronologically situated before 1800. These courses are indicated by the symbol (+).

In special cases, upon approval of the academic adviser, students may devise a field of emphasis (e.g., economic, legal, or social history) other than those designated above.

Lower-division sequences may be selected from the following:

- HILD 2 A-B-C United States History
- HILD 3 A-B-C European Society and Social Thought
- HILD 7 A-B-C Race and Ethnicity in the U.S.A.
- HILD 10-11-12 East Asia

Students may also satisfy the lower-division requirement for the major by completing the Revelle College Humanities sequence or the Fifth College sequence, "Making of the Modern World." Students entering with AP credit in history may waive part of the lower-division requirements. Transfer students, after consulting with their academic adviser, may petition to substitute a two-semester or three-quarter survey from another school for the department's lower-division requirement.

## THE HONORS PROGRAM

The department offers a special program for outstanding students. Candidates for history honors are chosen during the spring quarter from among juniors in history who have taken at least four upper-division courses in the department. Juniors with a 3.5 GPA in history (3.0 overall) are eligible to apply. Admission to the program is based on the student's academic record and the recommendation of professors familiar with the student's work. Interested candidates should complete the application form

(available in the Department of History office) prior to April 15.

In addition to regular course work in the department, the honors program consists of a colloquium in historiography offered in the fall quarter of the senior year and a program of independent study leading to the completion of an honors essay on a topic of the student's choice. During the fall quarter of the senior year, candidates select a topic and begin preliminary work on the honors essay in consultation with a major field adviser (HITO 194). During the winter quarter the student pursues a course of independent study devoted to the completion of the honors essay (HITO 195). The award of history honors is based on satisfactory completion of the colloquium in history and the honors essay. Students are expected to maintain an average of 3.5 or better in all work taken within the department. Honors candidates must include at least three colloquia in their regular course work.

Candidates for history honors should organize their work as follows:

1. Six quarter-courses in one of the major fields offered by the department, of which two or three should be colloquia;
2. Three quarter-courses in a field other than the primary one, of which one course should be a colloquium unless the requirement of three colloquia has been satisfied in the major field;
3. HITO 196. Colloquium in History;
4. HITO 194 and 195. History Honors—Honors Essay.

## MINORS IN HISTORY

The minor consists of at least six courses, of which no more than three may be lower-division. Although there is no specific distribution requirement, the courses should be selected to constitute a coherent curriculum. Prospective minors in history should consult with a departmental adviser for approval of their program.

## EDUCATION AT HOME PROGRAM (EHP)

In the winter quarter 1993, the UCR campus will continue the Education at Home Program (EHP) for those students with special interest in early American history and culture. Those selected for participation in this program will spend nine weeks in Williamsburg, one in Philadelphia, and a concluding week in Washington, D.C. *This program is open to all undergraduates from any campus in the UC system. With the prior approval of their graduate adviser, graduate students may also apply.* Registration (through the Riverside campus) will be made for the fol-

lowing three courses in the Department of History: 157, 158, and 159. Special arrangements for additional independent study (maximum of four units) may be made with the student's home campus. For further information, brochures, or application forms, call Susan Braddock at (714) 787-3820. Preference is given to applications received by June 30; final application deadline is November 1.

## THE GRADUATE PROGRAM

### THE MASTER'S PROGRAM

The Department of History offers master's degrees in the fields of Chinese studies, modern European history (1500 to the present), Latin American history, and United States history. The department also provides the opportunity for students to design special M.A. programs in areas such as African history, East Asian history, medieval European history, history of science, and Judaic studies. In consultation with an appropriate faculty member, students may petition the department for approval for a special M.A.

Applicants must submit their academic records, three letters of recommendation, Graduate Record Examination scores (aptitude only), TOEFL scores for foreign applicants, and samples of their written work. Ordinarily, those admitted have at least a 3.0 grade-point average, with a higher average in history and related subjects. Proficiency in a foreign language is not a requirement for admission (except in Latin America, where a reading knowledge of Spanish is required), but the department urges prospective applicants to begin study of at least one foreign language relevant to the proposed area of concentration as early as possible in their academic careers.

Students wishing information regarding the possibility of part-time M.A. study should consult the department's graduate coordinator. The deadline for application is January 15. Normally, master's students do not receive financial aid from the department or the university, except in circumstances where funds are not utilized for support of Ph.D. candidates.

### GENERAL REQUIREMENTS

Candidates for the master's degree are expected to finish the program in one academic year of full-time study or two years of part-time work. The program requires completion of thirty-six units, of which at least twenty units must be in colloquia, seminars, or independent study courses. Master's students may enroll in a research seminar offered for Ph.D. students with

the permission of the instructor. In addition to course requirements, students must pass a comprehensive oral examination. Students in European or Latin American history and in certain special areas must demonstrate reading knowledge of at least one foreign language relevant to their course work.

### AREA OF CONCENTRATION: CHINESE STUDIES

Chinese studies is an interdisciplinary program that allows the graduate student interested in China to take advantage of the university's offerings in various departments to build a coordinated graduate program leading to an M.A. degree. Although the program is offered under the auspices of the Department of History (and the degree will be an M.A. in Chinese history), it is an interdisciplinary program, permitting the student to select courses in political science, sociology, literature, anthropology, linguistics, and language as well as history.

### AREA OF CONCENTRATION: EUROPE

Candidates for the M.A. degree in European history pursue a program concentrating on the history of modern Europe. The program provides background in earlier European history in order to place modern Europe in perspective. Some training in a discipline other than history is also recommended. The requirement of nine courses (thirty-six units) is normally distributed as follows:

1. A two-quarter research seminar, to be selected from HIGR 230, 231, or 232.
  2. A set of three one-quarter courses concerning the historical literature about central problems in European history: HIGR 220, 221, and 222.
  3. Two courses in preindustrial Europe, 1450–1750: HIGR 220 and 221 may be counted for this distribution requirement.
  4. Two courses in industrial Europe, since 1750: HIGR 221, 222 may be counted for this requirement.
- NOTE: HIGR 221 may NOT be used for both (3) and (4).
5. One course in a discipline other than history, if relevant to the student's program.

### AREA OF CONCENTRATION: LATIN AMERICA

This program offers the student a general preparation in the history of Latin America. Students will have the opportunity to specialize in national or colonial periods, and can emphasize

work in one country. Advanced work in another discipline related to Latin America may also be included in the program. Thirty-six units normally should be distributed as follows:

1. HIGR 245A-B-C.
2. Three graduate courses in Latin American history.
3. Three other courses related to Latin America in history or in other disciplines.

**AREA OF CONCENTRATION:  
UNITED STATES**

This area of concentration offers the M.A. candidate a broad grounding in the literature of American history from the colonial period to the present. In addition to a shared core of courses, students specialize in a topical field of their own choosing. Training in a related discipline outside of history is encouraged. The requirement of nine courses (thirty-six units) is ordinarily distributed as follows:

1. HIGR 265A-B-C. The Literature of American History. These colloquia are required of all entering graduate students in American history.
2. Two courses in a single topical field—social and cultural history, economic history, legal and constitutional history, political history, history of the South, history of the West, history of the borderlands and Southwest, African-American history, Chicano history, and history of women and gender.
3. Four additional courses chosen in consultation with the student's adviser. Two of these may be in a related field outside the department.
4. At least six of the nine courses must be colloquia or graduate-level courses. Students may take directed readings, research seminars, or the 250 series to meet this requirement.

**PH.D. PROGRAM**

**ADMISSION**

The Department of History offers the doctor of philosophy degree in the fields of ancient history, East Asian history, European history, history of science, Latin American history, and United States history.

Applicants for admission to these programs must submit their academic records, three letters of recommendation, Graduate Record Examination scores (aptitude only), TOEFL scores for foreign applicants, and samples of their written work. The minimum grade-point average for admission is 3.0, with a higher average in history and related subjects. Proficiency in a foreign language is not a requirement for admission (except in Latin Amer-

ica, where a reading knowledge of Spanish is required), but the department urges prospective applicants to begin study of at least one foreign language relevant to the proposed area of concentration as early as possible in their academic careers. With very few exceptions, students are expected to begin their programs in the fall quarter. The deadline for application is January 15.

**FIELDS OF STUDY**

During the first year of residence each student, after consulting with a graduate adviser in the area of concentration, selects one major field of study and two minor fields. Within a major field the student should indicate a special interest from which the dissertation may develop. The first minor is ordinarily a supplementary field within the student's area of concentration, while the second minor is a complementary field outside the area of concentration. The basic programs of study are as follows:

**I. ANCIENT HISTORY**

Students in ancient history will be expected to demonstrate a broad mastery of the entire field, with special concentration as follows:

- A. Major Fields
  1. The ancient Near East, with emphasis on the civilization of the northwest Semitic peoples during the Bronze and early Iron Ages.
  2. The history of Israel in the biblical period.
  3. The history of the Jewish people in antiquity.
  4. The department hopes to be able to add Greek and Roman history as a major field within the near future.
- B. First Minor
  1. One of the fields listed above not chosen as the major field.
  2. Greek and Roman history.
  3. The Middle East before Islam (western Asia and northeastern Africa from the sixth century b.c.e. to the seventh century c.e.).
- C. Second Minor
  1. A field of history outside of ancient history.
  2. An ancillary discipline outside the field of history.
- D. Language Requirements
  1. All students will be expected to demonstrate a reading knowledge of two modern foreign languages, usually French and German. This requirement may be satisfied by any of the means recognized by the department.

2. All students will be expected to demonstrate a reading knowledge of at least one and usually two of the three following ancient languages: Greek, Hebrew, and Latin. The languages will be chosen as appropriate to the student's particular interests, and the requirement will be satisfied by departmental examination.
3. The second and sometimes the third language not elected under (2) may be required if necessary for the student's research. Additional languages, such as Akkadian, Aramaic, Egyptian, Ugaritic, Phoenician, and middle and modern Hebrew, are available through the department and may be required as necessary for the student's research. The required level of competence will be set as appropriate to the student's needs, and the requirement will be satisfied by departmental examination.

**II. EAST ASIAN HISTORY**

Students in East Asian history will be expected to demonstrate a broad competence in the entire field, with special concentration as follows:

- A. Major Fields
  1. Modern China
  2. Modern Japan
- B. First and Second Minor Field
 

The first and second minor will ordinarily be the premodern history of the East Asian country chosen for the major field, and the modern history of the country *not* chosen for the major field. That is, students specializing in modern China will do minor fields in premodern China and modern Japan; students specializing in modern Japan do minors in premodern Japan and modern China. Specifying these two minors is designed to train Ph.D.s for the type of jobs that are available: that is, it is typical for East Asian history professors to be asked to teach survey courses covering modern East Asian (including both China and Japan) or national history courses covering the entire period of Chinese or Japanese history.
- C. Third Minor Field
 

The function of the third minor is to broaden the student's perspective on East Asian history through one of two types of supplementary work:

  1. A history field outside of East Asia.
  2. A related discipline (e.g., anthropology, sociology or literature) which will

be studied with particular attention to East Asia.

D. Language Requirements

All students must demonstrate a reading knowledge of one East Asian language and a reading knowledge of a second foreign language related to the student's research interests. Language competencies will be examined through a timed translation exercise (with the use of a dictionary).

**III. EUROPEAN HISTORY**

The graduate program in European history is designed to achieve a dual objective: to encourage a broad mastery of historical methods and literature in various fields, as well as to develop a special focus of research within a single area or epoch. The distribution of offerings is as follows:

A. Major Fields

1. Modern Europe, with a specialty in Britain, Spain, France, Germany, Italy, social history, economic history, diplomatic history, or intellectual history.
2. Early modern Europe, with a specialty in the social and economic history of one region.
3. Medieval Europe, with a specialty in political theory, canon law, or the political history of the eleventh-thirteenth centuries.

B. First Minor

Any of the following fields may be selected provided that the study concentrates on a chronological period outside the major.

1. Classical Greece and Rome
2. Medieval Europe
3. Early modern Europe
4. Modern Europe
5. A national history

C. Second Minor

1. A geographic area outside of Western Europe
2. History of science
3. Women's history
4. A related discipline, offered through another department.

D. Language Requirements

The department requires Ph.D. candidates in European history to demonstrate competency in two languages in addition to English before advancement to candidacy.

**IV. HISTORY OF SCIENCE**

NOTE: Students should indicate whether they are also applicants for admission to the interdepartmental program in Science Studies (history, sociology, and philosophy of science).

A. Major Fields

1. Science in early modern Europe.
2. Science in the eighteenth and nineteenth centuries.
3. Science in the twentieth century.
4. Another field of comparable breadth, defined in consultation with the major field adviser.

B. First and Second Minor Fields (Any two of the following may be selected, in consultation with the major field adviser.)

1. Science Studies (Mandatory for students in the Science Studies program.)
2. Any of the other fields offered by the department, provided that it offers general historical understanding of the same period as the major field.
3. A field of history of science not chosen as the major field.
4. A second field of history, provided that it concentrates on a period or region other than that chosen under (2) above.
5. A related discipline, offered through another department; this may be in one of the sciences.

C. Language Requirements

Competency in one or two languages in addition to English before advancement to candidacy. Requirement will vary depending on chosen major field.

**V. LATIN AMERICAN HISTORY**

Doctoral candidates in Latin American history are expected to gain a broad chronological and geographical mastery of the field as a whole. Candidates should include in their studies Mexico, Cuba and Central America, the Andean region, and the Southern Cone countries in both the colonial and the national periods. Students will normally choose either the colonial or national period as a major field and the other as the first minor. The oral examination in the major field, while concentrating on the student's special areas of interest, will be a comprehensive examination covering the whole field of Latin American history.

A. Major Fields

1. The national period of Latin America, with a specialty in Mexico, Cuba, the Andean Republics or Southern Cone countries.
2. Colonial Latin America, with an emphasis on one major region.

B. First Minor

The student should select either the national period or the colonial period as a chronological supplement to the major.

C. Second Minor

1. Another geographic area, or
2. An area of discipline related to the student's dissertation or preparation for university teaching.

D. Language Requirement

Competency in one language in addition to English before advancement to candidacy.

**VI. UNITED STATES HISTORY**

A. Major Fields

1. Colonial and National period to 1877.
2. Modern America, 1877 to the present.

B. First Minor

1. One of the above fields not chosen as the major field, or
2. One of the following topical fields: social and cultural history, economic history, legal and constitutional history, political history, history of the South, history of the borderlands and Southwest, African-American history, Chicano history, history of women and gender.

C. Second Minor

1. A geographic area outside the United States in either the premodern or modern period
2. A related discipline

D. Language Requirement

Competency in one language in addition to English before advancement to candidacy.

**VII. OTHER FIELDS**

Students may be admitted to graduate study leading to the Ph.D. in fields other than those listed above upon the recommendation of an appropriate faculty member. In such cases, a special program of study appropriate to the field will be devised by the major field adviser, subject to the approval of the department's graduate committee.

Note: The department also offers graduate work in African history. When appropriate, students may select minor fields in this area.

**EXAMINATIONS**

Ph.D. candidates must take at least one minor field examination by the spring of their second year and complete all examinations by May of their third year. Minor field examinations are written; that for the major field is a two-hour oral examination. In a minor field, a reading list is agreed upon, at least three months in advance, by the student and faculty member administering the minor field examination. The professor com-



poses and grades the written examination. For the major field, students should provide members of the examining committee, at least one week before the examination, with copies of a list of books that they have read in their major.

Students who wish to delay completion of their examinations beyond the fall quarter of the third year must petition the Graduate Committee for an exception. Students who fail either their major or minor field examinations may petition the Graduate Committee for permission to repeat it at any time during the following two quarters. A second failure results in automatic dismissal.

An M.A. degree may be awarded to continuing Ph.D. students on one of the following bases:

1. Successful completion of the qualifying examinations for the Ph.D.
2. Completion of the course work equivalent to that required for the M.A. (including a graduate seminar) and an oral examination.

Note: Students who wish to receive an M.A. must apply for candidacy during the first two weeks of the quarter in which they expect to receive their degree.

### DISSERTATION

Upon completion of the examinations and advancement to candidacy, the student writes a dissertation under supervision of a professor. The dissertation must be completed no later than six years from the beginning of the program. Normally, the dissertation should not exceed 250 pages, notes included. The student will defend the thesis before a doctoral committee composed of five or six professors, of which three are members of the history faculty.

The various requirements noted above apply to students who have done no previous graduate work in history. If a candidate has completed some graduate work before entering UCSD, there may be appropriate adjustments in the course work. Nevertheless, all candidates are expected to meet language requirements, to pass field examinations, to complete a dissertation, and to defend the thesis.

### DEPARTMENTAL PH.D. TIME LIMIT POLICIES

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed seven years. Total registered time at UCSD cannot exceed eight years.

### PH.D. AND M.A. LANGUAGE REQUIREMENTS

1. Ph.D. candidates in ancient, East Asian, and European history must demonstrate competence

in two foreign languages. Ph.D. candidates in history of science, Latin American history and United States history, and M.A. candidates in European or Latin American history must demonstrate competence in one foreign language. Additional languages appropriate to the special field of study may be required by the Graduate Committee, in consultation with the student's major field adviser. Language requirements for candidates in fields other than ancient history, East Asian history, European history, history of science, Latin American history, or United States history will be set by the Graduate Committee, in consultation with the student's major-field adviser.

2. Students may satisfy the foreign language requirement in any of the following ways:

- A. By achieving, for Ph.D. candidates, a score of 600 or better in one language and 550 or better in a second language, if required, and for M.A. candidates a score of 550 or better on the Graduate School Foreign Language Test (GSFLT) administered by the Educational Testing Service;
- B. By passing a proficiency examination administered by the Department of Linguistics, with a score of 30 or better.
- C. By completing with a grade of B — or better in each term a two-year, lower-division sequence in the language approved by the Graduate Committee;
- D. By completing with a grade of B — or better in each term a one-year, upper-division sequence in the language approved by the Graduate Committee;
- E. For languages not covered by the GSFLT program or the Department of Linguistics' examination, the requirement may be satisfied either by options B or C or by passing a special examination in the language which shall be administered by the Graduate Committee. NOTE: with reference to options C and D, such sequence must have been completed within two years of the time that request is made to the Graduate Committee for certification of competence. Courses may have been taken either at UCSD or, with the approval of the Graduate Committee, at another institution.

Where required, students must pass at least one foreign language examination by the end of the first year of study. Failure to meet this requirement is grounds for dismissal from the program. Students may not take the first minor field examination before completing one language requirement. No student may take the oral qualifying examination before completing all language requirements.

### COURSE WORK

A normal full-time program consists of twelve units per quarter. A maximum of four units may be in apprentice teaching. Students are expected to complete the following minimum of formal courses prior to their examinations: two two-quarter research seminars and eight colloquia or directed reading courses. Under certain circumstances, when appropriate colloquia are not available, students may substitute upper-division undergraduate courses for colloquia in the minor fields, with extra study required. Students are encouraged to take at least one colloquium or research seminar in their major field during the initial year of graduate study.

### PART-TIME STUDY

Students who enroll in fewer than twelve graduate or upper-division units per quarter are considered part-time students. Part-time study may be pursued in several master's programs and a few Ph.D. programs at UCSD. Approval for individual students to enroll on a part-time basis may be given for reasons of occupation, family responsibilities, or health. Individuals who are interested in part-time study and meet the above qualifications should inquire of the department about opportunities for part-time study.

Part-time students must satisfy the same admission requirements as full-time students and are eligible, at the discretion of the department, for 25 percent time teaching or research assistantships. Students who are approved by the dean of Graduate Studies and Research for enrollment in a program of half-time study or less (maximum of six units) may be eligible for a reduction in fees. All other students pay the same fees as full-time students.

### APPRENTICE TEACHING AND RESEARCH

As preparation for an academic career, Ph.D. candidates in history are encouraged to serve as teaching assistants. In certain cases, a student may instead participate in some special research program.

### FINANCIAL SUPPORT

Upon recommendation of the department, several types of financial aid are available to graduate students: full or partial remission of fees and tuition, fellowships, research assistantships, teaching assistantships, and readerships. Graduate students are eligible for one or a combination of five forms of financial support. Departmental policy has been to seek seven years of support for students in the program. Recent reduction in resources now makes it difficult to give assur-



ances for more than five years. Fellowships and research assistantships are granted by the Office of Graduate Studies and Research on the recommendation of the Graduate Committee. Teaching assistants are appointed by the department on the recommendation of the Graduate Committee. Readers are appointed by the department upon recommendation of the professor for whose course the student wishes to read. Students should, therefore, apply directly to the professor concerned. Appointments are not renewed automatically but are approved by the department on a yearly basis. The Office of Graduate Studies and Research grants partial remission of fees for nine quarters after advancement to candidacy ("normative time") if the student is advanced to candidacy by the end of the third year. (If the student delays advancement, the amount of normative time is reduced accordingly.) Upon expiration of normative time the student must complete the dissertation or resume full payment of fees.

## Courses

### LOWER DIVISION

#### HILD 2A-B-C. United States

A year-long lower-division course that will provide students with a background in United States history from colonial times to the present, concentrating on social, economic, and political developments. (Satisfies Muir College humanities requirement and American History and Institutions requirement.) Staff

#### HILD 3A-B-C. European Society and Social Thought

An examination by lectures and discussions of European social development and social theory from the later medieval period to the twentieth century. Important writings will be considered both as responses to and as provocations for social change in Europe. (Satisfies Muir College humanities requirements and the Revelle College additional humanities requirement.)

#### HILD 7A-B-C. Race and Ethnicity in the United States

Lectures and discussions surveying the topics of race, slavery, demographic patterns, ethnic variety, rural and urban life in the U.S.A., with special focus on European, Asian, and Mexican immigration.

#### HILD 7A. Race and Ethnicity in the United States (4)

A lecture-discussion course on the comparative ethnic history of the United States. Of central concern will be slavery, race, oppression, mass migrations, ethnicity, city life in industrial America, and power and protest in modern America. Saville

#### HILD 7B. Race and Ethnicity in the United States (4)

A lecture-discussion course on the comparative ethnic history of the United States. Of central concern will be the Asian-American and white ethnic groups, race, oppression, mass migrations, ethnicity, city life in industrial America, and power and protest in modern America. McCurry

#### HILD 7C. Race and Ethnicity in the United States (4)

A lecture-discussion course on the comparative ethnic history of the United States. Of central concern will be the Mexican-American, race, oppression, mass migrations, ethnicity, city life

in industrial America, and power and protest in modern America. Gutierrez

#### HILD 10-11-12. East Asia

A lower-division survey that compares and contrasts the development of China and Japan from ancient times to the present. Themes include the nature of traditional East Asian society and culture, East Asian responses to political and economic challenges posed by an industrialized West, and war, revolution and modernization in the twentieth century.

#### HILD 10. East Asia: The Great Tradition (4)

Examines the evolving characteristics of East Asian culture and civilization before 1600. Contrasts the rise of imperial Confucian governance in China to the development of feudal society in Japan. Pickowicz, Esherick, and Ko.

#### HILD 11. East Asia and the West (4)

Compares Chinese and Japanese responses to Western imperialism after 1600, focusing on popular protest and dynastic decline in China and the rise of the modernizing nation state in Japan. Pickowicz, Esherick, and Ko.

#### HILD 12. Twentieth-Century East Asia (4)

Deals with the rise of East Asia in the Pacific Century. This course stresses the emergence of a regionally dominant Japan before and after World War II and examines the process of revolution and state-building in China during the Nationalist and Communist eras. Pickowicz, Esherick, and Ko.

## UPPER DIVISION

### ■ AFRICA

#### Lecture Courses

#### HIAF 110. History of Africa to 1880 (4)

(Cross-listed as Third World Studies 175A.) A survey of pre-colonial Africa, concentrating on ancient Africa, Islam, state formation, the slave trade and abolition, and European penetration of the interior. Reynolds. + (Formerly Hist. 175A.)

#### HIAF 111. Modern Africa Since 1880 (4)

(Cross-listed as Third World Studies 175B.) A survey of African history dealing with the European scramble for territory, primary resistance movements, the rise of nationalism and the response of metropolitan powers, the transfer of power, self-rule and military coups, and the quest for identity and unity. Reynolds (Formerly Hist. 175B.)

#### HIAF 120. History of South Africa (4)

(Cross-listed as Third World Studies 176.) The origins and the interaction between the peoples of South Africa. Special attention will be devoted to industrial development, urbanization, African and Afrikaner nationalism, and the origin and development of apartheid and its consequences. Reynolds (Formerly Hist. 176.)

#### HIAF 130. African Society and the Slave Trade (4)

(Cross-listed as Ethnic Studies 169.) Topics include trans-Saharan trade, slavery with African societies, Atlantic slave trade, East African slave trade, problems of numbers exported and profitability, impact of slave trade on African society, and the abolition of the slave trade. Reynolds (Formerly Hist. 177.)

#### HIAF 140. Economic History of Africa (4)

(Cross-listed as Third World Studies 178.) Lecture-discussion course on the economic development of sub-Saharan Africa from earliest times to the present. Topics will include: pre-European trade, the Atlantic slave trade, the era of legitimate trade, economic imperialism and the colonial economy, and post-independence economic development. Reynolds + (Formerly Hist. 178.)

### Colloquia

The following courses are available to both undergraduate and graduate students. Undergraduates must receive a departmental stamp or permission of the instructor to register for the course. Requirements for each course will differ for undergraduate, M.A., and Ph.D. students.

#### HIAF 160/260. Special Topics in the Economic History of Africa (4)

Will examine selected topics in African economic history. Topics will include the precolonial economy, economics of colonialism, economics of underdevelopment, and postcolonial economic development. Special topics will vary from year to year. Department stamp required. *Prerequisites: completion of several upper-division history courses.* Reynolds (Formerly Hist. 177Q.)

#### HIAF 161/261. Special Topics in African History (4)

This colloquium is intended for students with sufficient background in African history. Topics, which vary from year to year, will include traditional political, economic, and religious systems, and theory and practice of indirect rule, decolonization, African socialism, and pan-Africanism. *Department stamp required.* Reynolds (Formerly Hist. 178Q.)

#### HIAF 199. Independent Study in African History (4)

Directed readings for undergraduates. *Prerequisite: consent of instructor and academic adviser required.*

### ■ EAST ASIA

#### Lecture Courses

#### HIEA 110. Ancient Japan and the Courtly Society (4)

From earliest times through the twelfth century. Subjects covered include the origins of the Japanese, ancient myth cycles and religious beliefs, the introduction of Buddhism and Chinese thought, and the brilliant "world of the shining prince." *Prerequisite: upper-division standing or consent of instructor.* Staff (Formerly Hist. 180A.)

#### HIEA 111. Japan in the Age of the Samurai (4)

Covers from the twelfth to mid-nineteenth centuries. Topics include the rise and fall of the warrior class, the nature of feudal institutions, and value systems ranging from popular religion to Zen and the "way of the warrior." Open to all students. Staff (Formerly Hist. 180B.)

#### HIEA 112. Japan's Emergence as a Modern State (4)

Covers Japan's tumultuous "modern century," from the opening to the West and overthrow of the feudal regime in the mid-1800s, through rapid Westernization and industrialization, culminating in aggression abroad and defeat in World War II. Staff (Formerly Hist. 180C.)

#### HIEA 113. Pearl Harbor and Hiroshima: World War II in Asia (4)

Addresses the conflict in Asia from 1931 to 1945, with particular attention to the global order, the war in Japanese eyes, ideological and racial aspects of the conflict, and the legacies of the war to postwar Japan and Asia. Staff (Formerly Hist. 180D.)

#### HIEA 114. Occupied Japan and the Cold War in Asia (4)

Focuses on the dramatic allied (largely U.S.) occupation of Japan from 1945 to 1952, with attention to both "reform and reconstruction" within Japan and the emergence of Japan as America's leading cold-war ally in Asia. Staff (Formerly Hist. 180E.)

#### HIEA 120. The History of Chinese Thought and Society: The Ancient Imperial Period (4)

This course deals with the genesis of Chinese thought and institutions in Shang and Chou times as well as Han political structure and thought. + (Formerly Hist. 181A.)

**HIEA 121. History of Chinese Thought and Society: The Middle Imperial Period (4)**

This course deals with the decline of the Han empire, the rise of Buddhism, the transformation of Chinese society in T'ang and Sung times, and the beginnings of Neo-Confucianism. *Prerequisite: HIEA 120 or consent of instructor.* + (Formerly Hist. 181B.)

**HIEA 122. History of Chinese Thought and Society: The Late Imperial Period (4)**

This course deals with the economic, political, and intellectual development of China during the five hundred years before the impact of the West. *Prerequisite: HIEA 120 or HIEA 121 or consent of instructor.* + (Formerly Hist. 181C.)

**HIEA 130. History of the Modern Chinese Revolution: 1800-1911 (4)**

This course stresses the major social, political, and intellectual problems of China in the period from the Opium War to the Revolution of 1911. Special emphasis is placed on the nature of traditional Chinese society and values, the impact of Western imperialism and popular rebellion on the traditional order, reform movements, and the origins of the early revolutionary movement. Pickowicz (Formerly Hist. 182.)

**HIEA 131. History of the Modern Chinese Revolution: 1911-1949 (4)**

This course deals with the formative period of the twentieth-century Chinese revolution. Considerable stress is placed on the iconoclastic New Culture period, the rise of the student movement, Chinese communism, the labor movement, revolutionary nationalism, and the emergence of the peasant movement. Pickowicz (Formerly Hist. 183.)

**HIEA 132. History of the People's Republic of China (4)**

This course analyzes the history of the PRC from 1949 to the present. Special emphasis is placed on the problem of post-revolutionary institutionalization, the role of ideology, the tension between city and countryside, Maoism, the Great Leap Forward, the Cultural Revolution. Pickowicz (Formerly Hist. 184.)

**Colloquia**

The following courses are available to both undergraduate and graduate students. Undergraduates must receive a departmental stamp or permission of the instructor to register for the course. Requirements for each course will differ for undergraduate, M.A., and Ph.D. students.

**HIEA 160/260. Colloquium on Modern Japanese History (4)**

This colloquium examines controversial domestic and international issues in Japanese history from 1850 to recent times. Topics will vary from year to year. (Formerly Hist. 180Q.)

**HIEA 162/262. History of Women in China (4)**

This course concerns women in Chinese history in Imperial times. The course will focus on women's changing roles in the family, society, and culture. Topics will vary from year to year. Ko

**HIEA 163/263. Cinema and Society in Twentieth-Century China (4)**

This colloquium will explore the relationship between cinema and society in twentieth-century China. The emphasis will be on the social, political, and cultural impact of film-making. The specific period under examination (1930s, 1940s, post-1949) may vary with each quarter. Topics may vary from year to year. *Prerequisite: previous course work in Chinese history or equivalent.* Pickowicz (Formerly Hist. 183Q.)

**HIEA 164/264. Women and Family in Chinese History (4)**

This course concerns women and family in Chinese history. Topics will vary from year to year. *Prerequisites: upper-division standing. Department stamp required.* Ko

**HIEA 165/265. The Chinese Village in Transition: 1930-1956 (4)**

A research colloquium that examines social, economic, political, and cultural conditions in North China villages during Nationalist rule, World War II, the Civil War, and the early years of communist rule. *Prerequisites: completion of several upper-division history courses.* Pickowicz (Formerly Hist. 185Q.)

**HIEA 166/266. Self and Society in Modern Chinese Thought (4)**

This course examines the confluence of traditional and modern ways of thought in China, dealing with revolutionary, liberal, and conservative trends in the twentieth century and with their relationships to traditional orientations. (Formerly Hist. 186Q.)

**HIEA 167/267. Special Topics in Modern Chinese History (4)**

This seminar examines controversial, domestic, and international issues in Chinese history from 1800 to recent times. Esherick

**HIEA 168/268. Chinese Thought from Chou through Sung (4)**

This course will deal with both literary and intellectual tendencies and will be designed around student interests in subjects such as Chou Confucianism, Maoism, Taoism, legalism, and eclecticism; the rise of imperial Confucianism; Buddhist thought; Neo-Confucian thought; and Sung humanism. (Formerly Hist. 188Q.)

**HIEA 169/269. Literature and Society in Republican China (4)**

A colloquium that examines the relationship between literature and society in the 1911-1949 period. Novels, short stories, critical essays, and feature-length films are used to document the social, political, and intellectual history of the Republican era. *Prerequisites: completion of several upper-division history courses.* Pickowicz (Formerly Hist. 189Q.)

**HIEA 199. Independent Study in East Asian History (4)**

Directed reading for undergraduates under the supervision of various faculty members. *Prerequisite: consent of instructor and academic adviser required.* Staff

■ **EUROPE**

**Lecture Courses**

**HIEU 100. Early Greece (4)**

The social, political, and cultural history of the ancient Greek world from the Bronze Age to the Persian Wars (2000-480 B.C.). Mosshammer + (Formerly Hist. 101A.)

**HIEU 101. Greece in the Classical Age (4)**

The social, political, and cultural history of the ancient Greek world from the Persian Wars to the death of Alexander the Great (480-323 B.C.). Mosshammer + (Formerly Hist. 101B.)

**HIEU 102. The Roman Republic (4)**

The political, economic, and intellectual history of the Roman world from the foundation of Rome to the time of Julius Caesar. Mosshammer + (Formerly Hist. 102A.)

**HIEU 103. The Roman Empire (4)**

The political, economic, and intellectual history of the Roman world from the time of Julius Caesar to the death of Constantine. Mosshammer + (Formerly Hist. 102B.)

**HIEU 105. The Early Christian Church (4)**

A study of the origin and development of early Christian thought, literature, and institutions from the New Testament period to the Council of Chalcedon (451). Mosshammer +

**HIEU 108. Early Medieval England (4)**

Course covers the history of England from Roman times to 1066. Students will study the development of English govern-

ment, society, and culture. Chodorow + (Formerly Hist. 103A.)

**HIEU 109. Medieval England (4)**

Course covers the history of England from 1066 to the fourteenth century. Students will study the development of English government, society, and culture. *Prerequisite: Humanities sequence or its equivalent/consent of instructor.* Chodorow + (Formerly Hist. 103B.)

**HIEU 110. The Rise of Europe (4)**

The development of European society and culture from the decline of the Roman Empire to 1050. *Prerequisite: Humanities sequence or its equivalent.* Chodorow + (Formerly Hist. 104A.)

**HIEU 111. Europe in the Middle Ages (4)**

The development of European society and culture from 1050 to 1400. *Prerequisite: Humanities sequence or its equivalent.* Chodorow + (Formerly Hist. 104B.)

**HIEU 112. The Origins of the Common Law (4)**

Course begins with a discussion of the revival of jurisprudence in the twelfth century and then focuses on three areas of the early common law. First, we will cover the court system and its procedure. Second, we will study proprietary and possessory actions in property law. Third, we will discuss the origins of modern contract law. Chodorow + (Formerly Hist. 129.)

**HIEU 120. Early Renaissance Italy: Dante to the Medici (1300-1494) (4)**

The economic and political transformation of late-medieval Italy from the heyday of mercantile expansion before the plague to the dissolution of the Italian state system with the French invasions of 1494. Special focus upon family, associational life, and factionalism in the city; the development of the techniques of capitalist accumulation; and the spread of humanism. Marino + (Formerly Hist. 105A.)

**HIEU 121. Late Italian Renaissance: From Machiavelli to Galileo (4)**

The political analysis of Machiavelli and Guicciardini establishes the lines of inquiry to examine society and culture in Italy from the High Renaissance to the seventeenth century. Marino + (Formerly Hist. 105B.)

**HIEU 123. Renaissance Europe (4)**

This course explores the age of the Renaissance from approximately the middle of the fourteenth century to the middle of the sixteenth (1350-1550) as a period of great change and diversity, a dynamic moment of discovery, exploration, and expansion, not only in geography but also in politics, economics, religion, art, and science. Marino + (Formerly Hist. 105C.)

**HIEU 124. The City in Italy (4)**

Each of the great Italian cities has a style and heritage all its own. This course considers the social, political, economic, and religious aspects of civic life which gave rise to the unique characteristics of such cities as Florence, Siena, Venice, or Rome. Emphasis will be placed on the function and content of civic art, the architecture of public buildings, and the design of the urban environment. The specific content of the course, the city or cities and periods under consideration, will vary. Marino + (Formerly Hist. 105D.)

**HIEU 125. Reformation Europe (4)**

The intellectual and social history of the Reformation and Counter-Reformation from the French invasions to the Edict of Nantes. Emphasis is upon reform from below and above, the transformation of grass-roots spirituality into institutional control. *Prerequisite: upper-division standing or consent of instructor.* Marino + (Formerly Hist. 106A.)

**HIEU 126. Age of Expansion: Europe and the World, 1400-1600 (4)**

Course will begin with a survey of the major empires of the fifteenth century, concentrating on the links between them. It will

then examine the entrance of Europeans on the global scene in the sixteenth century. This part of the course will examine European/non-European encounters, focusing on perceptions, economic interaction, and institutional adaptation and will emphasize the Hispanic American, Ottoman, and Indian Ocean cases. Ringrose and Marino + (Formerly Hist. 130A.)

**HIEU 127. Age of Expansion: Europe and the World, 1600–1750 (4)**

The techniques, economic organization, and institutional evolution of European colonizations in Africa, the Far East, and the Americas. The great geographical discoveries and the beginnings of world trade, with emphasis on comparative aspects from 1600–1750. *Prerequisite: upper-division standing.* Ritchie, Marino + (Formerly Hist. 130B.)

**HIEU 128. Tudor History (4)**

This course will examine the social, political, and cultural history of England from 1485 to 1660. *Prerequisite: upper-division standing.* Ritchie +

**HIEU 130. Europe in the Eighteenth Century (4)**

A lecture-discussion course focusing on Europe from 1688–1789. Emphasis is on the social, cultural, and intellectual history of France, Germany, and England. Topics considered will include family life, urban and rural production and unrest, the poor, absolutism, and the Enlightenment from Voltaire to Rousseau. *Prerequisite: upper-division standing.* Truant + (Formerly Hist. 107.)

**HIEU 131. The French Revolution: 1789–1814 (4)**

A lecture and discussion course dealing with the Revolution in France and its impact throughout Europe. Among the topics considered will be the origins of the Revolution, the birth of popular radicalism, the nature of the Terror and Robespierre and the impact of the Napoleonic Wars on England, Germany, and Italy. *Prerequisite: upper-division standing.* Truant + (Formerly Hist. 108.)

**HIEU 132. German Politics and Culture: 1648–1848 (4)**

A lecture-discussion course on the political and cultural history of Germany in the early modern period. Luft + (Formerly Hist. 118.)

**HIEU 133. Lord and Peasant—East and West: Agrarian Revolution (4)**

A comparative treatment of the transformation from a feudal to capitalist base of the rural life and economy of East and West Europe. Edelman (Formerly Hist. 116.)

**HIEU 134. Russia: Ninth Century to 1855 (4)**

The roots of Russian backwardness. The long-range historical impact of dominant personalities (Ivan the Terrible, Peter the Great, Catherine the Great) will be assessed. *Prerequisite: upper-division standing or consent of instructor.* Edelman + (Formerly Hist. 110A.)

**HIEU 135. European Economy and Society: 1000–1750**

Underlying structures of rural economy and society, geography, population, resources, technology. Evolution of commercial cities, unification of the European market systems, mercantilism, emergence of bureaucracies. Economic and social background of the industrial revolution. *Prerequisite: upper-division standing or consent of instructor.* Ringrose + (Formerly Hist. 112A.)

**HIEU 136. Europe 1870–1945 (4)**

A lecture-discussion course dealing with major problems of European history, 1870–1945, and investigating the special character of Europe's crisis of modernization. The course will emphasize the impact of the second industrial revolution, the crisis of socialism, the emergence of fascism, and the two world wars.

**HIEU 137. British Empire Since 1840 (4)**

The political and economic development of the British empire, including the evolution of colonial nationalism, the develop-

ment of the commonwealth idea, and changes in British colonial policy. *Prerequisite: upper-division standing or consent of instructor.* Galbraith (Formerly Hist. 131A-B.)

**HIEU 138. Imperial Spain, 1476–1808 (4)**

The rise and decline of Spain's European empire from Ferdinand and Isabella to 1700. The revival of Spain and her return to European affairs in the eighteenth century. *Prerequisite: upper-division standing or graduate standing.* Ringrose + (Formerly Hist. 135A.)

**HIEU 139. History of Canada (4)**

A survey of the growth of Canada into a modern state from its beginnings under the French and British colonial empires. Galbraith

**HIEU 140. The Industrialization of Europe: 1750–Present (4)**

The beginning of industrialization in England and its spread through nineteenth-century Europe. World War I and the redefinition of economy: private enterprise vs. social justice, big business vs. state planning, and environmental limitations on "progress." *Prerequisite: upper-division standing or consent of instructor.* Ringrose (Formerly Hist. 112B.)

**HIEU 141. European Diplomatic History, 1870–1945 (4)**

The European alliance to the outbreak of the First World War. The postwar settlement and its breakdown. The advent of Hitler and the disarray of the Western democracies. The Second World War and the emergence of the super powers. J.M. Hughes (Formerly History 113)

**HIEU 142. European Intellectual History, 1780–1870 (4)**

European thought from the late Enlightenment and the French Revolution to Marx and Baudelaire, emphasizing the origins of romanticism, idealism, and positivism in England, Germany, and France. *Prerequisite: upper-division standing or consent of instructor.* Luft (Formerly Hist. 114.)

**HIEU 143. European Intellectual History, 1870–1945 (4)**

A lecture-discussion course on the crisis of bourgeois culture, the redefinition of Marxist ideology, and the transformation of modern social theory. Readings will include Nietzsche, Sorel, Weber, Freud, and Musil. (This course satisfies the minor in the Humanities Program.) *Prerequisite: upper-division standing.* Luft (Formerly Hist. 119.)

**HIEU 144. Social and Cultural History of Europe since 1945 (4)**

Europe in the post-European world. The failure of the wartime Resistance. The restoration of bourgeois society. Economic boom and uncertainty. The new role of meritocracy, labor unions, and public enterprise. Population shifts and the problems of women and foreign workers. Neorealism, existentialism, and the German and Russian cultural revivals. Protest and liberation in Eastern Europe. The European Economic Community. The end of the Cold War. *Prerequisite: upper-division standing.* H.S. Hughes (Formerly Hist. 124.)

**HIEU 145. European Jewry: 1750–1880 (4)**

The era of the emancipation of European Jews with an emphasis on social history and history of ideas. *Prerequisite: upper-division standing or consent of instructor.* Staff

**HIEU 146. Fascism, Communism, and the Crisis of Liberal Democracy: Europe 1919–1945 (4)**

A consideration of the political, social, and cultural crisis that faced Western liberal democracies in the interwar period, with emphasis on the mass movements that opposed bourgeois liberalism from both the left and the right. Radcliff

**HIEU 147. The History of Women in Europe: Middle Ages to the Industrial Revolution (4)**

The course deals with changes in women's roles, status, and sexual taboos from the beginning of the Middle Ages to 1789.

HIEU 147 is not a prerequisite to HIEU 148. *Prerequisite: upper-division standing.* Truant + (Formerly Hist. 128A.)

**HIEU 148. The History of Women in Europe: Industrial Revolution to the Present (4)**

This course covers the history of women from the Industrial Revolution to the present, focusing on the role of women in radical political movements, the evolution of women's work and feminism. HIEU 147 is not a prerequisite to HIEU 148. *Prerequisite: upper-division standing or consent of instructor.* Truant (Formerly Hist. 128B.)

**HIEU 149. History of Women in Europe: 1870 to the Present (4)**

This course explores the history of women across classes from 1870 to the present, with an emphasis on the variety of women's experience and the efforts towards and obstacles to empowerment. Topics include: women and the state, science and gender, feminist movements and the evolution of women's work. *Prerequisite: upper-division standing.* Radcliff

**HIEU 150. Modern British History (4)**

Emphasis on changes in social structure and corresponding shifts in political power. The expansion and the end of empire. Two World Wars and the erosion of economic leadership. *Prerequisite: upper-division standing or consent of instructor.* J. M. Hughes (Formerly Hist. 122.)

**HIEU 151. Spain since 1808 (4)**

Social, political, cultural history of Spain since Napoleon. Features second Spanish Republic, the Civil War, Franco era, and transition to democracy. *Prerequisite: upper-division standing.* Ringrose (Formerly Hist. 135B.)

**HIEU 152. Italy Since 1860 (4)**

Political and social history since the unification, treated primarily in terms of the successive attempts of parliamentary monarchy, fascism, Christian democracy, and communism to cope with such basic issues as church-state relations, the problem of the South, uneven economic development, and the cleavages within Italian society. *Prerequisite: upper-division standing or consent of instructor.* H. S. Hughes (Formerly Hist. 125.)

**HIEU 153. Modern French History (4)**

A lecture-discussion course on the political and social history of France during the nineteenth and twentieth centuries. *Prerequisite: upper-division standing or consent of instructor.* Mitchell (Formerly Hist. 120.)

**HIEU 154. Modern German History (4)**

A lecture-discussion course on the political and social history of Germany during the nineteenth and twentieth centuries. *Prerequisite: upper-division standing or consent of instructor.* Mitchell (Formerly Hist. 121.)

**HIEU 155. Modern Austria (4)**

The political, social, and intellectual history of Austria from Maria Theresa to the First Republic, with special emphasis on the crisis of liberal culture in the late nineteenth century. *Prerequisite: upper-division standing or consent of instructor.* Luft (Formerly Hist. 126.)

**HIEU 156. Russia: 1855 to the Present (4)**

The long-term causes of the Revolution and its ultimate consequences. Course will consider the roles of Herzen, Lenin, Stalin, and Nicholas and Alexandra. HIEU 134 is not a prerequisite for HIEU 156. *Prerequisite: upper-division standing or consent of instructor.* Edelman (Formerly Hist. 110B.)

**HIEU 157. Early Soviet Social History (4)**

This course will stress the class struggle and the construction of socialism in Russia between the Revolution and World War II. The fate of the peasants and workers will be stressed. Other topics covered will be revolutionary culture, women's liberation, the national question, and the social basis of bureaucracy. *Prerequisite: upper-division standing or consent of instructor.* Edelman (Formerly Hist. 171.)

**Colloquia**

The following courses are available to both undergraduate and graduate students. Undergraduates must receive a departmental stamp or permission of the instructor to register for the course. Requirements for each course will differ for undergraduate, M.A., and Ph.D. students.

**HIEU 160/260. Alexander the Great and the Hellenistic World (4)**

A study of the conquests of Alexander, with special attention to the interpretation of the legends surrounding his career and to the transformation of culture in the world ruled by his successors. Mosshammer + (Formerly Hist. 101Q.)

**HIEU 161/261. The Decline of Rome (4)**

This course offers an in-depth study of the later Roman Empire from the death of Marcus Aurelius (180) to the disintegration of the empire in the West. Attention is focused on the Germanic invasions, cultural differentiation between East and West, and the Christian transformation of the Roman world. Mosshammer + (Formerly Hist. 102Q.)

**HIEU 162/262. Special Topics in the History of Early Christianity (4)**

Selected topics in the history of the early Christian church from New Testament times to the middle of the fifth century. Topics will vary from year to year. Mosshammer + (Formerly Hist. 132Q.)

**HIEU 163/263. Special Topics in Medieval History (4)**

Intensive study of special problems or periods in the history of medieval Europe. Topics vary from year to year, and students may therefore repeat the course for credit. *Prerequisite: background in European history.* Chodorow + (Formerly Hist. 104Q.)

**HIEU 164/264. Special Topics in Early Modern Europe (4)**

Topics will vary from year to year, and students may therefore repeat the course for credit with the permission of the instructor. (Satisfies the Humanities Program minor.) Marino + (Formerly Hist. 105Q.)

**HIEU 165/265. Special Topics in Early Modern Spain (4)**

Readings and discussion of recent studies on Spain in the early modern period: the Hapsburg Empire to 1700, social and economic conditions of Spain in the Enlightenment of the eighteenth century, and the breakup of the Old Regime after 1790. *Prerequisite: background in European history.* Ringrose + (Formerly Hist. 134Q.)

**HIEU 166/266. The Agrarian Revolution in Western and Eastern Europe, 1300-1900 (4)**

Examines the transition from traditional to modern economy and society in rural Europe from the late medieval period to the turn of the twentieth century. Considerable attention will be paid to theoretical issues. Edelman + (Formerly Hist. 115Q.)

**HIEU 167/267. Special Topics in the Social History of Early Modern Europe (4)**

Topic varies from year to year. May be repeated for credit. Truant + (Formerly Hist. 116Q.)

**HIEU 168/268. Special Topics in European Economic History (4)**

Analysis of the economic and social interactions between cities and their surrounding regions, comparing the impact of political, commercial, and industrial urbanization in the historical development of regions and countries. Each student will study one such city and present his or her finding to the seminar. Ringrose + (Formerly Hist. 112Q.)

**HIEU 170/270. Special Topics in Nineteenth-Century Europe (4)**

This course alternates with HIEU 171. Topics will vary from year to year. *Prerequisite: background in European history.* Mitchell (Formerly Hist. 120Q.)

**HIEU 171/271. Special Topics in Twentieth-Century Europe (4)**

This course alternates with HIEU 170. Topics will vary from year to year. *Prerequisite: background in European history.* Mitchell (Formerly Hist. 121Q.)

**HIEU 172/272. War in the Twentieth Century (4)**

Reckonings by novelists, essayists, and biographers with the phenomenon of contemporary warfare as an unprecedented experience and an abiding threat. J. M. Hughes (Formerly Hist. 113Q.)

**HIEU 173/273. Ideology and the Imagination in Modern Britain (4)**

Culture and society as reflected in novels and essays. *Prerequisite: background in European history.* J. M. Hughes (Formerly Hist. 122Q.)

**HIEU 175/275. Selected Topics in the History of Nineteenth- and Twentieth-Century Spain (4)**

Topics may include economic development, modernization, political change, intellectual history, and the transition to democracy. Ringrose (Formerly Hist. 130Q.)

**HIEU 176/276. German Thought in the Romantic Era: 1780-1830 (4)**

Works of Kant, Schiller, Schelling, Schlegel, and Hegel will be read. (Satisfies the Humanities Program minor.) Luft (Formerly Hist. 118Q.)

**HIEU 177/277. Special Topics in Modern German Thought (4)**

Topics will vary from year to year. (Satisfies the Humanities Program minor.) *Prerequisite: background in European history.* Luft (Formerly Hist. 119Q.)

**HIEU 178/278. Special Topics in Modern Russian History (4)**

Topics will vary from year to year. May be repeated for credit. Edelman (Formerly Hist. 110Q.)

**HIEU 180/280. Topics in European Women's History (4)**

The specific content of the course will vary from year to year, but will always analyze in depth a limited number of issues in European women's history. Radcliff

**HIEU 199. Independent Study in European History (4)**

Directed readings for undergraduates under the supervision of various faculty members. *Prerequisite: consent of instructor and faculty adviser required.* Staff

**■ HISTORY OF SCIENCE**

**Lecture Courses**

**HISC 100. The Discovery of Prehuman Time and History (4)**

The emerging knowledge of the vast scale of the past history of the natural world and the consequent dwarfing of human history, from the chronologies of the seventeenth century to the planetary histories and radiometric dating of the twentieth. *Prerequisite: upper-division standing.* Rudwick (Formerly Hist. 194.)

**HISC 101. Problems in the Cultural History of Greek, Medieval, and Early Modern Science (4)**

An examination of the sciences produced by Greek, late medieval, and early modern European cultures. The origins of Greek naturalism; Aristotelian and Platonic philosophies of nature; medieval university culture; Aristotle's medieval critics; theology and the medieval scientific imagination; Renaissance sci-

entific patronage; the revolution in printing; artisan and craft traditions; early modern scientific thinkers in medieval perspective: Copernicus, Paracelsus, Giordano Bruno, Kepler, Galileo and Descartes. *Prerequisite: upper-division standing.* Westman + (Formerly Hist. 168.)

**HISC 103. Gender and Science in Historical Perspective (4)**

This course will examine the history of women's struggles and strategies for access and equality in professional science. Questions related to gender bias in science—as a social institution and as an epistemological enterprise—will be addressed in light of the historical and biographical readings. R.M. Friedman

**HISC 105. History of Environmentalism (4)**

History of human effects on the natural environment, and with environmentalist interpretations of the history of science. R.M. Friedman

**HISC 106. The Scientific Revolution (4)**

A cultural history of the formation of early modern science in the sixteenth and seventeenth centuries: the social forms of scientific life; the construction and meaning of the new cosmologies from Copernicus to Newton; the science of politics and the politics of science; the origins of experimental practice; how Sir Isaac Newton restored law and order to the West. Westman

**HISC 107. The Emergence of Modern Science**

The development of the modern conception of the sciences, and of the modern social and institutional structure of scientific activity, chiefly in Europe, during the eighteenth and nineteenth centuries. *Prerequisite: upper-division standing.* Rudwick

**HISC 108. Science and Technology in the Twentieth Century. (4)**

The origins and development of the modern scientific-technological enterprise, with science in industry, government, and war. Cultural, social, and economic implications of major scientific advances. The changing social role of the scientist. *Prerequisite: upper-division standing.* Friedman

**Colloquia**

The following courses are available to both undergraduate and graduate students. Undergraduates must receive a departmental stamp or permission of the instructor to register for the course. Requirements for each course will differ for undergraduate, M.A., and Ph.D. students.

**HISC 160/260. Historical Approaches to the Study of Science (4)**

Major recent publications in the history of science will be discussed and analyzed; the topics will range in period from the seventeenth century to the twentieth, and will deal with all major branches of natural science. Special topics. Topics will vary from year to year. Rudwick (Formerly Hist. 131Q.)

**HISC 162/262. Problems in the History of Science and Religion (4)**

Intensive study of specific problems in the relation between science and religion. The problems may range in period from the Renaissance to the twentieth century. Topics vary from year to year, and students may therefore repeat the course for credit. Rudwick/Westman (Formerly Hist. 182Q.)

**HISC 163/263. Topics in the History of the Life and Earth Sciences (4)**

Intensive study of specific problems in the life sciences and earth sciences, ranging in period from the Renaissance to the twentieth century. Topics vary from year to year, and students may therefore repeat the course for credit. Rudwick (Formerly Hist. 192Q.)



**HISC 164/264. Topics in the History of the Physical Sciences**

Intensive study of specific problems in the physical (including chemical and mathematical) sciences, ranging in period from the Renaissance to the twentieth century. Topics vary from year to year, and students may therefore repeat the course for credit. R.M. Friedman

**HISC 166/266. Topics in the History of the Social Sciences (4)**

Intensive study of specific problems in the history of the social sciences in relation to the natural sciences and mathematics.

**HISC 199. Independent Study in the History of Science (4)**

Directed readings for undergraduates under the supervision of various faculty members. *Prerequisite: consent of instructor and academic adviser required.* Staff

**■ LATIN AMERICA****Lecture Courses****HILA 100. Colonial Latin America: Era of Conquest (4)**

The history of Latin America from 1400–1600. Lectures, reading, and discussion, with emphasis on the history of Spain and Portugal, the great pre-Columbian civilizations of the New World (Inca, Aztec, Maya), and the age of exploration and conquest. Van Young + (Formerly Hist. 140A.)

**HILA 101. Colonial Latin America: The Mature Colonies (4)**

The history of Latin America (including Brazil) from 1600 to 1825. Lectures, reading, and discussion, with topics including slavery, social life, the evolution of political institutions, imperial rivalries, and the nature of the independence movements at the beginning of the nineteenth century. *Prerequisite: upper-division standing or consent of instructor.* Van Young + (Formerly Hist. 140B.)

**HILA 102. Latin America in the Twentieth Century (4)**

This course surveys the history of the region by focusing on two interrelated phenomena: the absence of democracy in most nations and the region's economic dependence on more advanced countries, especially the United States. Among the topics discussed will be the Mexican Revolution, the military in politics, labor movements, the wars in Central America, liberation theology, and the current debt crisis. *Prerequisite: upper-division standing or consent of instructor.* Monteon (Formerly Hist. 140C.)

**HILA 105. South America: Labor, Coercion, and Society in the Nineteenth Century (4)**

Course examines how and why forms of forced labor, particularly slavery, persisted and changed in South America after independence and how they shaped the possibilities of economic development. An emphasis is placed on the diversity of contexts in which laborers survived. Hunefeldt

**HILA 110. Progress and Poverty in South America: 1820–1930 (4)**

An examination of three phenomena on the continent: the expansion of centralized states, the boom-bust cycles of economic growth, and the persistence of mass misery. The course covers the "export" phase of development, 1820–1930. *Prerequisite: none, although an introductory sequence in history, political science, or economics is useful.* Monteon (Formerly Hist. 148A.)

**HILA 111. Progress and Poverty in South America: 1930–Present (4)**

An examination of three phenomena on the continent: the expansion of centralized states, the boom-bust cycles of economic growth, and the persistence of mass misery. The course covers industrialization and its consequences, 1930–present. Monteon (Formerly Hist. 148B.)

**HILA 112. Economic and Social History of the Andean Region (4)**

Study of the economic and social problems of the Andean region from the colonial period until the crisis of 1912, with special attention to theoretical models to explain the processes of change. Staff (Formerly Hist. 143C)

**HILA 113. Lord and Peasant in Latin America (4)**

Examination of the historical roots of population problems, social conflict, and revolution in Latin America, with emphasis on man/land relationships. Special emphasis on modern reform efforts and on Mexico, Cuba, Brazil, and Argentina. Lecture, discussion, reading, and films. *Prerequisite: upper-division standing or consent of instructor.* Van Young (Formerly Hist. 149.)

**HILA 114. Social History of Colonial Latin America (4)**

The course will examine the evolution of multiracial societies in Brazil and Spanish America, with some attention to the Anglo-American colonies by way of comparison. Particular emphasis on the relationship of race to class and on topics such as race mixture, agrarian structures, slavery, urban life, and crime and social protest. *Prerequisite: upper-division standing.* Van Young + (Formerly Hist. 141.)

**HILA 115. The Latin American City, a History (4)**

A survey of the development of urban forms of Latin America and of the role that cities played in the region as administrative and economic centers. After a brief survey of pre-Columbian centers, the lectures will trace the development of cities as outposts of the Iberian empires and as "city-states" that formed the nuclei of new nations after 1810. The course concentrates primarily on the cities of South America, but some references will be made to Mexico City. It ends with a discussion of modern social ills and Third World urbanization. Lima, Santiago de Chile, Buenos Aires, Rio de Janeiro, and Sao Paulo are its principal examples. *Prerequisite: upper-division standing.* Monteon

**HILA 117. Indians, Blacks, and Whites: Family Relations in Latin America (4)**

The development of family structures and relations among different ethnic groups. State and economy define and are defined by family relations. Thus this family approach also provides an understanding of broader socio-economic processes and cultural issues. Hunefeldt

**HILA 120. History of Argentina (4)**

A survey from the colonial period to the present, with an emphasis on the nineteenth and twentieth centuries. Among the topics covered: the expansion of the frontier, the creation of a cosmopolitan, predominately European culture, and the failure of industrialization to provide an economic basis for democracy. *Prerequisite: upper-division standing.* Monteon (Formerly Hist. 143A.)

**HILA 121. History of Brazil (4)**

From colonial times to the present, with an emphasis on the nineteenth and twentieth centuries. Among the topics covered: the evolution of a slave-based economy, the key differences among regions, the military in politics, and the creation of the most populous and industrialized country in Latin America. *Prerequisite: upper-division standing.* Monteon (Formerly Hist. 143B.)

**HILA 122. Cuba: From Colony to Socialist Republic (4)**

A lecture-discussion course on the historical roots of revolutionary Cuba, with special emphasis on the impact of the United States on the island's development and society. *Prerequisite: upper-division standing.* (Formerly Hist. 147.)

**HILA 131. A History of Mexico (4)**

A century of Mexican history, 1821–1924: the quest for political unity and economic solvency, the forging of a nationality, the Gilded Age and aftermath, the ambivalent Revolution of

Zapata and his enemies. *Prerequisite: upper-division standing or consent of instructor.* (Formerly Hist. 146A.)

**HILA 132. A History of Contemporary Mexico (4)**

The paradox of a conservative state as heir to a legendary social upheaval, with special emphasis on the mural art renaissance, the school crusade, the economic dilemma, and the failure to eradicate poverty and inequality. Lectures and discussion. *Prerequisite: upper-division standing or consent of instructor.* (Formerly Hist. 146B.)

**Colloquia**

The following courses are available to both undergraduate and graduate students. Undergraduates must receive a departmental stamp or permission of the instructor to register for the course. Requirements for each course will differ for undergraduate, M.A., and Ph.D. students.

**HILA 160/260. Topics in Latin American Colonial History, 1500–1820 (4)**

Topics will deal with the social, economic, and political history of the Spanish and Portuguese experience in the new world and the presence of the black and the Indian. *Prerequisite: background in Latin American history.* Staff + (Formerly Hist. 140Q.)

**HILA 161/261. History of Women in Latin America (4)**

A broad historical overview of Hispanic-American women's history focusing on issues of gender, sexuality, and the family as they relate to women, as well as the historiographical issues in Latin American and Chicana women's history. Gutierrez (Formerly Hist. 143G.)

**HILA 162/262. Special Topics in Latin American History (4)**

Topics will vary from year to year or quarter to quarter. May be repeated for an infinite number of times due to the nature of the content of the course always changing. Staff (Formerly Hist. 143Q.)

**HILA 164/264. The Political Economy of Argentina (4)**

The course surveys the basic issues in Argentina's development since the late eighteenth century, focusing on the relation of politics to economics and of both to the dramatic economic stagnation of the last fifty years. Each student will be required to write a paper on one of these topics, based on his or her reading of scholarly monographs and journals. Monteon (Formerly Hist. 144Q.)

**HILA 166/266. Cuba: From Colony to Socialist Republic (4)**

A colloquium on the historical roots of revolutionary Cuba, with special emphasis on the impact of the United States on the island's development and society. Ruiz (Formerly Hist. 147Q.)

**HILA 170/270. Topics in Latin American History, 1820–1910 (4)**

Topic will vary from year to year. May be repeated for credit. Ruiz (Formerly Hist. 146Q.)

**HILA 171/271. Special Topics in Latin American History since 1910 (4)**

Topic will vary from year to year. May be repeated for credit. Ruiz

**HILA 172/272. Machismo and Matriarchy: The Latin American Social Structure (4)**

The course will examine the social history of Latin America as the product of family structure and sexual mores. In addition to looking at the different settings in which the Latin American family evolved, the course will discuss the importance of miscegenation, the role of women, and the current social crisis of the region. Gutierrez (Formerly Hist. 145Q.)



## HISTORY

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### **HILA 199. Independent Study in Latin American History (4)**

Directed readings for undergraduates under the supervision of various faculty members. *Prerequisite: consent of instructor and academic adviser required.* Staff

### ■ **NEAR EAST**

#### **Lecture Courses**

### **HINE 100. The Ancient Near East and Israel (4)**

The history of Israel is studied in the context of ancient Near Eastern civilization as a whole. Topics include the birth of civilization in Southern Mesopotamia, the Assyrian and Babylonian empires, and the rise of Persia as well as Israel in the biblical period. *Prerequisite: upper-division standing or consent of instructor.* Staff + (Formerly Hist. 100.)

### **HINE 101. Hebrew Prophetic Literature (4)**

The prophetic books of the Bible in their historical contexts. The relationship between the prophetic and narrative books. Literary critical analysis, theological issues, reference to archaeological data. *Prerequisite: upper-division standing or consent of instructor.* D.N. Freedman + (Formerly Hist. 109.)

### **HINE 102. The Jews in Their Homeland in Antiquity (4)**

The Jews in Israel from the sixth century B.C.E. to the seventh century C.E. Statehood, nationalism, and autonomy within the framework of the Persian empire, the Hellenistic kingdoms, and the Roman-Byzantine empire. Cultural and religious developments. *Prerequisite: upper-division standing.* Goodblatt +

### **HINE 103. The Jewish Diaspora in Antiquity (4)**

The Jews outside their homeland in pre-Islamic times, concentrating on the Greco-Roman West and the Parthian-Sasanian East. Topics include assimilation and survival; antisemitism and missionizing; patterns of organization and autonomy; cultural and religious developments. *Prerequisite: upper-division standing.* Goodblatt +

### **HINE 104. The Bible and the Ancient Near East (4)**

The course deals with the Bible in terms of its relationship to the history of ancient Israel and the Near East. It focuses on the biblical prophets, their historicity, their message, and the influence of the events of their day on the prophecy. *Prerequisites: Revelle Humanities 1, HINE 100, Cultural Traditions 1A, or any other courses in Bible.* *Upper-division standing.* Freedman + (Formerly Hist. 137.)

### **HINE 108. The Middle East before Islam (4)**

The peoples, politics, and cultures of Southwest Asia and Egypt from the sixth century B.C.E. to the seventh century C.E. The Achaemenid Empire, the Ptolemaic and Seleucid kingdoms, the Roman Orient, the Parthian and Sasanian states. *Prerequisite: upper-division standing.* Goodblatt +

### **HINE 114. History of the Islamic Middle East**

A survey of the Middle East from the rise of Islam to the region's economic, political, and cultural integration into the West (mid-nineteenth century). Emphasis on socioeconomic and political change in the early Arab empires and the Ottoman state. Kayali

### **HINE 115. The Middle East since 1600 (4)**

Western Asia, Anatolia, and North Africa from 1600 to the present. The Ottoman Empire; European involvement; the rise of modern Turkey, Iran, the Arab states, and Israel. Political, cultural, and religious developments. Kayali

### **HINE 118. The Middle East in the Twentieth Century (4)**

An introduction to the history of the Middle East since 1914. Themes such as nationalism, imperialism, the oil revolution, and religious revivalism will be treated within a broad chronological and comparative framework drawing on the experience of selected countries. Kayali

### **Colloquia**

The following courses are available to both undergraduate and graduate students. Undergraduates must receive a departmental stamp or permission of the instructor to register for the course. Requirements for each course will differ for undergraduate, M.A., and Ph.D. students.

### **HINE 160/260. Special Topics in the Bible and Ancient Near East (4)**

The study of a single book, period, or issue in the Bible, in the context of the ancient Near Eastern world. *Prerequisite: department stamp required or consent of instructor.* Freedman + (Formerly Hist. 136.)

### **HINE 166/266. Nationalism in the Middle East (4)**

Examines the growth of nationalism and its ties to imperialism, religion, and revolution in nineteenth- and twentieth-century Middle East. An overview of the emergence of cultural and political ethnic consciousness in the broader context of the Ottoman state will be followed by a comparative study of Arab, Iranian, and Turkish nationalism as well as Zionism. *Department stamp required.* Kayali

### **HINE 170/270. Special Topics in Jewish History (4)**

This course studies a period or theme in Jewish history. Staff (Formerly Hist. 174.)

### **HINE 199. Independent Study in Near Eastern History (4)**

Directed readings for undergraduates under the supervision of various faculty members. *Prerequisite: consent of instructor and academic adviser required.* Staff

### ■ **UNITED STATES**

#### **Lecture Courses**

### **HIUS 100. Colonial Period to 1763 (4)**

Political and social history of the thirteen colonies: European background, settlement and expansion, beginnings of culture, and the imperial context. *Prerequisite: upper-division standing.* Ritchie + (Formerly Hist. 160.)

### **HIUS 101. The American Revolution (4)**

Causes and consequences of the revolution: intellectual and social change, the problems of the new nation, the Constitution, and the origins of political parties. *Prerequisite: upper-division standing.* Ritchie + (Formerly Hist. 161.)

### **HIUS 105. Thomas Jefferson and Early American History (4)**

This course will study Thomas Jefferson, both as an influential American in his own right and as a window onto the age of the American Revolution, the Enlightenment, and the early American Republic. Students will read both biographical materials and original documents to address various aspects of Jefferson's life and times. *Prerequisite: upper-division standing.* Staff + (Formerly Hist. 166.)

### **HIUS 107. The Early Republic (4)**

This course will examine the transformation of American society and politics between the American Revolution and the Jacksonian period. Topics to be considered include the emergence of domesticity, the development of political parties, the expansion of capitalist relations, the debate over slavery, the early labor movement, and the origins and motivations of middle-class reform. Meranze

### **HIUS 110. The Rise and Fall of the Old South (4)**

This course examines the history of the American South from first settlement to the Civil War. Special attention will be devoted to the emergence of slavery and the plantation system, the role of the South in the Revolution and Constitution, the relations between planters and yeomen, the development of slave

communities, and the growing sectional conflict. *Prerequisite: upper-division standing or consent of instructor.* Hahn (Formerly Hist. 153.)

### **HIUS 111. The Making of the New South (4)**

This course will focus on the American South between the Civil War and the civil rights movement. Topics include emancipation and Reconstruction, the new plantation system, agrarian radicalism, segregation and disfranchisement, the onset of industrialization, Southern culture black and white, and the recent struggles for civil and political rights. Hahn

### **HIUS 112. The Era of Civil War and Reconstruction (4)**

This course is chiefly a social and political history of the United States between 1848 and 1877. It explores the developing sectional conflict, disunion and civil war, and the process of reconstructing the nation; and it places the American experience in an international and comparative context. *Prerequisite: upper-division standing or consent of instructor.* Hahn (Formerly Hist. 172.)

### **HIUS 114. California History (4)**

This course examines California history from 1800 onward, with an emphasis on social, economic, and political change. The course will explore the effect of national and international events as well as the ways in which California—the ideal and the real—shapes the American experience. Deverell

### **HIUS 117. History of Los Angeles (4)**

This course examines the history of Los Angeles from the early nineteenth century to the present. Particular issues to be addressed include urbanization, ethnicity, politics, technological change, and cultural diversification. Deverell

### **HIUS 120. American Politics and Society, 1900–1942 (4)**

A lecture-discussion course on American politics and society from the era of Theodore Roosevelt to Pearl Harbor. Among the topics covered: the progressive movement, the impact of the Great War, the economic boom and collapse of the 1920s, and the New Deal. *Prerequisite: upper-division standing.* Parrish (Formerly Hist. 167A.)

### **HIUS 121. American Politics and Society, 1942–Present (4)**

A lecture-discussion course on American politics and society, Pearl Harbor to the present. Among the topics covered: the origins of the cold war, the Red scare, the civil rights movement, the counterculture of the 1960s, and the neoconservatism of the Nixon-Reagan era. *Prerequisite: upper-division standing.* Parrish (Formerly Hist. 167B.)

### **HIUS 122. American Foreign Relations to 1865 (4)**

The intellectual, economic, political, and social forces that shaped American policy and attitudes towards other countries from the colonial era through the Civil War. Topics include the revolution, the origins of neutrality, the Monroe Doctrine, continental expansionism, and the Civil War. Staff (Formerly Hist. 169A)

### **HIUS 123. American Foreign Relations, 1865–Present (4)**

The intellectual, economic, political, and social forces that shaped American policy and attitudes towards other countries since the Civil War. Topics include imperialism, the world wars, American-Soviet relations after 1945, the cold war, Vietnam, and contemporary developments. Staff (Formerly Hist. 169B)

### **HIUS 126. Power in American Society (4)**

(Cross-listed as Political Science 110J.) This course examines how power has been conceived and contested during the course of American history. The course explores the changes which have occurred in political rhetoric and strategies as America has moved from a relatively isolated agrarian and commercial republic to a military and industrial empire. Hahn, Strong (Formerly Hist. 123)

**HIUS 130. Cultural History from 1607 to the Civil War (4)**

This course will explore connections between American culture and the transformation of class relations, gender ideology, and political thought. Topics will include the transformation of religious perspectives and practices, republican art and architecture, artisan and working-class culture, the changing place of art and artists in American society, antebellum reform movements, antislavery and proslavery thought. *Prerequisite: upper-division standing or consent of instructor.* Klein (Formerly Hist. 151A.)

**HIUS 131. Cultural History from the Civil War to the Present (4)**

This course will focus on the transformation of work and leisure and the development of consumer culture. Students will consider connections between culture, class relations, gender ideology, and politics. Topics will include labor radicalism, Taylorism, the development of organized sports, the rise of department stores, the transformation of middle-class sexual morality, the growth of commercial entertainment, and the culture of the cold war. *Prerequisite: upper-division standing or consent of instructor.* Klein (Formerly Hist. 151B.)

**HIUS 135. Slavery and the Atlantic World (4)**

(Cross-listed with Ethnic Studies 170.) An examination of the emergence and consolidation of slave societies in regions of the Caribbean and British North America from the seventeenth century through the early nineteenth century. Saville (Formerly Hist. 159A.)

**HIUS 136. Slavery and Freedom in Nineteenth-Century U.S.: Images and Realities (4)**

(Cross-listed with Ethnic Studies 171.) An examination of social, cultural, and political dimensions of the transition from slave to wage labor in the era of the Civil War, Reconstruction, and the Gilded Age. Saville (Formerly Hist. 159B.)

**HIUS 139. The Social History of American Art and Architecture (4)**

A course exploring the historical relationship between the evolution of American society and culture and the development of painting, sculpture, and architecture. *Prerequisite: upper-division standing.* Ritchie (Formerly Hist. 165.)

**HIUS 146. Early American Labor History, 1600-1850 (4)**

A history of labor systems and activity in early America. The course will address work relations affecting Indians, slaves, artisans, indentured servants, laborers, yeomen, and tenant farmers as well as work culture, political consciousness, labor organization, and working-class protest. *Prerequisite: upper-division standing.* Staff (Formerly Hist. 164.)

**HIUS 148. The American City in the Twentieth Century (4)**

(Cross-listed as USP 103.) This course focuses on the phenomenon of modern American urbanization. Case studies of individual cities will help illustrate the social, political, and environmental consequences of rapid urban expansion, as well as the ways in which urban problems have been dealt with historically. Deverell

**HIUS 149. The United States in the 1960s (4)**

An overview of the social and political developments that polarized American society in the tumultuous decade of the 1960s. Themes include the social impact of the post-war "baby boom," the domestic and foreign policy implications of the Cold War; the evolution of the civil rights and women's movements; and the transformation of American popular culture. D. Gutierrez

**HIUS 150. American Legal History to 1865 (4)**

The history of American law and legal institutions. This quarter focuses on crime and punishment in the colonial era, the emer-

gence of theories of popular sovereignty, the forging of the Constitution and American federalism, the relationship between law and economic change, and the crisis of slavery and Union. *Prerequisite: upper-division standing.* Parrish (Formerly Hist. 154A.)

**HIUS 151. American Legal History since 1865 (4)**

The history of American law and legal institutions. This course examines race relations and law, the rise of big business, the origins of the modern welfare state during the Great Depression, the crisis of civil liberties produced by two world wars and McCarthyism, and the Constitutional revolution wrought by the Warren Court. HIUS 150 is not a prerequisite for HIUS 151. *Prerequisite: upper-division standing.* Parrish (Formerly Hist. 154B.)

**HIUS 152. The Trials of America (4)**

An in-depth look at the civil and criminal trials that have shaped the legal and constitutional history of the United States from the colonial period to the present. The relationship between law and society will be explored through a series of cases that examine freedom of the press, insanity and the law, impeachment, treason and sedition, and tort liability. *Prerequisite: upper-division standing or consent of instructor.* Parrish (Formerly Hist. 157.)

**HIUS 153. American Political Trials (4)**

Survey of politicized criminal trials and impeachments from Colonial times to the 1880s. Examines politically-motivated prosecutions and trials that became subjects of political controversy, were exploited by defendants for political purposes, or had their outcomes determined by political considerations. Parrish

**HIUS 154. Western Environmental History (4)**

(Cross-listed as USP 160.) This course examines human interaction with the western American environment and explores the distinction between the objective environmental understanding of science and the subjective views of history and historians. The course will also analyze the most compelling environmental issues in the contemporary West. Deverell

**HIUS 156. American Women, American Womanhood (4)**

This course explores the emergence of a dominant ideology of womanhood in America in the early nineteenth century and contrasts the ideal with the historically diverse experience of women of different races and classes, from settlement to 1870. Topics include witchcraft, evangelicalism, cult of domesticity, sexuality, rise of industrial capitalism and the transformation of women's work, Civil War, and the first feminist movement. *Prerequisite: upper-division standing.* McCurry

**HIUS 157. American Women, American Womanhood 1870 to Present**

This course explores the making of the ideology of womanhood in modern America and the diversity of American women's experience from 1870 to the present. Topics include the suffrage movement, the struggle for reproductive rights and the ERA; immigrant and working-class women, women's work, and labor organization; education, the modern feminist movement and the contemporary politics of reproduction, including abortion and surrogate motherhood. *Prerequisite: upper-division standing.* McCurry

**HIUS 158. Social and Economic History of the Southwest I (4)**

(Cross-listed as Ethnic Studies 130.) This course examines the history of the Spanish and Mexican borderlands (what became the U.S. Southwest) from roughly 1400 to the end of the U.S.-Mexico War in 1848, focusing specifically on the area's social, cultural, and political development. Gutierrez, R. (Formerly Hist. 155A)

**HIUS 159. Social and Economic History of the Southwest II (4)**

(Cross-listed as Ethnic Studies 131.) This course examines the history of the American Southwest from the U.S.-Mexican War in 1846-48 to the present, focusing on immigration, racial and ethnic conflict, and the growth of Chicano national identity. Gutierrez, R. (Formerly Hist. 155B.)

**Colloquia**

The following courses are available to both undergraduate and graduate students. Undergraduates must receive a departmental stamp or permission of the instructor to register for the course. Requirements for each course will differ for undergraduate, M.A., and Ph.D. students.

**HIUS 160/260. Industrialization and Early American Society (4)**

A course examining the initial stages of industrialization in the late eighteenth and early nineteenth centuries. Special attention to how various communities and trades responded to the intervention of large-scale capital, machine technology, and the rise of factory methods of production. (Formerly Hist. 154Q.)

**HIUS 161/261. Popular Politics and Political Culture in America, 1750-1900 (4)**

This course will examine the transformation of political life in America from the mid-eighteenth century to the turn of the twentieth century. We shall focus on three moments during these years: the revolutionary and constitutional period, the Jacksonian period, and the Gilded Age. And we shall look at the nature of popular political participation before the franchise, at the advent of mass politics and partisan mobilization, at the gendered aspects of politics and political culture, and at the rise of popular radicalism. Hahn

**HIUS 162/262. The American West (4)**

This seminar will trace major themes in the history of the American West. Topics will include ethnicity, the environment, urbanization, demographics, and shifting concepts surrounding the significance of the West. Graduate students will be required to submit additional written work in order to receive graduate credit for the course. Deverell (Formerly HIGR 263.)

**HIUS 163/263. The Transformation of the American City (4)**

This seminar will examine the transformation of American cities during the eighteenth and nineteenth centuries. Through discrete examinations of changing urban spatial patterns, the emergence of urban cultural institutions, political behavior, and the changing relationship of work and home, we will consider the problem of a truly urban community—of the opportunities for and limits to cultural and social interaction among classes and between men and women. Meranze (Formerly HIGR 259.)

**HIUS 164/264. American Slave Communities in Comparative Perspective (4)**

(Cross-listed as Ethnic Studies 181.) A reading and discussion seminar that explores topics related to the emergence, consolidation, and destruction of plantation slave regimes in regions of the Caribbean and the United States. Topics will vary. Saville (Formerly Hist. 164Q.)

**HIUS 165. Segregation, Freedom Movements, and the Crisis of the Twentieth Century (4)**

A reading and discussion seminar that views the origins of segregation and the social movements that challenged it between 1890 and 1970 in comparative framework. Saville

**HIUS 166/266. Topics in Southern History (4)**

Specific topics will vary from year to year, including slavery, Civil War and Reconstruction, the Afro-American experience, race relations. Hahn (Formerly Hist. 153Q.)

**HIUS 167/267. Topics in Mexican-American History (4)**  
(Cross-listed as Ethnic Studies 180.) This colloquium studies the racial representation of Mexican Americans in the United States from the nineteenth century to the present, examining critically the theories and methods of the humanities and social sciences. Gutierrez, R. (Formerly Hist. 155Q.)

**HIUS 169/269. Topics in American Legal and Constitutional History (4)**

A reading and discussion course on topics that vary from year to year, including American federalism, the history of civil liberties, and the Supreme Court. Parrish (Formerly HIGR 255.)

**HIUS 170/270. Topics in Colonial History (4)**

Colloquium on selected topics in late colonial history, with special attention to issues often neglected. Topics will vary from year to year, and the course may therefore be repeated for credit. + (Formerly Hist. 160Q)

**HIUS 171/271. Topics in the American Revolution (4)**

A colloquium dealing with special topics on the American Revolution and the formation of the United States. Themes will vary from year to year. Special topics. + (Formerly Hist. 161Q.)

**HIUS 172/272. Feminist Traditions in America (4)**

In this course original documents are used to explore competing definitions of feminism and the diversity of feminist traditions in the United States from the eighteenth century to the present day. Three arenas of feminist activity are considered—women's social and political activism, the female intellectual tradition, and feminist theory. Documents and topics change annually, so course may be repeated for credit. McCurry.

**HIUS 173/273. Topics in American Women's History (4)**

The specific content of the course will vary from year to year but will always analyze in depth a limited number of issues in American women's history. Special topics. McCurry (Formerly Hist. 163Q.)

**HIUS 174/274. American Society in the Cold War (4)**

An inquiry into the social, political, economic, and constitutional impact of the cold war upon American society between 1945 and the present. Parrish (Formerly Hist. 166Q.)

**HIUS 175/275. America in the 1930s (4)**

The impact of the Great Depression upon American society will be investigated in this reading and discussion course. Among the topics to be covered: the causes of the depression, the nature of the New Deal, political radicalism, popular culture, the arts and literature. Topics will vary from year to year. Parrish (Formerly Hist. 168Q.)

**HIUS 176/276. Topics in the History of American Radicalism (4)**

This course will explore America's radical tradition by focusing on sources of continuity and change among radical movements. Topics will include the Revolution, Abolitionism, labor radicalism, the women's movement, populism, the New Left, the counterculture. Topics will vary from year to year. Klein (Formerly Hist. 162Q.)

**HIUS 177/277. Gender and Sovereignty in the Age of Revolution (4)**

Intersection of gender and sovereignty in the Age of Democratic Revolution. Topics include relations between class, gender, the individual, and the states; changing definitions of masculinity and femininity; and women and revolution. Materials from England, France, and the United States. Meranze

**HIUS 178/278. American Labor in the Nineteenth Century (4)**

Readings in the comparative historiography of labor relations, working-class formation, slave emancipation, and industrialization in the United States during the nineteenth century. Compilation of annotated bibliographies and preparation of review essays. Saville

**HIUS 179/279. Topics in the History of Art and Politics, Nineteenth and Twentieth Centuries (4)**

This course explores the relationship between politics (broadly conceived) and painting. Focus will be on the United States, but readings will include works in European history. Klein

**HIUS 180/280. Immigration and Ethnicity in Modern American Society (4)**

Comparative study of immigration and ethnic-group formation in the United States from 1880 to the present. Topics include immigrant adaptation, competing theories which attempt to explain differences and similarities in the historical experiences of ethnic groups, and current debate over the persistence of ethnic attachments in modern American society. D. Gutierrez

**HIUS 181/281. Topics in Twentieth Century United States History (4)**

A colloquium dealing with special topics in U.S. history from 1900 to the present. Themes will vary from year to year. Parrish.

**HIUS 182/282. Special Topics in Intellectual History: Politics and Culture in the United States, 1776–1860 (4)**

An examination of the cultural and political construction of the American nation. Topics include: how citizenship and national community were imagined and contested; the importance of class, gender, and race in the nation's public sphere; and debates over slavery, expansion, and democracy in defining national purpose. Meranze

**HIUS 199. Independent Study in United States History (4)**

Directed readings for undergraduates under the supervision of various faculty members. *Prerequisite: consent of instructor and academic adviser required.* Staff

■ **TOPICS**

**Courses**

**HITO 100. Religious Traditions: Ancient Near Eastern Religions (4)**

A comprehensive study of the ancient religious traditions of the world. The course will cover tribal religions, classical polytheism, and the religion of the ancient Hebrews. *Prerequisite: upper-division standing.* Staff + (Formerly Hist. 179A.)

**HITO 101. Religious Traditions: Judaism, Christianity, Islam (4)**

A comprehensive study of the Western religious traditions. The course will cover Judaism, Christianity, and Islam. *Prerequisite: upper-division standing.* Staff + (Formerly Hist. 179B.)

**HITO 102. Religious Traditions: South and East Asian Religious Traditions (4)**

A comprehensive study of the Asian religious traditions. The course will cover Hinduism, Buddhism, Taoism, Shinto, and Confucian thought. *Prerequisite: upper-division standing.* Staff + (Formerly Hist. 179C.)

**HITO 112. The History of Psychoanalysis (4)**

A lecture-discussion course tracing the development of psychoanalysis. The late nineteenth-century intellectual context. Freud's major contributions. Psychoanalysis in practice. Post-Freudian transformations. *Prerequisite: upper-division standing or consent of instructor.* J.M. Hughes

**HITO 113. Architects, Clients, and the Public: 1550–1950 (4)**

From Michelangelo to Mies van der Rohe. Focus on Rome, Vienna, Paris, London, Washington, Chicago, New York. H.S. Hughes

**Colloquia**

The following courses are available to both undergraduate and graduate students. Under-

graduates must receive a departmental stamp or permission of the instructor to register for the course. Requirements for each course will differ for undergraduate, M.A., and Ph.D. students.

**HITO 161/261. The Rise of Capitalism (4)**

An inquiry into the theoretical issues and debates associated with the rise of capitalism as a world system between the fourteenth and nineteenth centuries. Authorities considered will include Karl Marx, Max Weber, Maurice Dobb, Immanuel Wallerstein, Eric Hobsbawm, Perry Anderson, Robert Brenner, Eugene Genovese, and Andre Gunder Frank. Hahn (Formerly Hist. 152Q.)

**HITO 162/262. Economic Development in Historical Perspective (4)**

An inquiry into economic growth and development as a process of historical transformation. Topics will vary from year to year, but some examples are: the transition from feudalism to capitalism in Europe and North America; the social and political tensions accompanying the rise of capitalism; the role of the state and the juridical environment in economic development; and the sources and organization of the managerial and financial control of enterprise. Bernstein

**HITO 163/263. Topics in the History of Economic Thought (4)**

A course focusing on the development of economic theory from its classical antecedents to the present day. Themes will vary from year to year, but some examples are: classical political economy, Marxian economic analysis, and the marginalist revolution. *Prerequisite: introductory economics or consent of instructor.* Bernstein

**HITO 194. History Honors (4)**

A program of independent study providing candidates for history honors an opportunity to develop, in consultation with an adviser, a preliminary proposal for the honors essay. An IP grade will be awarded at the end of this quarter. A final grade will be given for both quarters at the end of HITO 195. *Prerequisites: consent of instructor. Department stamp required.* Staff (Formerly Hist. 196A.)

**HITO 195. The Honors Essay (4)**

Independent study under the supervision of a faculty member leading to the preparation of an honors essay. A letter grade for both HITO 194 and 195 will be given at the completion of this quarter. *Prerequisite: consent of instructor. Department stamp required.* Staff (Formerly Hist. 196B.)

**HITO 196. Colloquium in History (4)**

The nature and uses of history are explored through the study of the historian's craft based on critical analysis of historical literature relating to selected topics of concern to all historians. Required of all candidates for history honors and open to other interested students with the instructor's consent. *Department stamp required.* Staff (Formerly Hist. 196Q.)

**HITO 197. Field Study (4)**

Program to be arranged between student and instructor, depending on student's needs and instructor's advice. Students are expected to produce substantial final papers on specific subjects described in student's proposals. To prepare such papers will require extensive research and writing. Will require bimonthly reports and one final paper. *Prerequisite: consent of instructor.* Staff (Formerly Hist. 197.)

**HITO 198. Directed Group Study (4)**

Directed group study on a topic not generally included in the regular curriculum. Students must make arrangements with individual faculty members. (P/NP grades only.) *Prerequisite: consent of instructor.* Staff (Formerly Hist. 198.)

**HITO 199. Independent Study for Undergraduates (4)**

Independent study on a topic not generally included in the regular curriculum. Students must make arrangements with indi-

vidual faculty members. (P/NP grades only.) *Prerequisites: upper-division standing and consent of instructor.* Staff (Formerly Hist. 199.)

## GRADUATE

Graduate standing is a prerequisite for all graduate-level courses.

### HIGR 200. History and Social Theory (4)

A weekly reading/writing seminar. Themes include historical sociology and large-scale history, interdisciplinary approaches to history (anthropological, psychoanalytic, etc.), and historical method. Students from all fields welcome, though emphasis primarily on early modern period (1500–1800).

### HIGR 206A-B. Seminar on West African History (4-4)

A two-quarter seminar on selected topics in West African history. One quarter will be devoted to readings and discussions, and the second quarter will be devoted to the writing of individual research papers. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. Reynolds

### HIGR 211A-B-C. Literature of Modern East Asian History (4-4-4)

This three-quarter sequence will introduce students to the monographic literature and the main historiographic controversies of modern East Asian history. Ordinarily, one quarter will focus on China, and one quarter on Japan, and one on comparative topics in Chinese and Japanese history. *Prerequisite: Graduate standing or permission of instructor.* Esherick

### HIGR 212. Sources on Modern Chinese History (4)

An introduction to Chinese documentary sources and collections on Qing and Republican History. This course will introduce students to the language of Qing documents, and to the contents and uses of imperial documents and archives, documentary collections, periodicals, gazetteers, etc. *Prerequisite: Graduate standing or permission of instructor.*

### HIGR 214A-B. Modern East Asian History (4-4)

A two-quarter research seminar in East Asian History. A paper, based on original research, due in the second quarter. Seminar topics will vary, with focus shifting from China to Japan in alternate years. Reading knowledge of Chinese or Japanese expected. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. Esherick

### HIGR 220. Problems in European History, 1500–1715 (4)

Introduction to the historiography of Renaissance, Reformation, and early modern Europe: an overview of methodologies with emphasis on sources and critical approaches. Required for all beginning European history graduate students. *Prerequisite: Graduate standing or permission of instructor.*

### HIGR 221. Problems in European History, 1715–1850 (4)

Selected topics in European history from the early modern to the modern era. Readings and discussions focus on issues of methodology and interpretation. Required for all beginning European history graduate students. *Prerequisite: Graduate standing or permission of instructor.*

### HIGR 222. Problems in European History, since 1850 (4)

Critical evaluation of selected topics in the period of modern Europe from the mid-nineteenth century to the present. Required for all beginning European history graduate students. *Prerequisite: Graduate standing or permission of instructor.*

### HIGR 223A-B. Seminar in Medieval History (4-4)

Topics will include the Investiture Contest, concentrating on the personalities involved in the ideas on both sides of the dispute,

and the study of the development of canonical jurisprudence, 1140–1234. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. Chodorow

### HIGR 224. Latin Paleography (4)

Course trains graduate students in the reading and study of medieval Latin manuscripts. Topics covered include codicology, paleography, and editing of texts. *Prerequisites: Latin and either French or German, and consent of the instructor.* Chodorow

### HIGR 225. Readings in Modern Russian History (4)

Students will read major works on Revolutionary Russia and Soviet history. Attention will be paid to both classic and revisionist works. Edelman

### HIGR 226. Knowledge and Meaning (4)

Readings in European intellectual history since the late nineteenth century. Previous work in intellectual history is required. May be repeated as course content changes. Luft

### HIGR 227A-B. Seminar in Spanish History (4-4)

Readings and critical analysis of selected topics and important works in the history of Spain. May be repeated as content changes. Proficiency in Spanish required to repeat course, but not for the first time taken. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. *Prerequisites: Fluent reading knowledge of Spanish desired. Graduate standing. German or French also desirable.* Ringrose

### HIGR 228A-B. Atlantic World in the 18th Century (1650–1825) (4-4)

This two-quarter research seminar will explore the interaction between Europe, Anglo-America, and Ibero-America. Discussion and papers will highlight the commercial growth of the eighteenth century, efforts at imperial control and reform, the emergence of autonomous regional identities, and the political transformation after 1770. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. *Prerequisite: HIGR 228A is a prerequisite for HIGR 228B.* May be taught by professors Ringrose, Marino, Van Young, and/or Meranze

### HIGR 229A-B. Seminar in British Empire History (4-4)

Topics on the history of the British Empire. May be repeated for credit. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter.

### HIGR 230A-B. Research Seminar in Early Modern Europe (4-4)

Selected topics in the period from the sixteenth century through the early nineteenth, with an emphasis on the theory and practice of socio-economic history. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. *Prerequisite: 230A is a prerequisite for 230B.*

### HIGR 231A-B. Research Seminar on Modern European Intellectual and Cultural History (4-4)

Selected topics in the period of the nineteenth and twentieth centuries. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. *Prerequisite: 231A is a prerequisite for 231B.*

### HIGR 232A-B. Research Seminar on Modern European Social and Political History (4-4)

Selected topics in the period of the nineteenth and twentieth centuries. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. *Prerequisite: 232A is a prerequisite for 232B.*

### HIGR 235A-B-C. Seminar in Science Studies (4-4-4)

(Cross listed as Sociology 255A-B-C and Philosophy 209A-B-C.)

A three-quarter sequence of readings and discussion, taught each quarter by a member of one of the departments (history, sociology, philosophy) participating in the graduate Science Studies Program. Required for all students in the program in their first year; those in later years are expected to audit this course, the content of which will change from year to year. An IP grade to be awarded the first and second quarters; final grade will not be given until the end of the third quarter.

### HIGR 236A-B. Seminar in History of Science (4-4)

A two-quarter research seminar comprising intensive study of a specific topic in the history of science. The first quarter will be devoted to readings and discussions; the second chiefly to the writing of individual research papers. Topics vary from year to year, and students may therefore repeat the course for credit. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter.

### HIGR 237. Topics in the History of Ocean Sciences (4)

(Cross-listed with SIO 201.) Intensive study of specific problems in the history of the ocean sciences, and of related earth and atmospheric sciences, in the modern period. Topics vary from year to year, and students may therefore repeat the course for credit. Rudwick/Friedman

### HIGR 245A-B-C. Seminar in the Literature of Latin American History (4-4-4)

Introduction to the literature of Latin American history. A three-quarter sequence of readings and discussions taught each quarter by members of the staff. Required for all beginning students for a graduate degree specializing in Latin American history; open and strongly recommended to other students using Latin American history as a secondary field for a graduate degree. HIGR 247A covers the colonial period, from conquest to independence to today; HIGR 247B covers South America from independence to today; HIGR 247C covers Mexico, Cuba, and Central America from independence to today. The three quarters need not be taken in sequence. Reading knowledge of Spanish is required.

### HIGR 246A-B. History of Mexico (4-4)

A research and study seminar of two quarters, with primary emphasis on social change in Mexico. The first quarter deals with primary sources, bibliography, and the selection of a research project; in the second quarter, the student will complete the project and submit the study to the scrutiny of the seminar. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. *Prerequisite: 240A is a prerequisite for 240B.*

### HIGR 247A-B. Readings and Seminar on Colonial Latin America (4-4)

A two-quarter course involving readings and research on sixteenth- through eighteenth-century Latin America. Students are expected to compose a paper based on original research that is due in the second quarter. Reading knowledge of Spanish required. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter.

### HIGR 248A-B. Readings and Seminar on Latin America, National Period (4-4)

A two-quarter course involving readings and research; the first quarter is devoted to the nineteenth and the second quarter to the twentieth century. Students are expected to compose a paper based on original research that is due in the second quarter. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. Reading knowledge of Spanish and/or Portuguese is helpful but not required.

### HIGR 249. Topics in Colonial Latin America (4)

One or two topics in colonial history will be analyzed in depth; reading knowledge of Spanish is expected.



## HUMANITIES

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### **HIGR 250. Topics in the National Period of Latin America (4)**

One or two topics in the national period or the national history of one country will be analyzed in depth; a reading knowledge of Spanish is expected.

### **HIGR 251. Topics in the History of Mexico (4)**

One or two topics in the history of Mexico will be examined in depth. A reading knowledge of Spanish is expected. Topics vary from year to year, and students may therefore repeat the course for credit. Ruiz

### **HIGR 255. The Literature of Ancient History (4)**

An introduction to the bibliography, methodology, and ancillary disciplines for the study of ancient history, together with readings and discussion on selected topics in the field. Topics vary from year to year. Mosshammer

### **HIGR 256. Topics in Greek and Roman History (4)**

An examination in depth of selected topics in Greek and Roman history. *Prerequisite: graduate standing or consent of instructor.* Mosshammer

### **HIGR 260A-B-C. Seminar in Judaic Studies (4-4-4)**

Weekly graduate seminar. Faculty and students present results of research. Student research may be towards course work on thesis.

### **HIGR 261. Seminar in the Hebrew Bible (4)**

Examination of texts from the Hebrew Bible with the aim of identifying their authors and the historical circumstances surrounding their composition. Methodological preparation in textual criticism, redaction criticism, and analysis of the relationship between history and literature.

### **HIGR 264. Topics in Pre-Islamic Jewish History (4)**

An examination in depth of selected topics in the history of the Jewish people and Jewish civilization in pre-Islamic times. Goodblatt

### **HIGR 265A-B-C. The Literature of American History (4-4-4)**

A three-quarter sequence of readings and discussions on the bibliographical and monographic literature of American history from the colonial period to the present. Taught by different members of the staff each quarter, the course is required of all beginning graduate students in American history.

### **HIGR 266A-B. United States History 1789-1877 (4-4)**

Analysis of sources and methods of historical research in the national period to 1877. Readings and original research papers will be required. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. Klein/Saville

### **HIGR 267A-B. Research Seminar in United States History (4-4)**

Readings and discussion in selected areas of American history for advanced graduate students. An IP (in progress) grade will be awarded the first quarter. The second quarter will be devoted to the presentation, discussion, and evaluation of work in progress. A final grade will be awarded at the end of the second quarter. *Prerequisite: 270A is a prerequisite for 270B.*

### **HIGR 269A-B. Topics in U.S. Diplomatic History (4-4)**

Critical analysis of major works in U.S. diplomatic history, designed to acquaint the student with the historiographic developments in the field. Readings, discussions, and papers will form the basis of the course. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter.

### **HIGR 270A-B. American Legal History (4-4)**

A two-quarter research seminar for graduate students focusing upon the development of American legal institutions and ideas from the colonial period to the present, with special emphasis

upon the relationship of law to public policy. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. Parrish

### **HIGR 272. Seminar in Southern History (4)**

Analysis of major works on the history of the southern United States, focusing on social groups, class and race relations, economic development, culture, and politics. An intercampus course taught jointly by participating faculty from UCSD, UCI, and UCR. May be repeated for credit due to the content changing from quarter to quarter. Special topics.

### **HIGR 273. The Culture of Consumption (4)**

(Cross-listed with COGR 240)

This course will explore the development and cultural manifestations of consumerism in the nineteenth and twentieth centuries. Topics will include the rise of museums, the development of mass-market journalism and literature, advertising, and the growth of commercial amusements. Readings focus primarily on the United States. Students will be encouraged to think historically and comparatively. Klein

### **HIGR 290. Library Research Methods (2)**

Introduction to library research methods for historians, including strategies, current and retrospective bibliography, computer-based resources, and special skills and knowledge for contemporary scholarly research. Includes bibliography project that may be undertaken with concurrent research seminar.

### **HIGR 295. Thesis Seminar (4)**

For students advanced to candidacy to the doctorate. Discussion, criticism, and revision of drafts of chapters of theses and of work to be submitted for publication.

### **HIGR 296. M.A. Thesis Direction (8)**

Independent work by graduate students engaged in research and writing of thesis.

### **HIGR 298. Directed Reading (1-12)**

Guided and supervised reading in the literature of the several fields of history. This course may be repeated for an indefinite number of times due to the independent nature of the content of the course. (S/U grades permitted.)

### **HIGR 299. Ph.D. Thesis Direction (1-12)**

Independent work by graduate students engaged in research and writing of doctoral theses. This course may be repeated for an indefinite number of times due to the independent nature of thesis writing and research. (S/U grades only.)

### **HIGR 500. Apprentice Teaching in History (1-4)**

A course in which teaching assistants are aided in learning proper teaching methods by means of supervision of their work by the faculty: handling of discussions, preparation and grading of examinations and other written exercises, and student relations. (S/U grades only.)

## HUMANITIES

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OFFICE: 1512 Galbraith Hall, Revelle College

The Humanities Program offers interdisciplinary courses in history, philosophy, and literature, with a focus on major aspects of the Western humanistic tradition. In these courses, students examine the development of a wide variety of ideas and forms of expression that exert a major influence on modern America. Through lectures and class discussions, and through the writing of essays, students learn to interpret literary, histori-

cal, and philosophical texts and to conduct independent critical assessments of documents and ideas.

The sequence of courses, Humanities 1 through 5, meets the humanities and writing requirement of Revelle College. Instruction in university-level writing is part of all five courses, but students in Humanities 1 and 2 (six units each) receive intensive writing instruction.

Students must have satisfied the university's Subject A requirement before registering for any part of the humanities sequence. Humanities 1 and 2 must be taken before Humanities 3-4-5.

For detailed description of the Revelle College humanities requirement, see "Revelle College, General-Education Requirements, Humanities."

## Courses

### LOWER DIVISION

#### **1. The Foundations of Western Civilization: Israel and Greece (6)**

Texts from the Hebrew Bible and from Greek epic, history, drama, and philosophy in their cultural context. Revelle students must take course for letter grade. *Prerequisite: satisfaction of the Subject A requirement.* (W)

#### **2. Rome, Christianity, and the Middle Ages (6)**

The Roman Empire, the Christian transformation of the classical world in late antiquity, and the rise of a European culture during the Middle Ages. Representative texts from Latin authors, early Christian literature, the Germanic tradition, and the high Middle Ages. Revelle students must take course for letter grade. *Prerequisite: satisfaction of the Subject A requirement.* (S)

#### **3. Renaissance, Reformation, and Early Modern Europe (4)**

The revival of classical culture and values and the reaction against medieval ideas concerning the place of human beings in the world. The Protestant Reformation and its intellectual and political consequences. The philosophical background to the scientific revolution. Revelle students must take course for letter grade. *Prerequisite: satisfaction of the Subject A requirement.* (F)

#### **4. Enlightenment, Romanticism, Revolution (1660-1848) (4)**

The enlightenment's revisions of traditional thought; the rise of classical liberalism; the era of the first modern political revolutions; romantic ideas of nature and human life. Revelle students must take course for letter grade. *Prerequisite: satisfaction of the Subject A requirement.* (W)

#### **5. Modern Culture (1848-present) (4)**

Challenges to liberalism posed by such movements as socialism, imperialism, and nationalism; the growth of new forms of self-expression and new conceptions of individual psychology. Revelle students must take course for letter grade. *Prerequisite: Satisfaction of the Subject A requirement.* (S)

#### **199. Special Studies (2-4)**

Individually guided readings or projects in area of humanities not normally covered in standard curriculum. *Prerequisite: upper-division standing or consent of instructor.*



## THE HUMANITIES MINOR

The humanities minor consists of six courses chosen from the listings of the Departments of History, Philosophy, Literature, Visual Arts, Music, and Theatre. All six courses *may* be selected from the upper-division offerings, but at least three upper-division courses *must* be included. Students for whom Humanities 1-5 fulfill general-education requirements may not also use these courses for the humanities minor.

Courses selected for the minor must be selected from the offerings of more than one department. They must concern themselves with more than one historical, national, or ethnic culture; and they must offer broad treatment of centrally important topics in the humanities. Thus, a course on the history of the United States since the Civil War would be appropriate for the humanities minor, while a course in the history of California would not.

Here are some examples of study lists appropriate for the humanities minor:

### Example 1:

History: HILD 3BC: European Society and Social Thought  
History: HILD 11: East Asia and the West  
Literature: LTGN 140B: Modern Chinese Literature in Translation  
Philosophy 123: Ethical Theories  
Philosophy 164: Philosophy of History

### Example 2:

History: HILA 102: Latin America in the Twentieth Century  
History: HIAF 111: Modern Africa since 1880  
Literature: LTGN 136: Latin American Literature in Translation  
Literature: LTEN 184: Afro-American Poetry  
Music 119: Music of the Nineteenth Century  
Visual Arts 126A: African and Afro-American Art

### Example 3:

Literature: LTEN 145: The English Novel: Modern Period  
Literature: LTEN 146: Women and English/American Literature  
Literature: LTGN 148: The Bible and Western Literature  
Philosophy 150: Aesthetics  
Philosophy 152: Philosophy and Literature  
Theatre 42: Drama Survey: Tragedy

Students should review their plans for the minor with the humanities adviser as well as with the advisers in their college. Before undertaking the minor, students must submit a study list for approval to the humanities office, 1512 Galbraith Hall.

## HUMANITIES MAJORS

Normally, students interested in majoring in humanities must choose a specific major in the humanities departments, i.e., history, literature, or philosophy. But students from Revelle and Muir Colleges may request to graduate with an approved individual/special project major in the humanities.

## INTERNATIONAL RELATIONS AND PACIFIC STUDIES GRADUATE SCHOOL (IR/PS)

OFFICE: Building 4, Level 1, Robinson Building Complex

### Professors

Peter Cowhey, Ph.D.  
Peter Gourevitch, Ph.D., *Dean*  
Chalmers Johnson, Ph.D.  
Miles Kahler, Ph.D.  
Alex Kane, Ph.D.  
Lawrence Krause, Ph.D.  
Bruce Lehmann, Ph.D.  
Gordon MacDonald, Ph.D.  
R. John McMillan, Ph.D.  
Susan Shirk, Ph.D.

### Associate Professor

Yasu-Hiko Tohsaku, Ph.D.

### Assistant Professors

Roger Bohn, Ph.D.  
Tun-jen Cheng, Ph.D.  
Takeo Hoshi, Ph.D.  
Taekwon Kim, Ph.D.  
Barry Naughton, Ph.D.  
Luis Rivera-Batiz, A.B.D.  
Frances Rosenbluth, Ph.D.  
Matthew Shugart, Ph.D.

### Adjunct

Harold Agnew, Ph.D.  
Paul W. Drake, Ph.D.  
Theodore Groves, Ph.D.  
Joseph Grunwald, Ph.D.  
J. Luis Guasch, Ph.D.  
Zalmay Khalilzad, Ph.D.  
David Mares, Ph.D.  
Lisa Martin, Ph.D.  
Michael May, Ph.D.  
Peter H. Smith, Ph.D.  
Christena Turner, Ph.D.

## THE MASTER OF PACIFIC INTERNATIONAL AFFAIRS (MPIA)

### REQUIREMENTS FOR ADMISSION

Students interested in pursuing the MPIA degree program at UCSD's Graduate School of International Relations and Pacific Studies (IR/PS) must have earned a B.A., or its equivalent, with training comparable to that provided by the University of California. A minimum scholastic average of 3.0 or better is required for course work completed in upper-division or prior graduate study. Undergraduate preparation that includes one or more of the following is strongly encouraged: the social sciences (specifically economics and political science) and history; computer science and quantitative methods (such as calculus and statistics); foreign language and related area studies courses. Students with an undergraduate background in the sciences or the arts are also encouraged to explore this degree program. The admissions committee looks for students with previous professional employment, a history of meaningful international experiences, and demonstrated leadership ability.

Applicants must submit three letters of recommendation from individuals who can attest to their academic or professional competence and to the depth of their interest in pursuing graduate training in international affairs.

Applicants are required to submit the Graduate Record Exam (GRE) scores (verbal, quantitative, and analytical). (Indicate code #1901 for UCSD, Pacific International Affairs.) Scores from the Graduate Management Admission Test (GMAT) may be substituted. (Indicate code #4927 for UCSD, Pacific International Affairs.) A minimum score of 550 on the Test of English as a Foreign Language (TOEFL) is required of all international applicants whose native language is not English and whose undergraduate education was conducted in a language other than English. Students who score below 600 on the TOEFL examination are strongly encouraged to enroll in an English as a second language program before beginning graduate work. (UCSD Extension offers an excellent English language program during the summer as well as the academic year. For further information, call (619) 534-3400.)

Interviews are not required for admission to the MPIA program, but are available for all applicants who would like further information about the degree programs. Interviews assist applicants in becoming better acquainted with IR/PS's graduate programs and in understanding how these programs might relate to their long-term career

goals. Applicants are advised to contact the IR/PS office at (619) 534-5914 well in advance of the January 15 application deadline to schedule appointments.

The MPA is a two-year, full-time program. Those students who enter, however, with no previous language training in Mandarin Chinese, Japanese, Korean, or Spanish will need to spend more time in the program. Given the intensive, integrated nature of the MPA curriculum, part-time study is not feasible. The minimum required course-load is twelve units per quarter.

**THE MPA CURRICULUM\***  
**(NINETY-SIX UNITS)**

**Core Curriculum**

The Core Curriculum is designed to integrate the diverse subject areas of international management, international relations, and comparative public policy as well as regional studies and foreign language. Core courses list as follows:

- Economics (Managerial and International Economics)
- Management (Accounting and Finance)
- International Relations (International Politics and The Politics of International Economic Relations or International Security)
- Policy-Making Processes (two-quarter sequence)
- Regional Specialization: Students are required to specialize in one particular country or region in the Pacific. To fulfill this requirement, students must take two courses in one of four areas: China, Japan, East Asia, or Latin America. (Additional areas will be incorporated into the curriculum as the school expands.)
- Foreign Language: A minimum level of language proficiency must be met through examination prior to award of the MPA degree. Students' designated foreign language must correspond to the geographical area selected for regional specialization.
- Quantitative Methods (two-quarter sequence)

\*Note: The MPA curriculum is currently undergoing minor revision. Students are advised to check with IR/PS for curriculum requirements.

**Two-Year Master's Program**

**First Year**

- Fall*
- Policy-Making Processes (4)
  - Managerial Economics (4)
  - International Politics (4)
  - Quantitative Methods (2)
  - Elective (4)/Language (4)

- Winter*
- Policy-Making Processes (4)
  - International Economics (4)
  - Accounting (4)
  - Quantitative Methods (2)
  - Elective (4)/Language (4)

- Spring*
- The Politics of International Economic Relations (4) or International Security (4)
  - Finance (4)
  - Elective (4)
  - Elective (4)/Language (4)

**Second Year**

- Fall*
- Policy Workshop (4)
  - Elective (4) or Regional Specialization\* (4)
  - Elective (4)/Language (4)
  - Elective (4)

- Winter*
- Policy Workshop (4)
  - Elective (4) or Regional Specialization\* (4)
  - Elective (4)/Language (4)
  - Elective (4)

- Spring*
- Elective (4)
  - Elective (4) or Regional Specialization\* (4)
  - Elective (4)/Language (4)

\*Two regional specialization courses are required.

*This program summary represents a sequence of courses that most MPA students are likely to take.*

**CONCENTRATIONS AND ELECTIVES**

The MPA program's elective course work allows for flexibility in response to the wide diversity of marketplace employment options as well as in students' backgrounds, interests, and needs. Students have the opportunity to declare a career concentration or regional concentration. Although concentration in a career or regional area is not mandatory, it enables individuals to work closely with other students and faculty who share similar interests. In addition, concentration in a particular career or regional area may serve to enhance career entry opportunities and improve initial on-the-job performance.

**CAREER CONCENTRATIONS**

A career concentration requires that the student take six elective courses in one of three ca-

reer concentration areas. IR/PS offers career concentrations in the following areas:

*International Management:* An international management concentration includes intermediate and advanced courses in such areas as corporate finance, accounting, and international marketing—similar to those offered in M.B.A. programs—as well as courses focusing on international business activities such as multinational corporations, project analysis and planning, trade, and risk analysis.

*International Relations:* This concentration includes courses examining the political-military relations among states as well as political dimensions of interstate relations. Attention is directed toward the Pacific region as an international subsystem.

*Comparative Public Policy:* This concentration includes courses comparing public policies in Pacific region countries in such areas as industry, development, labor, technology, natural resources, health, and social security. The focus is on public sector policies as well as public and private sector interrelations in policy formation and implementation.

**REGIONAL CONCENTRATIONS**

A regional concentration requires that the student take two additional regional area courses. The main areas of concentration currently include China, East Asia, Japan, and Latin America.

**POLICY WORKSHOP**

The Policy Workshop (a two-quarter sequence) introduces policy and management case studies simulating real-world issues that students will address in their professional lives. In addition, students participate in an international simulation laboratory where teams compete as corporate managers or government policymakers. The workshop serves as the capstone sequence for the MPA program and is taken during the final year of residency. Students work together on problems in business and government strategy, utilizing decision analysis and computer simulation techniques in evaluating the problems examined. The material introduced is designed to develop analytical, technical, and communications skills.

**FOREIGN LANGUAGE**

IR/PS considers foreign language competency an indispensable skill for international relations professionals. All students are expected to acquire the language skills necessary to work in the Pacific region. The foreign language proficiency requirement is designed to ensure that

students achieve a level of competency sufficient for professional interaction.

At the present time, students can fulfill the foreign language requirement in Mandarin Chinese, Japanese, Korean, or Spanish. The language selected for the requirement must coincide with the student's regional specialization. As languages differ greatly in their relative degree of difficulty, the level of required competency varies among these languages. The minimum required level of proficiency for Spanish is equivalent to two-plus on the Foreign Service Institute Scales (FSI)—and two-minus for Mandarin Chinese, Japanese, and Korean. Students must pass the proficiency examination administered by the IR/PS Language Program before receiving their degree.

A variety of language courses are offered by UCSD. IR/PS is currently offering four-unit language courses for professional proficiency in the three languages at intermediate to advanced levels. Students with a lower level of language proficiency are encouraged to take beginning and intermediate language courses offered by the Chinese Studies Program, the Japanese Studies Program, and the Department of Linguistics. These courses serve as prerequisites for the language proficiency courses offered at IR/PS, which in turn prepare students for the proficiency examination.

Students may prepare for the proficiency examination in a variety of ways, depending on their language background, aptitude for learning languages, and actual time and effort invested in language study at IR/PS. In general, students fall into one of four categories with respect to language study: 1) those who enter at a superior level of proficiency may be waived out of the language requirement; 2) those who enter with a rough equivalence of three years of Chinese or Japanese or two-plus years of Spanish should be able to achieve the requisite level in two years without any intensive language training during the first summer; 3) those who enter with a rough equivalence of two years of Mandarin Chinese or Japanese language or one-plus years of Spanish will usually be able to achieve the requisite level in two years by a combination of intensive language study in the summer and the six language courses for professional proficiency in the two-year program; 4) those who enter with less training in these foreign languages will need to spend at least two and one-half to three years in the program. Intensive summer sessions for two or three summers and language courses during the academic year should enable students to achieve the required proficiency.

The proficiency examination will be given throughout the academic year. To take the examination, students must petition the director of the

Language Program. The petitioning process involves consultation and advising with the student's current language instructor and the director of the Language Program. Students have two opportunities to take the proficiency examination free of charge. An administrative fee will be charged for each subsequent examination.

### **INTERNSHIPS**

Students are encouraged to participate in various internship programs that are available in business and industry, in federal and state government, and through various foundations and institutions. The school has established links to a number of programs with available internships.

### **CAREER DEVELOPMENT AND OPPORTUNITIES**

The IR/PS Career Services Office provides students with assistance in professional career development. This assistance begins in the students' first quarter and continues through the interviewing process in the final quarter.

Career services include individual advising appointments, workshops, speaker forums, special events, and a library containing international resources and employment opportunity listings. Specialized workshops explore résumé writing, cover letters, salary and benefits negotiation, job-offer evaluation, interviewing skills (including videotaped mock interviews), career goals, labor market trends, and effective job search strategies.

### **THE PH.D. IN INTERNATIONAL AFFAIRS**

The Ph.D. in international affairs is designed for students who wish to undertake advanced work in preparation for careers in university teaching and research or as international affairs researchers and specialists in business, government, consulting, or research organizations. The number of students admitted to the program each year is small and, within the general requirements described below, programs of study are designed to fit individual interests.

### **REQUIREMENTS FOR ADMISSION**

Students who seek admission to the program must have a B.A. or equivalent from an institution of comparable standing to the University of California. Preference will be given to students with prior academic records of distinction and to those who have a background in one of the geographical areas or fields of emphasis covered in the program. The GRE (verbal, quantitative, and analytical) is required of all applicants. (Indicate

code #1901 for UCSD, Pacific International Affairs.) Scores from the Graduate Management Admissions Test (GMAT) may be substituted. (Indicate code #4927 for UCSD, Pacific International Affairs.) A minimum score of 550 on the Test of English as a Foreign Language (TOEFL) is required of all international applicants whose native language is not English and whose undergraduate education was conducted in a language other than English. Students who score below 600 on the TOEFL examination are strongly encouraged to enroll in an English as a second language program before beginning doctoral work. (UCSD Extension offers an excellent English language program during summer as well as the academic year. For further information, call (619) 534-3400.)

### **PROGRAM OF STUDY**

The Ph.D. program prepares students for research careers in international affairs dealing with the Pacific region. In contrast to doctoral programs within social science departments which follow the intellectual agendas of their disciplines, the Ph.D. in international affairs program takes an interdisciplinary approach to the economic and policy issues of the Pacific region. The program is designed to combine the analytical skills of specific disciplines with interdisciplinary analysis of policy issues. The program also exposes students to both public and private perspectives on these issues.

Prior to the first year of residence, students select a major and a minor field of study. Within the major field, each student indicates a special interest from which the dissertation may develop. The minor, composed of four courses, is a secondary field complementing the student's major field of emphasis. Knowledge of the major and minor fields is evaluated by comprehensive examinations; knowledge of the Pacific region is demonstrated through course work in three courses dealing with a country or subregion in the Pacific.

Each student is assigned a Program Advisory Committee of three faculty members, two of whom must be faculty members at IR/PS. With this committee, the student works out a plan of study which the committee must approve.

### **THE MAJOR FIELD AND MINOR FIELDS**

- International Relations
- International Economic Policy and Management
- Comparative Policy Analysis

At the time of application into the Ph.D. in international affairs program, students must de-

clare a major in international relations, international economic policy and management, or comparative policy analysis. Transfer between majors is discouraged and can only be accomplished through petition. All students are required to take a four-course minor in a field different from the one in which they are majoring. Students must demonstrate through comprehensive examinations that they have acquired a strong foundation in the theories and methods of the relevant disciplines as well as the ability to apply this disciplinary knowledge to the analysis of policy problems. Course work in the major and minor fields may be in both IR/PS and, with adviser's permission, in related departments. Students must make satisfactory progress in a coherent program of course work and reading courses in the major and minor fields which meets the approval of their Program Advisory Committee.

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### **PACIFIC REGION ISSUES**

Students must take at least three courses on policy processes and issues in the Pacific region. These courses must focus on the Pacific region as a whole, a subregion, or individual countries. The courses may be in both IR/PS and, with prior permission, related departments. Some students may choose to take more than the minimum three courses to deepen their knowledge of a particular country or area. Qualifying examinations on regional areas are not required.

### **SKILL REQUIREMENTS**

Students must satisfy the following skill requirements:

1. Basic Requirements: All Ph.D. students must have at least a rudimentary knowledge of statistics and a foreign language. The course requirements are:
  - Quantitative Methods: the equivalent of one course in statistics, and
  - Foreign Language: the equivalent of two years of college-level foreign language.
2. Advanced Requirements: To prepare for carrying out independent research, students must have either advanced competence in quantitative methods or a foreign language. The choice will depend on each student's research interests and professional goals. Some students may devote the extra time and effort required to achieve advanced competency in both quantitative methods and foreign language. The requirements are:
  - Quantitative Methods: the ability to use advanced methods of statistical data analysis and mathematical modeling in research, certified by courses or examination, or

Foreign Language: a research working knowledge, certified by a written and oral examination.

### **GRADUATE POLICY SEMINAR**

Doctoral students must participate in the Graduate Policy Seminar in their second or third year of study. This seminar brings together advanced Ph.D. students and faculty to discuss policy issues in the Pacific region. The course requires students to make presentations of literature reviews, research papers, and a major piece of independent research contributing to the dissertation prospectus.

### **COMPREHENSIVE EXAMINATIONS**

Students will normally prepare for comprehensive examinations by taking course work offered by the school and related disciplinary departments. At least one-third of all courses must be taken at IR/PS. (Remaining courses must be taken at the graduate level.) Students who have completed master's programs elsewhere may discuss with their Program Advisory Committee ways of incorporating their previous course work into the Ph.D. program at IR/PS.

### **QUALIFYING EXAMINATIONS**

Students must pass written comprehensive examinations in their major and minor fields. These exams will be administered by a committee of IR/PS faculty and evaluated on a pass, fail, or pass with distinction basis.

### **DISSERTATION**

Candidates must present a dissertation prospectus no later than March of their third year in the doctoral program. They will be examined on their prospectus by their Dissertation Committee and must complete a dissertation which makes a substantial and original contribution to knowledge commensurate with the standards of the University of California in order to receive the Ph.D. degree.

### **ORAL DEFENSE**

Students will defend their dissertation at a final oral examination which will be open to the public.

### **PH.D. CURRICULUM REQUIREMENTS FOR A MAJOR IN INTERNATIONAL RELATIONS**

All students with a major in international relations must complete a core requirement, including courses in international relations theory, in-

ternational relations of the Pacific region, strategic analysis, quantitative methods, and a graduate policy seminar (three-quarter sequence). Other requirements include two additional regional courses, a four-course minor, and seven elective courses—five in international relations and two in any field.

### **PH.D. CURRICULUM REQUIREMENTS FOR A MAJOR IN INTERNATIONAL ECONOMIC POLICY AND MANAGEMENT**

All students majoring in international economic policy and management must complete the core requirement which includes five three-quarter sequence courses in microeconomics, macroeconomics, econometrics, and both a research and graduate policy seminar. Other course requirements include two electives, a three-course regional requisite, and a four-course minor.

### **PH.D. CURRICULUM REQUIREMENTS FOR A MAJOR IN COMPARATIVE POLICY ANALYSIS**

The core requirements for a major in comparative policy analysis include courses in managerial economics, public finance, international economics, quantitative methods, policy analysis, regional courses, and a graduate policy seminar (three-quarter sequence). In addition to the core requirements, students must take three micro-processes courses and three macro-processes courses from thematic and regional offerings. Other requirements include both a three-course regional requisite and a four-course minor.

Specific course requirements for all Ph.D. major and minor fields of study are available through the IR/PS Office of Student Affairs.

### **INTERNATIONAL CAREER ASSOCIATES PROGRAM**

The International Career Associates Program is designed for working professionals seeking additional exposure to the various areas of international management, international relations, and comparative public policy. Participants in the program spend an academic year at IR/PS usually beginning in mid-September and ending in mid-June. Under the auspices of the program, professionals have an opportunity to further internationalize their knowledge and experience as well as enhance their professional development in such areas as finance, management, market-





ing, accounting, quantitative methods, econometrics, long-range strategic planning, international affairs, and comparative decision making. The program of study is tailored to individual interests under the guidance of the program's director and faculty advisers.

### **IR/PS offers:**

1. An individualized one-year program leading to a Certificate of Study
2. Opportunities to interact with world-renowned Pacific Rim scholars and policymakers
3. Special seminars and lectures by academics and professionals
4. Programmatic activities relevant to policy, trade, and financial issues
5. Group programs to explore diversities and commonalities within represented countries
6. IR/PS-sponsored cultural events and field trips to local, state, and national organizations and government offices

For further information, contact the International Career Associates Program office at (619) 534-7420.

## **Courses**

### **MPIA CORE CURRICULUM**

#### **IP/Core 400A-B. Policy-Making Processes (4-4)**

A two-course sequence designed to teach students how to "read" a country's political and economic system. The course will examine how the evolution of different institutional frameworks in the countries of the Pacific region influences the way in which political choices are made.

#### **IP/Core 401. Managerial Economics (4)**

Survey of basic tools in economics. Examination of how commodity demand is determined, what affects supply of the commodity, how price is determined, when optimal market allocation of resources and failure occurs, and basic topics concerning the aggregate economy.

#### **IP/Core 403. International Economics (4)**

The theory and mechanics of international economics. Included will be such topics as real trade theory, international movements of capital, the effects of trade and capital flows on domestic economies, and policies toward trade and foreign investment.

#### **IP/Core 410. International Politics (4)**

Introduction to international politics focusing on the rise and demise of the Cold War. Combines postwar diplomatic history with the core concepts and analytical approaches of international relations. Emphasizes the interplay between structure and strategy.

#### **IP/Core 411. The Politics of International Economic Relations (4)**

The course presents explanations for the political organization of international economic relations in different issue-areas. Ad-

ditional topics include international economic inequality, efforts by states to manipulate economic relations for strategic gain, and the prospects for regional and global organizations.

#### **IP/Core 412. International Security (4)**

Examination of origins, character, and consequences of fundamental security dilemmas of states and possible means of resolution. Phenomena explored include: causes of war and conditions of peace; arms races; deterrence; balance of power; alliances; security regimes; and current U.S. strategic debate.

#### **IP/Core 420. Accounting (4)**

An introduction to financial accounting designed to prepare students to understand their own organizations' international operations and interpret information from outside organizations. The emphasis will be on understanding the potential uses and limitations of accounting information for various management purposes, and the procedural aspects of accounting will be introduced only to the extent necessary to explicate the basic concepts.

#### **IP/Core 421. Finance (4)**

This course surveys the financial problems facing managers and analyzes financial institutions, financial instruments, and capital markets. Tools acquired will prepare students to analyze international financial topics such as exchange rate behavior, the management of international risk, and international financing.

#### **IP/Core 430. Economic and Social Development of China (4)**

This course examines China's development experience from a generally economic standpoint. Contents include: patterns of traditional Chinese society and economy; geography and resource constraints; impact of the West and Japan; development since 1949; and contemporary problems and options.

#### **IP/Core 431. Chinese Politics (4)**

This course will analyze post-1949 Chinese politics, including political institutions, the policy-making process, and citizen political behavior. Special attention will be paid to the prospects for political reform in China.

#### **IP/Core 434A. Modern Japanese Political Economy and Decision Making (4)**

An advanced-level survey of modern Japanese political and economic development since the Meiji Restoration, with attention to some of the main controversies concerning Japan, including the place of Japanese culture in Japan's achievements, the failure of prewar democracy and the rise of militarism, and continuities between prewar and postwar Japan.

#### **IP/Core 434B. Modern Japanese Political Economy and Decision Making (4)**

An analysis of the core institutions in Japanese society (ruling party, bureaucracy, and "zaikai" [big business]) and how they interact with each other. Attention will also be given to the changing place of law in the Japanese system and to the costs and benefits of Japanese innovations in management and labor relations. *Prerequisite: IP/Core 434A.*

#### **IP/Core 438. State and Society in Latin America (4)**

Comparative survey of the multiple roles of the state in contemporary Latin America, with special emphasis on the politics of economic policy. Analysis of public policies regarding such problems as agricultural production, incomes and wages, stabilization, investment, and external debt in a variety of political settings: authoritarian, reformist, and revolutionary.

#### **IP/Core 439. Economic Policy in Latin America (4)**

This course seeks to enhance the students' understanding of the main policy alternatives open to the largest Latin American countries. Development and stabilization policies are analyzed, emphasizing the current debate between conventional and heterodox policy packages and their impact on decision making.

#### **IP/Core 440. Politics and Policy in Latin America (4)**

An overview of the contemporary politics in Latin America: democracy, authoritarianism, and revolutionary change. Readings will be mostly comparative, either dealing with groups of countries within Latin America or comparisons between Latin America and other regions of the world.

#### **IP/Core 453. Quantitative Methods: Decision Making and Scenario Analysis (2)**

This course is designed to provide proficiency in quantitative methods that are used for optimization and decision making. It first develops graphic and analytical solutions to resource allocation and efficient production. Next, scenario analysis and elements of decision making under uncertainty are introduced. Finally, the use of spreadsheets is applied to data analysis and problem solving.

#### **IP/Core 454. Quantitative Methods: Decision Making under Uncertainty (2)**

This course covers elements from statistics that are central to business decision making under uncertainty. In particular, regression analysis and estimation will be applied to problems of forecasting and optimization.

#### **IP/Core 456A-B. Policy Workshop (4-4)**

A two-quarter course sequence. Assignments and class discussions involve: (1) analysis of case histories or corporate and public policymaking and (2) participation in an international simulation laboratory. Students manage corporate and government teams that compete in quality of decisions, forecasting, and analysis.

## **GENERAL COURSES**

#### **IP/Gen 400. International Relations of the Pacific (4)**

International relations and developing international political economies of nations bordering the Pacific. Topics include: the "Pacific Basin" concept; the U.S. and "hegemonic-stability" theory; legacies of Korean War and Sino-Soviet dispute; immigration patterns and their consequences; and Japan's foreign policy.

#### **IP/Gen 402. Political Dimensions of International Finance (4)**

Examination of effects of national policies and international collaboration of public and private international financial institutions, in particular management of international debt crises, economic policy coordination, and the role of international lender of last resort. *Prerequisites: IP/Core 411, or consent of instructor. Conjoined with Political Science 144D and 262.*

#### **IP/Gen 403. International Institutions (4)**

The role of international institutions in the contemporary world system. Institutions are defined broadly to include regimes, norms, and conventions as well as formal organizations. *Prerequisites: IP/Core 410; 411 or 412, or consent of instructor.*

#### **IP/Gen 412. The Politics of International Competitiveness (4)**

Examination of policy debates concerning international economic relations: what policies promote or encourage effective participation in the international economy, and what political factors support or oppose such policies? Examples are drawn from the experiences of the U.S., Japan, Europe, Latin America, and East Asia.

#### **IP/Gen 413. The Political Economy of Regulated International Markets (4)**

This course examines the politics and economics of world markets that are subject to extensive government regulation. Cases include examples from the services, manufacturing, and commodities markets. The course investigates why there are different types of regulation for each market, how global regulations interact with national regulations, and how firms respond to regulations.



**IP/Gen 414. U.S. Strategic Policy Issues in a Changing World (4)**

Strategic issues facing the U.S. in the nineties will be described and analyzed. Issues taken up will include nuclear weapons policy, space policy, European and Northeast Asia security policies. Political, military and technical aspects of these issues will be analyzed. *Prerequisite: Graduate status or consent of instructor. Some background in political science and in quantitative analysis of issues desirable.*

**IP/Gen 420. Principles of Marketing (4)**

This course develops the micro-economic foundations of market exchange by explicitly examining the marketing details of transactions: demand and product differentiation, incomplete and incorrect information, search costs and promotion costs. It is argued that within this theoretical framework (i.e., model) most observed marketing behavior can be reconciled. The primary objective of this course is to learn to deduce firm and consumer motives from observed behavior. *Prerequisites: IP/Core 401 and 403, or consent of instructor.*

**IP/Gen 421. International Marketing (4)**

This course focuses on decision making in international marketing. The impact of cultural, social, political, economic, and other environmental variables on international marketing systems and the decision making process of multilateral marketing operations will be addressed. *Prerequisites: IP/Core 453 and 454, and IP/Gen 420 or consent of instructor.*

**IP/Gen 422. Investments (4)**

An analysis of the risk/return characteristics of different assets as perceived by different investors and their implications for security price behavior, emphasizing real world capital market behavior. International aspects include the role of exchange rate risk and international diversification. *Prerequisite: IP/Core 421, 453, and 454, or consent of instructor.*

**IP/Gen 423. Industrial Organization (4)**

The interactions among firms and between firms and consumers. How firms compete and collude. The efficiency implications of different market institutions. Public policy toward industry. *Prerequisites: IP/Core 401 and 403, or consent of instructor.*

**IP/Gen 424. Corporate Finance (4)**

The topics covered are dividend policy and capital structure, options, debt financing, and short- and long-term in financial planning. Course format will be mostly lectures, with occasional cases. Some international aspects of corporate finance will also be discussed. *Prerequisite: IP/Core 421, 453, and 454, or consent of instructor.*

**IP/Gen 425. The Internal Organization of the Firm (4)**

The employment relationship. Separation of ownership and control. Principal-agent relationships. Hierarchies. Team Production. Incentive effects of alternative forms of organization. The boundaries between the firm and the market. *Prerequisites: IP/Core 401 and 403, or consent of instructor.*

**IP/Gen 427. Comparative Management Systems (4)**

A survey of recent research comparing management systems, in particular, those of Japan and the U.S. The topics to be covered are strategic management, organization structures, personnel systems, work attitudes, and compensation plans. Systematic data, as well as case studies, will be presented.

**IP/Gen 428. Human Behavior in Organizations (4)**

Examination of factors influencing behavior of people in organizations. Psychology of the individual, interpersonal relations, work groups, conflict resolution, organizational structure, rewards and punishments, leadership, and the structures of culture of the larger global sociopolitical environment will be covered.

**IP/Gen 429. Quantitative Analysis for Management Decisions (4)**

This course is concerned with the systematic analysis of problems. It treats subjects that belong to a general area usually called operations research, management science, or systems analysis. Although a number of analytical tools will be presented, the focus will be on developing a quantitative approach to managerial problems. There will be a continuing emphasis on managerial applications through the use of examples and case materials.

**IP/Gen 430. The Comparative Politics of International Financial Markets (4)**

This course examines the interaction between political and market forces in the rapidly changing international financial markets. Students are introduced to theories of regulation, an historical overview of financial markets in comparative perspective, and analysis of the current global trend towards financial deregulation.

**IP/Gen 431. Fiscal and Monetary Policy (4)**

Effects of fiscal and monetary policies on aggregate variables such as output, nominal and real interest rates, price level, and employment. Additional topics include the inflation/unemployment trade-off, budget deficit, and economic growth.

**IP/Gen 432. The Firm in Global Competition (4)**

The theory of gains from international trade is used for understanding current issues in trade policy. Then the viewpoint switches from country to firm: What gives firms an edge in international competition? How does firm organization vary across countries? *Prerequisites: IP/Core 401 or 403, or consent of instructor.*

**IP/Gen 433. International Finance (4)**

The international financial system will be addressed including the perspectives of individual investors, borrowers, and financial intermediaries. Public policy issues including the exchange rate mechanism, financial linkages among countries, optimum currency areas and macro-policy coordination will be discussed. *Prerequisites: IP/Core 403, 421, or consent of instructor.*

**IP/Gen 434. Strategic Analysis (4)**

This course analyzes competitive interactions, surveying the modern economic analysis of relationships between and within organizations. The foundations of the course are game theory and the economics of information. Topics include bargaining and contracting, principal-agent models, and bidding models.

**IP/Gen 435. Advanced Topics in International Trade (4)**

Assumes student participants have a background in basic theories of international trade. Introduction to advanced theories and current topics in international trade, including technological transfer between countries, trade patterns between North and South, etc. *Prerequisites: IP/Core 401 and 403, or consent of instructor.*

**IP/Gen 436. Public Finance: Taxation (4)**

A survey of taxation theory and institutions. Effect of taxation on efficiency and income distribution. Deficit financing and the burden of the debt. Tax system and structure of the U.S. and other Pacific Rim countries.

**IP/Gen 437. Strategy and Planning in Production and Operations Management (4)**

This course examines manufacturing, distribution, and service activities that are relevant to the strategic management of operations. It explores the everyday control of operations, the design of the production system, and the interface between operations and other aspects of the firm's overall strategy. *Prerequisite: IP/Gen 438 or consent of instructor.*

**IP/Gen 438. Production and Operations Management: Analysis and Control (4)**

This course provides a comprehensive introduction to the fundamental decisions and trade-offs associated with the control

of a firm's operations function. It analyzes production processes, quality control, inventory and materials planning, kanban and just-in-time principles. *Prerequisites: IP/Core 453 and 454, or consent of instructor.*

**IP/Gen 439. International Manufacturing Strategy: Selected Topics (4)**

This course covers selected issues emerging from the recent trends in globalization of a firm's manufacturing activities. Topics include globalization of manufacturing base, international comparison of manufacturing management, the role of manufacturing in the global competition. *Prerequisite: IP/Gen 438 or consent of instructor.*

**IP/Gen 440. Managerial Accounting and Control (4)**

Focus on planning, managing, controlling and evaluating costs for competitive advantage in global markets. Key topics will include cost structure, cost-based managerial decision making, strategic cost management, JIT/TQC cost management, and accounting control systems. *Prerequisite: IP/Core 420 or consent of instructor.*

**IP/Gen 441. Seminar in Advanced Topics in Production and Operations Management (4)**

Studies of advanced analytical techniques in operations management. Emphasis is on the application of various analytical methods to operational problems. Students are encouraged to carry out a research project for the actual applications of these techniques. *Prerequisite: IP/Gen 438 or consent of instructor.*

**IP/Gen 450. Comparative Government-Business Relations (4)**

Explores the general issue of the interaction between market forces and government, focusing on mediation between public and private sectors. Examines several principal mediation mechanisms: business associations, consultative bodies, and so on. Proposes a typology for examining the logic of membership and the logic of action of the business community.

**IP/Gen 451. Economic Development (4)**

Comparative patterns of industrialization and agricultural modernization. Stresses on certain common features of the modernization process and widely varying endowments, policies, and experiences of different countries. *Prerequisites: IP/Core 401 and 403, or consent of instructor.*

**IP/Gen 454. Comparative Welfare States/Social Policies (4)**

Growth of the welfare state in advanced industrial societies, current tensions and transformations in contemporary welfare states. Empirical focus on social security, health, welfare, and labor market policies in Britain, Sweden, Germany, Canada, and the U.S. Conjoined with Sociology 247.

**IP/Gen 455. Technology and Trade in Economic Growth (4)**

Examination of the latest research on economics of technological change, role of trade in economic growth, and determinants of economic growth. Focus will be on structures and policies that support or impede growth in different regions.

**IP/Gen 456. Program Design and Evaluation (4)**

Introduction to elements of program design and evaluation. Examines principles and guidelines used in creating a program and evaluating its success or failure. International case studies are explored. Students have the opportunity to develop their own program and evaluation projects.

**IP/Gen 457. Policy Analysis (4)**

Examination of public policy analysis, such as cost-benefit analysis and project evaluation, for use in policy formation. Sustainable development will receive particular attention. Case studies emphasizing the environment, agriculture and food, and economic development will be included.

**IP/Gen 458. International Environmental Policy (4)**

Review of environmental issues, including transboundary air and water pollution, acid rain, ozone depletion, species eradication, whaling, and climate change. Economic, political, and social consequences of international environmental disputes. Current approaches to environmental policy analysis.

**IP/Gen 459. Conflict Resolution of Environmental Issues (4)**

Use of bilateral negotiations (U.S.-Canada), regional organization (ECE and acid rain in Europe), and United Nations' specialized agencies (UNEP and WMO on ozone depletion and climate change) to mediate environmental disputes. Consideration of nontraditional approaches resolving international environmental problems.

**IP/Gen 465. Economy of China (4)**

Survey and assessment of China's economic development since 1949. Section on agriculture; industry; foreign trade; and financial and macroeconomic problems. Economic analysis of the state-dominated mixed economy emerging from current reforms. *Prerequisites: IP/Core 401 and 403, or consent of instructor. IP/Core 430 recommended.*

**IP/Gen 466. Chinese Foreign Policy (4)**

Examination of Chinese perceptions of the world, domestic sources of foreign policy, military and security issues, foreign trade, and cultural ties. Relations with the two superpowers will be emphasized. Relations with Japan and the Third World will also be covered.

**IP/Gen 471. Japanese Economy (4)**

A broad survey of the Japanese economy, together with in-depth examination of some distinctively Japanese phenomena such as savings behavior, financial structure, industrial organization, and labor markets. *Prerequisites: IP/Core 401 and 403, or consent of instructor.*

**IP/Gen 472. Japanese Corporate Culture (4)**

This course examines Japanese cultural values and social relations in the context of business organizations. The central focus will be on the integration of individuals into their organizations and on the human relation characteristic of their work environments.

**IP/Gen 473. Japan's Foreign and Defense Policies (4)**

Examination of major issues in the evolution of Japan's foreign and defense policies. Emphasis will be given to the analytical considerations and policy interests in the management of Japan's foreign relations.

**IP/Gen 476. Latin America: Society and Politics (4)**

Course focuses on the different types of social structures and political systems in Latin America. Topics include: positions in the world economy, varieties of class structure and ethnic cleavages, political regimes, mobilization and legitimacy, class alignments, reform and revolution. Conjoined with Sociology 188D.

**IP/Gen 477. Latin American Politics (4)**

Introductory reading seminar on Latin American politics to acquaint students with leading schools of thought, provide critical perspective on premises and methodology, and identify themes for further inquiry. Themes include authoritarianism, revolution, democratization, regional conflict, and emergence of middle-level powers. Conjoined with Political Science 235A.

**IP/Gen 478. Mexican Economic Policy (4)**

This course offers an overview of economic policy in Mexico. It covers the shift from "stabilizing growth" in the 1950s and 1960s to crisis in the 1970s and 1980s and current reforms. International interactions and current developments are stressed.

**IP/Gen 479. Regime Change in Latin America (4)**

Theories and case studies of regime change, including transitions to democracy and the breakdown of democracy. Revolu-

tion is examined as a special type of regime change. Case studies of countries such as Chile, Peru, Nicaragua, and El Salvador are used. Attention is given to the recurrence of certain political "models," such as the Mexican and Peruvian, with attempts to explain why the imitation of such models is rarely successful.

**IP/Gen 480. Health Policy Development in Mexico and Latin America: Implications for U.S.-Mexican Immigration and Border Relations (4)**

Analysis of health policies in Mexico and Latin America, with special reference to consequences for the United States. Focus on country cases, international migration, and the U.S. border region.

**IP/Gen 481. Stabilization, Reform, and Internationalization in the World Economy (4)**

This course offers a comparative perspective on economies' adaptation to the environment of the nineties. It focuses on international financial change, macrostabilization, and long-term reform in the Pacific Rim and Europe.

**IP/Gen 482. East Asian NICS (4)**

Forces explaining the success of four economies in East Asia (South Korea, Taiwan, Hong Kong, Singapore), and two natural resource-rich states (Malaysia, Thailand) will be addressed. Theoretical models, implementation of development policies/strategies, and sociopolitical causes and consequences of development will be discussed. *Prerequisites: IP/Core 401 and 403, or IP/Core 410 and 411, or consent of instructor.*

**IP/Gen 483. Comparative Economic Systems (4)**

Economic systems and their transformation in developed and developing countries. Socialism and the transition from central planning to the market. Capitalism and government interventions to foster growth or equity. Coverage may include Russia, Japan, Poland, Sweden and Brazil. *Prerequisites: IP/Core 401 and 403, or consent of instructor.*

**IP/Gen 484. Korean Politics and Society (4)**

This course will examine characteristics and distinctive aspects of contemporary Korean society and politics. Emphasis will be placed on continuity and change in social values, political culture and leadership, economic growth and its impact, and democratization and its future prospects.

**IP/Gen 485. The Political Economy of South Korea (4)**

Analytical review of South Korea's economic performance. Examination of major policy changes (e.g., shifts toward export-promotion, heavy and chemical industrial promotion); Korea's industrial structure including the role of large enterprises (*chaebol*); role of government; links between Korea and other countries.

**IP/Gen 488. Comparative Cultural Environments (4)**

A course on the interpretation of similarities and differences of cultural forms and social forces in order to prepare students to understand and act in different sociocultural settings. Cultural schemas and values underlying a variety of religious and cultural belief systems significantly shape the ways in which people in different societies think and behave.

**IP/Gen 490. Special Topics in Pacific International Affairs (4)**

A seminar course at an advanced level on a special topic in Pacific international affairs. May be repeated for credit.

**IP/Gen 497. Internships (4-12)**

Field research in an area relevant to career and/or regional specialization. May be repeated for credit.

**IP/Gen 498. Directed Group Study (2-12)**

Directed reading in a selected area. The content of each course is to be decided by the professor directing the course with the approval of the student's faculty adviser. May be repeated for credit.

**IP/Gen 499. Independent Research (2-12)**

Independent research under the guidance of a faculty member in IR/PS. May be repeated for credit.

LANGUAGE COURSES

**IP/Lang 1A-B-C. First-Year Korean: Korean Conversation (2-2-2)**

Tutorial meetings to practice Korean conversation. Must be taken with IP/Lang 1AX, BX, CX.

**IP/Lang 1AX-BX-CX. First-Year Korean: Analysis of Korean (3-3-3)**

Introduction to the phonology, orthography, morphology, and syntax of the Korean language. Lectures and practice. Must be taken with IP/Lang 1A, B, C.

**IP/Lang 2A-B-C. Second-Year Korean: Korean Conversation (2-2-2)**

Tutorial meetings to practice Korean conversation. Must be taken with IP/Lang 2AX, BX, CX. *Prerequisite: IP/Lang 1C and 1CX or equivalent.*

**IP/Lang 2AX-BX-CX. Second-Year Korean: Analysis of Korean (3-3-3)**

A continuation of IP/Lang 1A, B, C. Through lecture and practices, students will review the basic structure of Korean and will be introduced to an intermediate-level analysis of Korean structure. Must be taken with IP/Lang 2A, B, C. *Prerequisite: IP/Lang 1C and 1CX or equivalent.*

**IP/Lang 100A-B-C. Third-Year Korean (4-4-4)**

A continuation of Second-Year Korean. For students who wish to further develop their communicative skills through improving their comprehension, speaking, reading, and writing abilities in Korean. Sino-Korean characters will be introduced in this course. *Prerequisites: IP/Lang 2C and 2CX or equivalent.*

**IP/Lang 401-406-411. Chinese Language for Professional Proficiency (4-4-4)**

This course is designed to enable students at a *low-intermediate* level of proficiency to maintain and improve their Chinese language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or consent of instructor.*

**IP/Lang 402-407-412. Japanese Language for Professional Proficiency (4-4-4)**

This course is designed to enable students at a *low-intermediate* level of proficiency to maintain and improve their Japanese language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or consent of instructor.*

**IP/Lang 403-408-413. Spanish Language for Professional Proficiency (4-4-4)**

This course is designed to enable students at a *low-intermediate* level of proficiency to maintain and improve their Spanish language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or consent of instructor.*

**IP/Lang 416-417-418. Chinese Language for Professional Proficiency (4-4-4)**

This course is designed to enable students at an *advanced-beginning* level of proficiency to maintain and improve their Chinese language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or consent of instructor.*

**IP/Lang 421-426-431. Chinese Language for Professional Proficiency (4-4-4)**

This course is designed to enable students at an *intermediate* level of proficiency to maintain and improve their Chinese language skills through a combination of classes, language labo-

ratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or consent of instructor.*

**IP/Lang 422-427-432. Japanese Language for Professional Proficiency (4-4-4)**

This course is designed to enable students at an *intermediate* level of proficiency to maintain and improve their Japanese language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or consent of instructor.*

**IP/Lang 423-428-433. Spanish Language for Professional Proficiency (4-4-4)**

This course is designed to enable students at an *intermediate* level of proficiency to maintain and improve their Spanish language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or consent of instructor.*

**IP/Lang 441-446-451. Chinese Language for Professional Proficiency (4-4-4)**

This course is designed to enable students at an *advanced-intermediate* level of proficiency to maintain and improve their Chinese language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or consent of instructor.*

**IP/Lang 442-447-452. Japanese Language for Professional Proficiency (4-4-4)**

This course is designed to enable students at an *advanced-intermediate* level of proficiency to maintain and improve their Japanese language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or consent of instructor.*

**IP/Lang 443-448-453. Spanish Language for Professional Proficiency (4-4-4)**

This course is designed to enable students at an *advanced-intermediate* level of proficiency to maintain and improve their Spanish language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or consent of instructor.*

**IP/Lang 461-466-471. Chinese Language for Professional Proficiency (4-4-4)**

This course is designed to enable students at an *advanced* level of proficiency to maintain and improve their Chinese language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or consent of instructor.*

**IP/Lang 462-467-472. Japanese Language for Professional Proficiency (4-4-4)**

This course is designed to enable students at an *advanced* level of proficiency to maintain and improve their Japanese language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or consent of instructor.*

**IP/Lang 463-468-473. Spanish Language for Professional Proficiency (4-4-4)**

This course is designed to enable students at an *advanced* level of proficiency to maintain and improve their Spanish language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or consent of instructor.*

**IP/Lang 481-486-491. Chinese Language for Professional Proficiency (4-4-4)**

This course is designed to enable students at the *highest* level of proficiency to maintain and improve their Chinese language skills through individual training with an instructor. *Prerequisite: IR/PS majors only, or consent of instructor.*

**IP/Lang 482-487-492. Japanese Language for Professional Proficiency (4-4-4)**

This course is designed to enable students at the *highest* level of proficiency to maintain and improve their Japanese language skills through individual training with an instructor. *Prerequisite: IR/PS majors only, or consent of instructor.*

**IP/Lang 483-488-493. Spanish Language for Professional Proficiency (4-4-4)**

This course is designed to enable students at the *highest* level of proficiency to maintain and improve their Spanish language skills through individual training with an instructor. *Prerequisite: IR/PS majors only, or consent of instructor.*

**IP/Lang 500. Apprentice Teaching of Language (1-4)**

This course, designed for graduate students serving as teaching assistants, includes discussion of teaching theories, techniques, and materials, conduct of discussion sessions, and participation in examinations, under the supervision of the instructor in charge of the course. *Prerequisite: graduate standing.*

**PH.D. LEVEL COURSES**

**IP/Gen 200. Theory of International Relations: International System (4)**

This course examines the concepts of international structure and system in the field of international relations. It covers the literatures on realism, neorealism, world systems theory, and other system-level explanations of patterns of international conflict and cooperation, continuity and change.

**IP/Gen 201. Theory of International Relations: The Unit in the International System (4)**

This course reviews the literature on the role of states and other actors in the international system. Issues to be discussed include: the domestic sources of foreign policy and the degree to which changes in the characteristics of the units of a system change the system itself.

**IP/Gen 202. Political Dimensions of International Finance (4)**

Examination of effects of national policies and international collaboration of public and private international financial institutions, in particular management of international debt crises, economic policy coordination, and the role of international lender of last resort.

**IP/Gen 203. Research Seminar on the Pacific Rim (4)**

Examination of research strategy formulation. Student papers written for each meeting will raise basic strategic policy questions and propose viable answers. Class evaluation of presented research strategies will investigate alternative methods for examining the underlying questions and proposed solution.

**IP/Gen 204. International Relations of the Pacific (4)**

International relations and developing international political economies of nations bordering the Pacific. Topics include: the "Pacific Basin" concept; the U.S. and "hegemonic-stability" theory; legacies of the Korean War and Sino-Soviet dispute; immigration patterns and their consequences; and Japan's foreign policy.

**IP/Gen 205. International Security (4)**

Examination of the origins, character, and consequences of fundamental security dilemmas of states and possible means of resolution. Phenomena explored include: causes of war and conditions of peace; arms races; deterrence; balance of power; alliances; security regimes; and current U.S. strategic debate.

**IP/Gen 210. International Politics (4)**

Introduction to international politics focusing on the rise and demise of the Cold War. Combines postwar diplomatic history with the core concepts and analytical approaches of interna-

tional relations. Emphasizes the interplay between structure and strategy.

**IP/Gen 211. The Politics of International Economic Relations (4)**

The course presents explanations for the political organization of international economic relations in different issue-areas. Additional topics include international economic inequality, efforts by states to manipulate economic relations for strategic gain, and the prospects for regional and global organizations.

**IP/Gen 212. The Politics of International Competitiveness (4)**

Examination of policy debates concerning international economic relations: what policies promote or encourage effective participation in the international economy, and what political factors support or oppose such policies? Examples drawn from the experiences of the U.S., Japan, Europe, Latin America, and East Asia.

**IP/Gen 214. U.S. Strategic Policy Issues in a Changing World (4)**

Strategic issues facing the U.S. in the nineties will be described and analyzed. Issues taken up will include nuclear weapons policy, space policy, European and Northeast Asia security policies. Political, military, and technical aspects of these issues will be analyzed. *Prerequisites: graduate status or consent of instructor. Some background in political science and in quantitative analysis of issues desirable.*

**IP/Gen 220A-B-C. Research Seminar: Applied Economic Research (2-2-2)**

A three-quarter sequence course consisting of special topics in empirical research and applied econometrics. Each student will be supervised in work on a major empirical project. Empirical research undertaken will be original and designed to give training in the application and integration of theoretical and econometric tools. The topic researched will be related to the Pacific region; and as a result, the student will gain in-depth experience with Pacific data sources. The paper will be presented before the Graduate Policy Seminar. *Prerequisite: successful completion of first year, doctoral level, IR/PS economic course requirements.*

**IP/Gen 221. Managerial Economics (4)**

Survey of basic tools in economics. Examination of how commodity demand is determined, what affects supply of the commodity, how price is determined, when optimal market allocation of resources and failures occurs, and basic topics concerning the aggregate economy.

**IP/Gen 222. Investments (4)**

An analysis of the risk/return characteristics of different assets as perceived by different investors and their implications for security price behavior, emphasizing real world capital market behavior. International aspects include the role of exchange rate risk and international diversification.

**IP/Gen 223. Industrial Organization (4)**

The interactions among firms and between firms and consumers. How firms compete and collude. The efficiency implications of different market institutions. Public policy toward industry.

**IP/Gen 224. Corporate Finance (4)**

The topics covered are dividend policy and capital structure, options, debt financing, and short- and long-term in financial planning. Course format will be mostly lectures with occasional cases. Some international aspects of corporate finance will also be discussed.

**IP/Gen 231. Fiscal and Monetary Policy (4)**

Effects of fiscal and monetary policies on aggregate variables such as output, nominal and real interest rates, price level, and employment. Additional topics include the inflation/unemployment trade-off, budget deficit, and economic growth.

**IP/Gen 232. The Firm in Global Competition (4)**

The theory of the gains from international trade is used for understanding current issues in trade policy. Then the viewpoint switches from country to firm: What gives firms an edge in international competition? How does firm organization vary across countries?

**IP/Gen 233. International Finance (4)**

The international financial system will be addressed including the perspectives of individual investors, borrowers, and financial intermediaries. Public policy issues including the exchange rate mechanism, financial linkages among countries, optimum currency areas, and macro-policy coordination will be discussed.

**IP/Gen 234. Strategic Analysis (4)**

This course analyzes competitive interactions, surveying the modern economic analysis of relationships between and within organizations. The foundations of the course are game theory and the economics of information. Topics include bargaining and contracting; principal-agent models; and bidding models.

**IP/Gen 235. Advanced Topics in International Trade (4)**

Assumes student participants have a background in basic theories of international trade. Introduction to advanced theories and current topics in international trade, including technological transfer between countries, trade patterns between North and South, etc.

**IP/Gen 236. Public Finance: Taxation (4)**

A survey of taxation theory and institutions. Effect of taxation on efficiency and income distribution. Deficit financing and the burden of the debt. Tax system and structure of the U.S. and other Pacific Rim countries.

**IP/Gen 237. Strategy and Planning in Production and Operations Management (4)**

This course examines manufacturing, distribution, and service activities that are relevant to the strategic management of operations. It explores the everyday control of operations, the design of the production system, and the interface between operations and other aspects of the firm's overall strategy.

*Prerequisite: IP/Gen 238, or consent of instructor.*

**IP/Gen 238. Production and Operations Management: Analysis and Control (4)**

This course provides a comprehensive introduction to the fundamental decisions and trade-offs associated with the control of a firm's operations function. It analyzes production processes, quality control, inventory and materials planning, kanban and just-in-time principles.

**IP/Gen 239. International Manufacturing Strategy: Selected Topics (4)**

This course covers selected issues emerging from the recent trends in globalization of firms' manufacturing activities. Topics include globalization of manufacturing base, international comparison of manufacturing management, the role of manufacturing in the global competition. *Prerequisite: IP/Gen 238 or consent of instructor.*

**IP/Gen 241. Seminar in Advanced Topics in Production and Operations Management (4)**

Studies of advanced analytical techniques in operations management. Emphasis is on the application of various analytical methods to operational problems. Students are encouraged to carry out a research project for the actual applications of these techniques. *Prerequisite: IP/Gen 238 or consent of instructor.*

**IP/Gen 243. International Economics (4)**

The theory and mechanics of international economics. Included will be such topics as real trade theory, international movements of capital, the effects of trade and capital flows on domestic economies, and policies toward trade and foreign investment.

**IP/Gen 251. Economic Development (4)**

Comparative patterns of industrialization and agricultural modernization. Stresses on certain common features of the modernization process and widely varying endowments, policies, and experiences of different countries.

**IP/Gen 254. Comparative Welfare States/Social Policies (4)**

Growth of the welfare state in advanced industrial societies, current tensions and transformations in contemporary welfare states. Empirical focus on social security, health, welfare, and labor market policies in Britain, Sweden, Germany, Canada, and the U.S. Conjoined with Sociology 247.

**IP/Gen 255. Technology and Trade in Economic Growth (4)**

Examination of the latest research on economics of technological change, role of trade in economic growth, and determinants of economic growth. Focus will be on structures and policies that support or impede growth in different regions.

**IP/Gen 256. Program Design and Evaluation (4)**

Introduction to elements of program design and evaluation. Examines principles and guidelines used in creating a program and evaluating its success or failure. International case studies are explored. Students have the opportunity to develop their own program and evaluation projects.

**IP/Gen 257. Policy Analysis (4)**

Examination of public policy analysis, such as cost-benefit analysis and project evaluation, for use in policy formation. Sustainable development will receive particular attention. Case studies emphasizing the environment, agriculture and food, and economic development will be included.

**IP/Gen 258. International Environmental Policy (4)**

Review of environmental issues, including transboundary air and water pollution, acid rain, ozone depletion, species eradication, whaling, and climate change. Economic, political, and social consequences of international environmental disputes. Current approaches to environmental policy analysis.

**IP/Gen 259. Conflict Resolution of Environmental Issues (4)**

Use of bilateral negotiations (U.S.-Canada), regional organization (ECE and acid rain in Europe), and United Nations' specialized agencies (UNEP and WMO on ozone depletion and climate change) to mediate environmental disputes. Consideration of nontraditional approaches resolving international environmental problems.

**IP/Gen 260. Economic and Social Development of China (4)**

This course examines China's development experience from a generally economic standpoint. Contents include: patterns of traditional Chinese society and economy; geography and resource constraints; impact of the West and Japan; development since 1949; and contemporary problems and options.

**IP/Gen 261. Chinese Politics (4)**

This course will analyze post-1949 Chinese politics, including political institutions, the policymaking process, and citizen political behavior. Special attention will be given to the prospects for political reform in China.

**IP/Gen 262. Theories of the Politics and Process of Making Public Policy (4)**

Introduction to research methods in comparative policy analysis and to the design of research proposals. Survey of major competing approaches in the field, with analysis of methods used. Special attention to needs of Ph.D. students formulating dissertation proposals.

**IP/Gen 265. Economy of China (4)**

Survey and assessment of China's economic development since 1949. Section on agriculture; industry; foreign trade; and finan-

cial and macroeconomic problems. Economic analysis of the state-dominated mixed economy emerging from current reforms.

**IP/Gen 266. Chinese Foreign Policy (4)**

Examination of Chinese perceptions of the world, domestic sources of foreign policy, military and security issues, foreign trade, and cultural ties. Relations with the two superpowers will be emphasized. Relations with Japan and the Third World will also be covered.

**IP/Gen 270A. Modern Japanese Political Economy and Decision Making (4)**

An advanced-level survey of modern Japanese political and economic development since the Meiji Restoration, with attention to some of the main controversies concerning Japan, including the place of Japanese culture in Japan's achievements, the failure of prewar democracy and the rise of militarism, and continuities between prewar and postwar Japan.

**IP/Gen 270B. Modern Japanese Political Economy and Decision Making (4)**

An analysis of the core institution in Japanese society (ruling party, bureaucracy, and *zaikai* [big business]) and how they interact with each other. Attention will also be given to the changing place of law in the Japanese system and to the costs and benefits of Japanese innovations in management and labor relations. *Prerequisite: IP/Core 434A.*

**IP/Gen 271. Japanese Economy (4)**

A broad survey of the Japanese economy, together with in-depth examination of some distinctively Japanese phenomena such as savings behavior, financial structure, industrial organization, and labor markets.

**IP/Gen 272. Japanese Corporate Culture (4)**

This course examines Japanese cultural values and social relations in the context of business organizations. The central focus will be on the integration of individuals into their organizations and on the human relations characteristics of their work environments.

**IP/Gen 273. Japan's Foreign and Defense Policies (4)**

Examination of major issues in the evolution of Japan's foreign and defense policies. Emphasis will be given to the analytical considerations and policy interests in the management of Japan's foreign relations.

**IP/Gen 274. Economic Policy in Latin America (4)**

This course seeks to enhance the students' understanding of the main policy alternatives open to the largest Latin American countries. Development and stabilization policies are analyzed, emphasizing current debate between conventional and heterodox policy packages and their impact on decision making.

**IP/Gen 275. Politics and Policy in Latin America (4)**

An overview of the contemporary politics in Latin America: democracy, authoritarianism, and revolutionary change. Readings will be mostly comparative, either dealing with groups of countries within Latin America or comparisons between Latin America and other regions of the world.

**IP/Gen 277. Latin American Politics (4)**

Introductory reading seminar on Latin American politics to acquaint students with leading schools of thought, provide critical perspective on premises and methodology, and identify themes for further inquiry. Themes include authoritarianism, revolution, democratization, regional conflict, and emergence of middle-level powers. (Conjoined with Political Science 235A.)

**IP/Gen 278. Mexican Economic Policy (4)**

This course offers an overview of economic policy in Mexico. It covers the shift from "stabilizing growth" in the 1950s and 1960s to crisis in the 1970s and 1980s and current reforms. International interactions and current developments are stressed.



## ITALIAN STUDIES

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### **IP/Gen 279. Health Policy Development in Mexico and Latin America: Implications for U.S.-Mexican Immigration and Border Relations (4)**

Analysis of health policies in Mexico and Latin America with special reference to consequences for the United States. Focus on country cases, international migration, and the U.S. border region.

### **IP/Gen 280A-B-C. Research Seminar: Comparative Analysis of Political Decision Making (4-4-4)**

This course aims to develop theoretical approaches to the study of policymaking in the countries of the Pacific region, including China, Japan, Korea, Taiwan, Hong Kong, Singapore, Latin America, and Canada. The focus is on political institutions and how they structure collective choice and incentives for individual behavior. Participants will research case studies of policymaking and present their findings to the class. As a group, they will also contribute to the process of generating theories about the consequences of different institutional arrangements for policy outcomes.

### **IP/Gen 281A-B-C. Graduate Policy Seminar (4-4-4)**

All doctoral candidates must participate in this three-quarter sequence. This seminar will bring together advanced Ph.D. students and faculty to discuss policy issues in the Pacific region. The course will require students to make presentations of literature reviews, research papers, and a dissertation prospectus.

### **IP/Gen 282. East Asian NICS (4)**

Forces explaining the success of four economies in East Asia (South Korea, Taiwan, Hong Kong, Singapore), and two natural resource-rich states (Malaysia, Thailand) will be addressed. Theoretical models, implementation of development policies/strategies, and sociopolitical causes and consequences of development will be discussed.

### **IP/Gen 283. Comparative Economic Systems (4)**

Economic systems and their transformation in developed and developing countries. Socialism and the transition from central planning to the market. Capitalism and government intervention to foster growth or equity. Coverage may include Russia, Japan, Poland, Sweden, and Brazil.

### **IP/Gen 284. Korean Politics and Society (4)**

This course will examine characteristics and distinctive aspects of contemporary Korean society and politics. Emphasis will be placed on continuity and change in social values, political culture and leadership, economic growth and its impact, and democratization and its future prospects.

### **IP/Gen 285. The Political Economy of South Korea (4)**

Analytical review of South Korea's economic performance. Examination of major policy changes (e.g., shifts toward export-promotion, heavy and chemical industrial promotion); Korea's industrial structure including the role of large enterprise (*chaebol*); role of government; links between Korea and other countries.

### **IP/Gen 290. Special Topics in Pacific International Affairs (4)**

A seminar course at an advanced level on a special topic in Pacific international affairs. May be repeated for credit.

### **IP/Gen 291. Stabilization, Reform, and Internationalization in the World Economy (4)**

This course offers a comparative perspective on economies' adaptation to the environment of the nineties. It focuses on international financial change, macrostabilization, and long-term reform in the Pacific Rim and Europe.

### **IP/Gen 298. Directed Group Study (2-12)**

Directed reading in a selected area. The content of each course is to be decided by the professor directing the course, with the approval of the student's faculty adviser.

### **IP/Gen 299. Independent Research (2-12)**

Independent research under the guidance of a faculty member in IR/PS.

## ITALIAN STUDIES

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OFFICE: 3071 Humanities and Social Sciences Building, Muir College (CAESAR Office)

### **Professor**

Robert Westman, Ph.D., *History*

### **Associate Professors**

Jack Greenstein, Ph.D., *Visual Arts*

John Marino, Ph.D., *History*

Stephanie Jed, Ph.D., *Italian and Comparative Literature*

Jon R. Snyder, Ph.D., *Italian and Comparative Literature*

### **Assistant Professors**

Pamela Radcliffe, Ph.D., *History*

Pasquale Verdicchio, Ph.D., *Italian and Comparative Literature*

Adrienne von Lates, Ph.D., *Visual Arts*

Italian studies is an interdisciplinary program in the language, literature, history, and art of Italy. Italian studies coordinates the resources of the Departments of History, Literature and Visual Arts, and offers students the opportunity to design a major, leading to a B.A., around the course offerings of these three departments. Students in Italian studies are encouraged to participate in the University of California Education Abroad Program (EAP), which is affiliated with the Universities of Padua, Venice, and Bologna: this provides the possibility of a junior year abroad, including both language courses and courses dealing with various aspects of Italian studies. EAP credits may be transferred back to UCSD to coordinate with on-campus offerings.

## THE MAJOR PROGRAM

A major in Italian studies consists of a choice of twelve upper-division courses in literature, history, and visual arts approved for the program and listed below. Each of the three areas (literature, history, and visual arts) must be represented in the student's program of study, with at least two courses from each field. The particular courses making up each student's major will be selected in consultation with the program adviser. Literature 115 (Dante) is a required course for all Italian studies majors. In the senior year, each student is required to take a directed readings tutorial (199) and write an essay under the supervision of the chosen instructor.

## THE MINOR PROGRAM

A minor in Italian studies consists of six upper-division courses from among those listed below (two each from literature, history, and visual arts). Credit for three courses from the EAP program may be applied toward the minor.

Additional courses counting toward a major in Italian studies are offered on a year-to-year basis. As these often cannot be listed in the catalog in advance, interested students should consult the program faculty for an up-to-date list.

## UPPER-DIVISION/ITALIAN STUDIES COURSES

For description of courses listed below, see appropriate departmental listing.

### **Literature**

Lit/It 100. Introduction to Italian Literature

Lit/It 161. Advanced Stylistics and Conversation

Lit/It 122. Studies in Modern Italian Culture

Lit/It 136. Studies in Modern Italian Poetry

Lit/It 137. Studies in Modern Italian Prose

Lit/It 110. Selected Topics in Italian Literature (may be repeated for credit as topics vary)

Lit/It 115. Dante: The *Divina Commedia*

Lit/It 190. Seminar

Lit/It 198. Directed Group Study

Lit/It 199. Special Studies

N.B.: A prerequisite for all upper-division work in Italian literature, for majors in the Italian Studies Program, is the first- and second-year language sequence (Italian 1A-B-C, 2A-B, 50).

### **Visual Arts**

123A. Italian Art of the Early Renaissance

123B. High Renaissance Art

123C. Michelangelo

123D. The City in Italy

128C. Topics in Medieval, Renaissance, and Baroque Art (when on an Italian topic)

129C. Special Problems in Medieval, Renaissance, and Baroque Art (when on an Italian topic)

### **History**

120. Early Renaissance Italy: Dante to the Medici (1300-1494)

121. Late Italian Renaissance: Age of Michelangelo (1494-1564)

122. Politics, Italian Renaissance Style

152. Italy Since 1860

199. Independent Study for Undergraduates



## JAPANESE STUDIES

OFFICE: 3071 Humanities and Social Sciences Building, Muir College

### Faculty

Takeo Hoshi, *Assistant Professor, International Relations and Pacific Studies*

Chalmers Johnson, *Rohr Professor of Pacific International Relations*

Hifumi Ito, *Lecturer, Japanese Language*

Noriko Kikuchi, *Lecturer, Japanese Language*

Emiko Kiyochi, *Lecturer, Japanese Language*

Sige-Yuki Kuroda, *Professor, Linguistics*

Masao Miyoshi, *Hajime Mori Professor of Japanese, English, and Comparative Literature*

Masato Nishimura, *Lecturer, Japanese Language*

Frances Rosenbluth, *Assistant Professor, International Relations and Pacific Studies*

Yasu-Hiko Tohsaku, *Associate Professor, International Relations and Pacific Studies*

Christena Turner, *Assistant Professor, Sociology*

Joji Yuasa, *Professor, Music*

The Program in Japanese Studies coordinates a variety of campus offerings dealing with the language, history, culture, and political economy of Japan. The program is especially strong in the area of modern and contemporary Japan. In addition to courses available in the Departments of Anthropology, Economics, History, Linguistics, Literature, Music, Political Science and Sociology, qualified undergraduates also may enroll in Japan-related courses in the Graduate School of International Relations and Pacific Studies with consent of instructors.

### THE MINOR PROGRAM

A minor in Japanese studies consists of six courses, at least three of which are upper-division. The courses must be taken in at least two different departments other than language, and approved by the student's college as well as the Program in Japanese Studies. Three quarters of Japanese language courses are required, and may be used to satisfy the minor requirements as lower-division courses. All courses must be taken for a letter grade.

### Courses

(All graduate-level courses require permission of the instructor for undergraduate students.)  
(Course titles may vary from year to year.)

### ■ ANTHROPOLOGY

ANTH 49. Japanese Culture and Society

ANRG 112. Femininity and Masculinity in Japan

ANRG 122. Japanese Psychology and Psychotherapies

ANRG 146. Everyday Religiosity in Japan

ANRG 167. Japanese Popular and Mass Culture

ANRG 257. Ethnographies of Japan

### ■ HISTORY

HIEA 80. Japan to 1600

HIEA 81. Japan since 1600

HIEA 110. Ancient Japan and the Courtly Society

HIEA 111. Japan in the Age of the Samurai

HIEA 112. Japan's Emergence as a Modern State

HIEA 113. Pearl Harbor and Hiroshima: World War Two in Asia

HIEA 114. Occupied Japan and the Cold War in Asia

HIEA 160. Colloquium on Modern Japanese History

### ■ LANGUAGE

(All courses are offered annually. The 'A' courses are offered in the fall, 'B' in winter, and 'C' in spring only.)

10A-B-C. First-Year Japanese

*Prerequisites for 'B' and 'C': previous course or consent of instructor.*

20A-B-C. Second-Year Japanese

*Prerequisites: previous course or consent of instructor.*

100A-B-C. Written Japanese

*Prerequisite for 'A': consent of instructor. Prerequisites for 'B' and 'C': previous course or consent of instructor.*

130A-B-C. Third-Year Japanese

*Prerequisites: previous course or consent of instructor.*

140A-B-C. Fourth-Year Japanese

*Prerequisites: previous course or consent of instructor.*

### ■ LINGUISTICS

146. Structure of Japanese

### ■ LITERATURE

Lit/Gen 142. Earlier Japanese Literature in Translation

(Quarter offerings will vary among A. General Literature; B. Poetry; C. Prose Fiction; D. Drama; and E. Essays, travelogues, diaries, etc.)

Lit/Gen 143. Later Japanese Literature in Translation

(Quarter offerings will vary among A. General Literature; B. Poetry; C. Prose Fiction; D. Drama and Film; and E. Essays, criticism, etc.)

Lit/Gen 144. A Single Japanese Author (in translation)

Lit/Gen 145. Special Topics in Japanese Literature  
Lit/Gen 146. Japanese Literary Works/Writers in Japanese

Lit/Th 240. Forms and Genres (Check with program office as to whether this course may be used towards a Japanese studies minor.)

### ■ MUSIC

(Check with program office as to whether these courses may be used towards a Japanese studies minor.)

111. World Music.

211. Seminar in World Music

### ■ POLITICAL SCIENCE

133A. Introduction to Japanese Politics

133D. Japanese Foreign Policy

133E. Public Policy in Japan

233. Politics and Political Economy in Contemporary Japan

### ■ SOCIOLOGY

188G. Japanese Organizational Culture

### ■ GRADUATE SCHOOL OF INTERNATIONAL RELATIONS AND PACIFIC STUDIES

IP/Gen 400. International Relations of the Pacific

IP/Gen 471. Japanese Economy

IP/Gen 472. Cultures of Japanese Business Organizations

IP/Core 434A-B. Modern Japanese Political Economy

IP/Core 473A-D, 474A-D, 475A-D. Japanese Language Maintenance for Professional Proficiency

## JUDAIC STUDIES

OFFICE: 4008 Humanities and Social Sciences Building, Muir College

### Professors

David Noel Freedman, Ph.D., *History; Endowed Chair, Biblical Studies*

Richard Elliot Friedman, Th.D., *Hebrew and Comparative Literature*

David M. Goodblatt, Ph.D., *History*

Melford Spiro, Ph.D., *Anthropology*

### Associate Professors

Jonathan Saville, Ph.D., *Theatre*

Gershon Shafir, Ph.D., *Sociology*

### Assistant Professor

William H. Propp, Ph.D., *History; Coordinator*

The Judaic Studies Program is an interdisciplinary program offering courses, majors,

## LATIN AMERICAN STUDIES

minors, and concentrations in Judaic studies which draw upon a variety of perspectives. Courses are offered in the Departments of Anthropology, History, Literature, Political Science, Philosophy, and Sociology.

### MAJOR

Requirements for the major in Judaic studies are:

1. Judaic Cultural Traditions 1A-B-C.
2. Twelve upper-division courses in Judaic studies, to be selected in consultation with a faculty adviser.
3. Upper-division competence in Hebrew, normally to be fulfilled by completion of first- and second-year Hebrew language courses, or equivalent.

Students whose principal interest is in Judaic studies also have the following options:

1. Within the Classical Studies Program, students may pursue a major concentrating upon Hebrew/biblical courses offered in the Departments of Literature, History, and Philosophy.
2. Within the general literature major in the Department of Literature, students may concentrate on Judaic literature or on a combined program of Judaic and classical literature.

In addition, Revelle and Muir Colleges have noncontiguous minors in Judaic studies and in Hebrew language and literature; Warren College has Judaic studies and Hebrew literature concentrations; and various general requirements in all colleges can be met by courses in the Judaic area. For details students should inquire at their provost's office or at the Judaic Studies Program office.

UCSD students are eligible for participation in the UC Education Abroad Programs in Jerusalem and Haifa.

### Courses

Following are course offerings in this area. For descriptions of the courses listed below, refer to the appropriate department's section of the catalog.

#### **Cultural Traditions: Judaic 1A-B-C. (4-4-4)**

(Also listed as Philosophy 30A-B-C.)

An introductory survey of the Jewish people and Jewish civilization from the Bible to the present day.

#### **Judaic Studies 1. Beginning Hebrew (4)**

Acquisition of basic vocabulary, fundamentals of Hebrew grammar, conversation, and reading.

#### **Judaic Studies 2. Intermediate Hebrew (4)**

Continued study of vocabulary and grammar, emphasis on fluency in conversation, and reading.

#### **Judaic Studies 3. Intermediate Hebrew, Continued (4)**

Vocabulary, grammar, conversation, introduction to literary and nonliterary texts.

#### **Judaic Studies 101. Introduction to Hebrew Texts (4)**

Reading and analysis of texts from Biblical through modern authors, study of advanced vocabulary and grammar. Course taught in Hebrew and in English.

#### **Judaic Studies 102. Intermediate Hebrew Texts (4)**

Further reading and analysis of Hebrew literature from a range of periods. Advanced grammar and vocabulary. Course taught in Hebrew and in English.

#### **Judaic Studies 103. Advanced Hebrew Texts (4)**

Synthesis of fluency, reading, and grammatical skills. Reading of texts from a range of periods.

#### **Judaic Studies 105. Modern Jewish Thought (4)**

#### **ANGN 141. Religion and Society (4)**

#### **ANGR 189. Zionism as a Social Movement (4)**

#### **HIEU 145. European Jewry: 1750-1880 (4)**

#### **HINE 100. The Ancient Near East and Israel (4)**

#### **HINE 101. Hebrew Prophetic Literature (4)**

#### **HINE 102. The Jews in Their Homeland in Antiquity (4)**

#### **HINE 103. The Jewish Diaspora in Antiquity (4)**

#### **HINE 104. The Bible and the Ancient Near East (4)**

#### **HINE 108. The Middle East before Islam (4)**

#### **HINE 160/260. Special Topics in the Bible and Ancient Near East (4)**

#### **HINE 166/266. Nationalism in the Middle East (4)**

#### **HINE 170/270. Special Topics in Jewish History (4)**

#### **HINE 199. Independent Study in Near Eastern History (4)**

#### **HITO 100. Religious Traditions: Ancient Near Eastern Religions (4)**

#### **HITO 101. Religious Traditions: Judaism, Christianity, Islam (4)**

#### **HIGR 260. Seminar in the Hebrew Bible.**

#### **HIGR 261A-B-C. Seminar in Judaic Studies (4-4-4)**

#### **HIGR 298. Directed Reading (1-12)**

#### **HIGR 299. Thesis Direction (1-12)**

#### **HIGR 500. Apprentice Teaching (1-40)**

#### **Lit/He (Lit/Gen) 148. The Bible and Western Literature (4)**

#### **Lit/Gen 149. The Jewish Experience in Literature (4)**

#### **Lit/Gen 150. Jewish Mysticism (4)**

#### **Lit/He (Lit/Gen) 151. Bible: The Prophetic Books (4)**

#### **Lit/He (Lit/Gen) 152. Bible: The Narrative Books (4)**

#### **Lit/He (Lit/Gen) 153. Bible: The Poetic Books (4)**

#### **Lit/He (Lit/Gen) 154. Medieval Hebrew Literature (4)**

#### **Lit/He (Lit/Gen) 155. Hebrew Literature: The Modern Period (4)**

#### **Lit/He (Lit/Gen) 156. Topics in the Prophets (4)**

#### **Lit/He (Lit/Gen) 157. Topics in Biblical Narrative (4)**

#### **Lit/He (Lit/Gen) 158. Topics in Biblical Poetry (4)**

#### **Lit/Gen 120. Yiddish Literature in Translation (4)**

#### **Lit/He 190. Seminars (4)**

#### **Lit/Gen 195. Apprentice Teaching (0 and 4)**

Courses cross-listed as Lit/He and Lit/Gen may be taken as Hebrew literature by students proficient in the language or as general literature by students without knowledge of Hebrew.

#### **Lit/He 197. Field Study: Archaeology and the Bible (4 to 8)**

(Offered in Summer Session)

#### **Lit/He 198. Directed Group Study (4)**

#### **Lit/He 199. Special Studies (4)**

#### **Lit/Co 297. Directed Studies (4)**

#### **Lit/Co 298. Special Projects (4)**

#### **Philosophy 160. Philosophy of Religion (4-4)**

#### **Philosophy 161. Religious Existentialism (4)**

#### **Political Science 121A and 121B. Governments and Politics of the Middle East (4-4)**

#### **Political Science 121C and 121D. The Arab-Israeli Conflict (4-4)**

#### **Sociology 156. Sociology of Religion (4)**

#### **Sociology 157. Religion in Contemporary Society (4)**

#### **Sociology 188F. Modern Jewish Societies and Israeli Society (4)**

## LANGUAGE

See particular languages under linguistics (beginning and intermediate) or literature (advanced).

## LATIN AMERICAN STUDIES

OFFICE: 117 Institute of the Americas Building

#### **Professors**

George Borjas, Ph.D., *Economics*

Jaime Concha, Ph.D., *Literature*

Wayne Cornelius, Ph.D., *Political Science*

Paul Drake, Ph.D., *Political Science/History*

Ramon Gutierrez, Ph.D., *History*  
 David Ringrose, Ph.D., *History*  
 Peter H. Smith, Ph.D., *Political Science*,  
*Program Chair*  
 Carlos Waisman, Ph.D., *Sociology*

**Adjunct Professor**

Joseph Grunwald, Ph.D., *Economics*

**Associate Professors**

Rae Blumberg, Ph.D., *Sociology*  
 Ann Craig, Ph.D., *Political Science*  
 Dee Dee Hallek, B.A., *Communication*  
 Daniel Hallin, Ph.D., *Communication*  
 Jorge Huerta, Ph.D., *Theatre*  
 David Mares, Ph.D., *Political Science*  
 Michael Monteon, Ph.D., *History*  
 Marta Sanchez, Ph.D., *Literature*  
 Rosaura Sanchez, Ph.D., *Literature*  
 Harley Shaiken, B.A., *Communication*  
 Eric Van Young, Ph.D., *History*  
 Leon Zamosc, Ph.D., *Sociology*

**Assistant Professors**

Juan Diez-Medrano, Ph.D., *Sociology*  
 James Holston, Ph.D., *Anthropology*  
 Christine Hunefeldt, Ph.D., *History*  
 Graciela Kaminsky, Ph.D., *Economics*  
 Luis Rivera-Bátiz, Ph.D., *International  
 Relations and Pacific Studies*  
 Matthew Shugart, Ph.D., *International  
 Relations and Pacific Studies*  
 Marcelo Suarez-Orozco, Ph.D., *Anthropology*

**MINOR IN LATIN AMERICAN STUDIES**

Language prerequisite: successful completion of two years of college-level Spanish or Portuguese (or the equivalent thereof).

In addition to the language prerequisite, a minor in Latin American studies consists of six courses, of which at least three must be upper-division courses dealing with Latin America. The remaining three courses may be at the lower- or upper-division level. All six courses must focus on Latin America or provide instruction in Spanish-American literature or in the Portuguese language. No more than three of the courses can be taken in any single department.

All six courses must be taken for a letter grade. Approved courses taken at other universities or through participation in the Education Abroad Program may be included as part of the minor. Courses for the minor must be approved by the student's college and by the Committee on Latin American Studies.

The following is a list of courses approved to satisfy these requirements:

**ANTHROPOLOGY**

- 100: Power and Resistance
- 102: Latin American Societies and Cultures
- 125: Contemporary Central America
- 134: The Cultures of Mexico
- 145: Topics in Latin American Societies and Cultures

**ECONOMICS**

- 161: Latin American Economic Development

**ETHNIC STUDIES**

- 133: Hispanic American Dramatic Literature
- 134: La Chicana
- 180: Topics in Mexican-American History

**HISTORY**

- 100: Colonial Latin America: Era of Conquest
- 101: Colonial Latin America: The Mature Colonies
- 102: Latin America in the Twentieth Century
- 105: South America: Labor, Coercion, and the Society in the Nineteenth Century
- 110: Progress and Poverty in South America: 1820-1930
- 111: Progress and Poverty in South America: 1930-Present
- 112: Economic and Social History of the Andean Region
- 113: Lord and Peasant in Latin America
- 114: Social History of Colonial Latin America
- 115: The Latin American City, a History
- 117: Indians, Blacks, and Whites: Family Relations in Latin America
- 120: History of Argentina
- 121: History of Brazil
- 122: Cuba: From Colony to Socialist Republic
- 131: A History of Mexico
- 132: A History of Contemporary Mexico

**Colloquia:**

- 160: Topics in Latin American Colonial History
- 161: History of Women in Latin America
- 162: Special Topics in Latin American History
- 164: The Political Economy of Argentina
- 166: Cuba: From Colony to Socialist Republic
- 170: Topics in Latin American History, 1820-1910
- 171: Special Topics in Latin American History since 1910
- 172: Machismo and Matriarchy: The Latin American Social Structure

- 199: Independent Study in Latin American History

**LINGUISTICS**

Basic Portuguese language courses

**LITERATURE**

- Lit/Gen 136: Latin American Literature in Translation
- Lit/Gen 137: Mexican Literature in Translation
- Lit/Sp 130B: Development of Latin American Literature
- Lit/Sp 131: Spanish American Literature: The Colonial Period
- Lit/Sp 132: Spanish American Literature: The Nineteenth Century
- Lit/Sp 133: Spanish American Literature: The Twentieth Century
- Lit/Sp 134: Argentine Literature
- Lit/Sp 135: Mexican Literature
- Lit/Sp 136: Peruvian Literature
- Lit/Sp 137: Caribbean Literature
- Lit/Sp 140: Spanish American Novel
- Lit/Sp 141: Spanish American Poetry
- Lit/Sp 142: Spanish American Short Story
- Lit/Sp 143: Spanish American Essay
- Lit/Sp 144: Spanish American Theatre
- Lit/Sp 163: Spanish Language in America
- Lit/Sp 164: Language and Society
- Lit/Sp 172: Indigenista Themes in Spanish-American Literature
- Lit/Sp 173: Problems in Spanish and Spanish-American Literary History

**POLITICAL SCIENCE**

- 134AA: Comparative Politics of Latin America
- 134AB: Comparative Socialist Experiments in Latin America
- 134B: Politics in Mexico
- 134C: Peasant Movements and Agrarian Problems in Latin America
- 134D: Selected topics in Latin American Politics
- 134G: Politics in the Andes
- 134I: Politics in the Southern Cone of Latin America
- 134J: Labor Politics in Latin America
- 134N: Politics in Central America
- 146A: The U.S. and Latin America: Political and Economic Relations
- 146BA-BB: Seminar in Mexico and U.S.-Mexican Relations

## LAW AND SOCIETY

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- 146D: Political Parties in Latin America  
196B-C: Fieldwork in U.S.-Mexican Studies

### SOCIOLOGY

- 188D: Latin America: Society and Politics

## MASTER'S DEGREE PROGRAM

The Faculty Graduate Group in Latin American Studies is composed of professors housed in their respective departments. The group offers an interdisciplinary M.A. in Latin American studies. That degree requires:

1. Foreign language competence in Spanish or Portuguese;
2. Forty units of course work in at least three departments, with no more than sixteen units in any one department; four of those units must be taken in the Latin American Studies Core Seminar. A list of approved courses is available from the Faculty Group in Latin American studies;
3. Either a comprehensive examination or a master's thesis.

## Courses

This course is required for Latin American studies M.A. graduate students.

### 200. Core Seminar on Interdisciplinary Research and Methodology in Latin American Studies (4)

A team-taught course wherein members of the Faculty Group in Latin American Studies present diverse disciplinary and thematic approaches to the region. Topics vary from year to year. Grades are based on discussions and on a series of analytical papers. *Prerequisite: enrollment in the master's degree program in Latin American studies.*

## LATIN LITERATURE

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See Literature.

## LAW AND SOCIETY

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OFFICE: Interdisciplinary Programs, Literature Building, Second Floor, Warren Campus

Law and society is an interdisciplinary minor that emphasizes the complexity and interrelationship of legal, social, and ethical issues in their historical context. Although it is administered by Warren College, it is available to all UCSD stu-

dents considering law-related careers or those with a general interest in law as a social institution. The purpose of the program is to enhance students' critical analysis of social and ethical issues related to law and of the legal implications and ramifications of policy and decision making in their major fields of study. Students examine the role of the legal system and specific legal issues from the perspectives of the social sciences and humanities. Social forces, historical questions, and issues of values will be considered in the context of the legal system. The focus of the minor is on the process of law—how the law both reflects and defines basic social values—and its relation to the political, economic, and social conflicts within society.

The interdisciplinary content of the law and society minor offers UCSD students the opportunity to examine law-related issues from the perspectives of a broad range of disciplines including: communication, economics, history, linguistics, philosophy, political science, psychology, sociology, and urban studies and planning. To assure an interdisciplinary learning experience, students must include in their program at least one course from each of the following academic departments: history, philosophy, political science, and sociology.

Students should consult an academic adviser in their college provost's office to determine how the law and society minor can best meet their college's graduation requirements. Students who complete the law and society course work but do not use it as a minor (or program of concentration) may have a special notation placed on their transcript certifying completion of the course work. Transcript notation requests must be obtained from and approved by the Interdisciplinary Programs Office. Declarations (forms officially designating law and society a minor and listing the specific course work selected by the student) and petitions (forms requesting changes in or exceptions from course requirements) for the law and society minor must first be reviewed and approved by the coordinator of Interdisciplinary Programs and then by the students' college academic advising office.

Students are strongly urged to supplement the law and society minor with a law-related internship. Both local and out-of-town internships are available to juniors and seniors with at least a 2.5 grade-point average through the Academic Internship Program. The Academic Internship Program offers local placements with lawyers, judges, elected officials, government offices, and public interest groups. In addition, placements are available in Washington, D.C. with senators, representatives, legislative committees, and po-

litical action committees. Students may earn from four to sixteen units of academic credit for the internship experience.

A number of extracurricular events and programs are also available to students interested in law. Warren College sponsors the annual Earl Warren Symposium dedicated to the analysis of a socially relevant legal topic. The symposium includes lectures and discussions by members of the legal community and the UCSD faculty, informal debates, student panels, and a moot court presentation. Selected students from community high schools are invited to attend, along with their instructors. The symposium is open to all UCSD students, staff, and faculty as well as to the community at large.

Information, workshops, and additional law-related programs are also offered by the Career Services Center, the student Pre-Law Education Association (PLEA), and faculty advisers in the academic departments. Further information on these programs and activities is available at the Interdisciplinary Programs Office, Literature Building, Second Floor, Warren Campus.

## LAW AND SOCIETY MINOR REQUIREMENTS

The minor consists of six courses. To assure an interdisciplinary learning experience, students must include at least one course from each of the following academic departments: history, philosophy, political science, and sociology. Law and Society 101, Contemporary Legal Issues, may be counted as either political science or sociology.

The law and society minor is applicable as a Warren College program of concentration in the social sciences.

### REQUIRED COURSES

1. Political Science 40—Introduction to Law and Society
2. Law and Society 101—Contemporary Legal Issues
3. One of the following four courses:  
History US 150—American Legal History to 1865  
History US 151—American Legal History Since 1865  
Political Science 104A—The Supreme Court and the Constitution  
Political Science 104B—Civil Liberties—Fundamental Rights
4. One of the following two courses:  
Philosophy 162—Philosophy of Law  
Sociology 140—Sociology of Law

**Two electives chosen from the following:****Communication/SF**

139A-B—Law, Communication, and Freedom of Expression

**Economics**

118A or B—Law and Economics

**History U.S.**

152—The Trials of America

153—American Political Trials

168—Topics in American Legal and Constitutional History

169—American Legal and Constitutional History

**Linguistics/Gen**

105—Law and Language

**Philosophy**

12—Logic and Decision Making

120—Political Philosophy

121—The State and Freedom

124—Contemporary Moral Issues

127—Professional Ethics

**Political Science**

102H—Political and Legal Foundations of the American Economy

104F—Constitutional Law Seminar

104I—Law and Politics—Courts and Political Controversy

105A—Comparative Legal Cultures

**Psychology**

162—Psychology and the Law

**Sociology**

141—Crime and Society

142—Social Deviance

144—Forms of Social Control

**Urban Studies and Planning**

124—Land Use Planning

171—Practical Urban Land Use Problems

If there are courses with substantial legal content, students may petition to substitute courses in the minor. Petitions should be submitted to the Interdisciplinary Programs Office, Literature Building, Second Floor, Warren Campus.

**RECOMMENDED INTERNSHIP EXPERIENCE**

Law-related internship (AIP 197): To be arranged at least one quarter in advance through the Academic Internship Program, Literature Building, Second Floor, Warren Campus. For each four

units of credit, ten hours a week for one quarter and a ten-page research paper are required.

**Courses**

As indicated above, most course work for the Law and Society minor is listed under the academic department providing instruction. Law and Society 101, described below, is an interdisciplinary course. It may be counted toward minor requirements as either political science or sociology. Students should consult the Interdisciplinary Programs Office for further information on Law and Society 101.

**UPPER DIVISION****101. Contemporary Legal Issues (4)**

This course will deal in depth each year with a different legal issue of contemporary significance, viewed from the perspectives of political science, history, sociology, and philosophy. Required for students completing the law and society minor. *Prerequisite: Political Science 40 or consent of instructor. May be repeated for credit once, for a maximum total of eight units.*

**LINGUISTICS**

OFFICE: 5237 McGill Hall, Muir College

**Professors**

Matthew Y. Chen, Ph.D.

Jeffrey L. Elman, Ph.D.

S.-Y. Kuroda, Ph.D.

Ronald W. Langacker, Ph.D., *Chair*

David M. Perlmutter, Ph.D.

Sanford A. Schane, Ph.D.

**Assistant Professors**

Farrell Ackerman, Ph.D.

Suzanne Kemmer, Ph.D.

Robert Kluender, Ph.D.

Barbara J. Levergood, Ph.D.

**Professors Emeritus**

Edward S. Klima, Ph.D.

Margaret Langdon, Ph.D.

Leonard Newmark, Ph.D.

Linguistics is the study of language. Like other rapidly developing fields, linguistics resists simple classification into one of the traditional categories of academic disciplines. As one of the humanities, linguistics is concerned with the historical development of a particular language or language family, or with the relation between language and literature. As a social science, linguistics may be related to anthropology, in describing language as part of culture; or it may be

related to psychology, in describing language as a kind of human behavior. One branch of linguistics, phonetics, may even be considered a natural science, related to the physical science of acoustics and the biological sciences of anatomy and physiology. As an applied science, linguistics has found many applications in fields as far apart as language pedagogy, speech therapy, and computer programming. Finally, linguistics may be considered a formal science in its own right, related to mathematics and formal logic.

A linguistics major offers excellent preparation for teaching in the elementary schools. If you are interested in earning a California teaching credential from UCSD, contact the Teacher Education Program for information about the prerequisite and professional preparation requirements. It is recommended that you contact TEP as early as possible in your academic career.

The Department of Linguistics at UCSD also offers elementary instruction in a variety of foreign languages.

**THE MAJOR PROGRAM****GENERAL REQUIREMENTS**

Every linguistics major must satisfy the undergraduate language requirement and must successfully complete a minimum of twelve upper-division courses, including five required courses and at least five upper-division linguistics electives. In addition to the general major, the department offers a set of enriched major programs in various specializations.

Except for Linguistics 198 or 199, no course taken on a Pass/Not Pass basis may be counted toward a linguistics major. No more than one quarter of Ling/Gen 198 or 199 may be counted toward a linguistics major. Transfer students should note that at least six of the ten required upper-division linguistics courses counted towards the major must be taken in residence at UCSD. A grade of C— or better is required for every course counted toward a linguistics major, including courses taken to satisfy the department's undergraduate language requirement.

**REQUIRED LINGUISTICS COURSES**

Before deciding to undertake a linguistics major, a student should take Linguistics 10. Required linguistics courses should then be taken as early as possible for maximum benefit to the student in other upper-division courses.

Every major program in linguistics must include the following required courses covering basic areas of the field:



## LINGUISTICS

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- Ling/Gen 110: Phonetics
- Ling/Gen 111: Phonology I
- Ling/Gen 120: Grammatical Structure
- Ling/Gen 121: Syntax I
- Ling/Gen 130: Semantics

### **CORE LINGUISTICS ELECTIVES**

Linguistics courses with course numbers between 110 and 159 are considered core area courses. The following courses are approved core electives for the linguistics major (Ling/Gen 141, 143, 147 and 151 may be repeated for credit, each repetition counting toward the major):

- Ling/Gen 115: Phonology II
- Ling/Gen 125: Syntax II
- Ling/Gen 141: Language Structures
- Ling/Gen 142: Language Typology
- Ling/Gen 143: Romance Linguistics
- Ling/Gen 145: American Indian Linguistics
- Ling/Gen 146: Structure of Japanese
- Ling/Gen 147: Classical Languages
- Ling/Gen 150: Historical Linguistics
- Ling/Gen 151: Language History
- Ling/Gen 154: History of English

### **OTHER LINGUISTICS ELECTIVES**

- Ling/Gen 103: Language and Consciousness
- Ling/Gen 105: Law and Language
- Ling/Gen 107: Sign Language and Its Culture
- Ling/Gen 160: Formal Linguistics
- Ling/Gen 163: Computational Linguistics
- Ling/Gen 170: Psycholinguistics
- Ling/Gen 172: Language and the Brain
- Ling/Gen 175: Sociolinguistics
- Ling/Gen 177: Theories and Methods of Foreign Language Acquisition
- Ling/Gen 178: Bilingualism and English as a Second Language
- Ling/Gen 182: Linguistics and Poetics
- Ling/Gen 184: Orthography

### **RESTRICTED COURSES**

- Ling/Gen 195: Apprentice Teaching (does not count as a linguistics elective)
- Ling/Gen 198: Directed Group Study in Linguistics
- Ling/Gen 199: Independent Study in Linguistics
- Ling/Gen 199H: Honors Independent Study in Linguistics

### **UNDERGRADUATE LANGUAGE REQUIREMENT**

Linguistics majors must demonstrate proficiency in one foreign language and must in addition successfully complete the equivalent of three quarters of foreign language instruction (based on standard four- or five-unit courses).

Proficiency in a foreign language may be demonstrated in either of two ways:

1. By passing the reading proficiency examination and the oral interview administered by the Department of Linguistics in French, German, or Spanish; or
2. By successfully completing a course given at UCSD representing the fourth quarter (or beyond) of instruction in any single foreign language with a grade of C- or better.

The three additional quarters of foreign language instruction may be in a single language or some combination of languages. The language in which proficiency was demonstrated is not excluded, provided that any additional courses in that language are beyond the fourth-quarter level and are more advanced than any course taken to demonstrate proficiency.

Students are encouraged to satisfy this requirement as early as possible in order to be able to use the languages for reference in linguistics courses. Students with native language competence in a language other than English may petition to have English count as satisfying the proficiency requirement.

### **GENERAL MAJOR**

The general major in linguistics requires satisfaction of the undergraduate language requirement and successful completion of twelve upper-division courses:

- 5 required linguistics courses
- 3 core linguistics electives
- 2 linguistics electives (core or other)
- 2 additional linguistics electives (core or other) or upper-division courses in other departments pertaining to the study of language

### **SPECIALIZED MAJORS**

**Every student with a specialized major must consult the appropriate faculty adviser in the Department of Linguistics to have approved an individual curricular plan to satisfy the major requirements for the option chosen.** Each specialized major requires satisfaction of the undergraduate language requirement and successful completion of a total of

fourteen courses as specified below. Of the courses counted towards the specialized major, at least twelve must be upper-division. To recognize the additional courses required for specialized majors, specialization will be reflected in the wording of a degree, e.g., "B.A. in Linguistics (with Specialization in Theoretical Linguistics)."

#### **Theoretical Linguistics**

- 5 required linguistics courses
- Ling/Gen 115: Phonology II
- Ling/Gen 125: Syntax II
- Ling/Gen 160: Formal Linguistics, or a core linguistics elective
- 2 core linguistics electives or relevant courses offered in philosophy or cognitive science, selected in consultation with the faculty adviser for theoretical linguistics
- 4 linguistics electives (core or other)

#### **Linguistics with Concentration in a Particular Language**

- 5 required linguistics courses
- 1 course selected from:
  - Ling/Gen 143: Romance Linguistics (for concentration in a Romance language)
  - Ling/Gen 150: Historical Linguistics
  - Ling/Gen 151: Language History (in language of concentration)
  - Ling/Gen 154: History of English
- 3 upper-division courses taught in the language of concentration
- 5 linguistics electives (core or other). Courses particularly relevant to this specialization are:
  - Ling/Gen 141: Language Structures (in language of concentration)
  - Ling/Gen 146: Structure of Japanese (for concentration in Japanese)
  - Ling/Gen 177: Theories and Methods of Foreign Language Acquisition
  - Ling/Gen 182: Linguistics and Poetics

#### **Language and Mind**

- 5 required linguistics courses
- 2 core linguistics electives
- 3 courses related to language and cognition from other departments, selected in consultation with the faculty adviser for language and mind
- 4 linguistics electives (core or other). Courses particularly relevant to this specialization are:



- Ling/Gen 103: Language and Consciousness  
 Ling/Gen 163: Computational Linguistics  
 Ling/Gen 170: Psycholinguistics  
 Ling/Gen 172: Language and the Brain

### **Language and Computers**

- 5 required linguistics courses  
 2 core linguistics electives  
 3 courses offered in the Departments of Computer Science and Engineering or Cognitive Science, selected in consultation with the faculty adviser for language and computers  
 4 linguistics electives (core or other). Courses particularly relevant to this specialization are:  
 Ling/Gen 125: Syntax II  
 Ling/Gen 160: Formal Linguistics  
 Ling/Gen 163: Computational Linguistics

### **Language and Society**

- 5 required linguistics courses  
 2 core linguistics electives  
 3 appropriate upper-division courses in other departments (especially the Departments of Anthropology, Communication, Cognitive Science, or Sociology), selected in consultation with the faculty adviser for language and society  
 1 course in sociolinguistics (by approval of the faculty adviser, may be taken in another department)  
 3 linguistics electives (core or other). Courses particularly relevant to this specialization are:  
 Ling/Gen 105: Law and Language  
 Ling/Gen 175: Sociolinguistics

### **English as a Foreign Language**

- 5 required linguistics courses  
 2 core linguistics electives  
 3 upper-division courses in the Teacher Education Program  
 4 linguistics courses (core or other). Courses particularly relevant for this specialization are:  
 Ling/Gen 154: History of English  
 Ling/Gen 175: Sociolinguistics  
 Ling/Gen 177: Theories and Methods of Foreign Language Acquisition  
 Ling/Gen 178: Bilingualism and English as a Second Language

*Revelle:* For Revelle College only, the classification of the linguistics major as humanities, natu-

ral science, or social science must be determined on the basis of each student's specific program. The classification of the major program will in turn determine what areas will be acceptable for the noncontiguous minor.

*Warren:* For Warren College only, any courses taken in departments other than linguistics may not overlap with the student's outside area(s) of concentration.

### **HONORS PROGRAM**

The department offers an honors program for outstanding students. Those students who have a 3.75 GPA in linguistics (3.25 overall) at the end of their junior year are eligible to participate. Students interested in participating in the honors program should consult with their department adviser: admission to the program requires nomination by the adviser and approval of the department faculty.

The honors program requires that two graduate linguistics courses be taken as part of the major, and further requires one quarter of 199H during which an honors paper is written. Responsibility for arranging the honors independent study with a professor rests with the student. Upon successful completion of the requirements the designation "with distinction," "with high distinction," or "with highest distinction" will appear on the student's diploma.

### **INDEPENDENT STUDY AND DIRECTED GROUP STUDY IN LINGUISTICS FOR MAJORS**

Upon presentation of a written study proposal or project, and with the consent of the instructor and the adviser, linguistics majors with at least a 3.5 GPA in the major courses may request permission to undertake directed group study in linguistics (Linguistics 198) or independent study in linguistics (Linguistics 199). No more than one such course (to be taken Pass/Not Pass) may count toward the major.

### **THE MINOR PROGRAM**

*Fifth, Muir, Third, and Warren:* For Fifth, Muir, Third, and Warren Colleges, the linguistics minor consists of six courses: Linguistics 10, 110, 111, 120, and 121, plus one additional upper-division course in linguistics.

*Revelle:* For Revelle College only, the linguistics minor consists of six courses including Linguistics 110, 120, and one additional upper-division course in linguistics. Two of the remaining minor courses must be upper-division courses relevant to the study of language but may be taken in departments other than linguistics: for

instance, the Departments of Mathematics, Computer Science and Engineering, Philosophy, Psychology, Anthropology, Sociology, Communication, Cognitive Science, or Literature. These courses must form a coherent program of study. The courses to complete the minor are selected in consultation with the departmental undergraduate adviser. The content of these courses will determine whether the linguistics minor is classified as humanities, natural science, or social science.

For all courses counted toward the linguistics minor, the student must receive letter grades of C- or better. Courses counted toward the minor may not be taken on a Pass/Not Pass basis, except Linguistics 198 or 199. Only one quarter of Ling/Gen 198 or 199 may be counted toward the minor.

### **THE PH.D. PROGRAM**

The Department of Linguistics offers a Ph.D. program that is unique in its primary emphasis on modern linguistic theory combined with serious study of a wide range of languages and language families from around the world, in particular African languages, American Indian languages, American Sign Language, Chinese, Germanic, Hungarian, Japanese, and Romance. This emphasis is complemented by unusually strong offerings and research interests in grammatical theory, comparative-historical linguistics, formal linguistics, computational linguistics, language processing, phonology, and second-language acquisition. The department has a wide array of research facilities. The phonetics laboratory contains a full complement of modern equipment for research in acoustic and articulatory phonetics as well as speech perception. The phonetics laboratory houses various computer systems, including a general-purpose network used by faculty, students, and staff; the department also has ready access to the campus computer network. In addition to the extensive linguistics holdings in the main library, the department maintains a reading room with a collection of research reports, dissertations, and unpublished papers. Access to the libraries of other UC campuses exists through interlibrary loan.

The department's language laboratory maintains a library of written and recorded materials permitting independent study of dozens of common and "exotic" languages; it includes a micro-computer facility for self-instruction in French, German, and Spanish. Since the Department of Linguistics directs foreign language instruction for the campus through its lower-division language courses, many opportunities are provided

for instruction and research in second language acquisition.

The department has its own excellent tape and videotape recording facilities for work in sociolinguistics, anthropological linguistics, psycholinguistics, and the sign language of the deaf. The Center for Research in Language facilitates research over a broad range of projects concerned with theoretical and applied problems. Finally, UCSD is ideally located from the standpoint of availability of native speakers of a wide variety of languages.

In the first two years of graduate study, the student's basic courses stress linguistic theory and linguistic analysis. For advanced work, students choose an area of specialization based on individual interests.

### PREPARATION

Since linguistics is a highly technical and analytic field, linguistics students will find their undergraduate training in mathematics and the natural sciences especially valuable. Undergraduate work in certain of the social sciences and humanities, particularly psychology, anthropology, philosophy and literature, is also good preparation for linguistics. Applicants are expected to have substantial experience with foreign languages. Students with no previous course work in linguistics proper are advised to become acquainted with the fundamentals of contemporary linguistic theory prior to enrollment. Students who, upon admission, are deficient either in their formal linguistic preparation or languages will be advised by the department on how to make up the deficiency. New graduate students will be admitted only in the fall of any academic year.

### LANGUAGE REQUIREMENTS

A candidate for the Ph.D. degree must demonstrate: (1) Conversational ability in *one* language other than English. (2) A reading knowledge of *two* languages, to be chosen from: French, German, Russian, and Spanish. A student whose native language is not English may use English as one of the languages to satisfy the reading knowledge requirement, the other being one of the four languages above which is not his or her first language.

### REQUIRED COURSES

Candidates for the Ph.D. must pass certain graduate courses prior to taking the qualifying examination. These include three to four courses in the general area of syntax/semantics; three to four courses in the general area of phonology/phonetics; and a two-quarter field methods sequence.

### EVALUATIONS

A graduate student is formally evaluated by the entire faculty at particular stages during the first three years of graduate study. The first evaluation (at the end of the third quarter of graduate study) pertains chiefly to performance in courses. The second (or comprehensive) evaluation (at the end of the fifth quarter) determines the student's fitness to continue in the Ph.D. program. It takes into account performance in course work and ability to engage in original research in one area of linguistics as demonstrated in a research paper. The third evaluation (at the end of the eighth quarter) focuses primarily on a second research paper (which must be in a different area of linguistics from the first).

### QUALIFYING EXAMINATION

Candidates for the Ph.D. degree must pass an oral qualifying examination which tests the student's knowledge in the area of specialization. Prior to taking this examination, the student must pass the comprehensive evaluation, satisfy all language requirements, successfully complete all required courses, and demonstrate—through research papers—the ability to carry out independent, dissertation-level research. Students must take the qualifying examination by the end of the fourth year of graduate work.

### DISSERTATION

The candidate for the Ph.D. will write a substantial dissertation incorporating the results of original and independent research carried out under the supervision of the doctoral committee. The candidate will be recommended for the doctor of philosophy degree after having made a successful oral defense of the dissertation before the doctoral committee in a public meeting and after having the final typed version of the dissertation accepted by the Central University Library.

### APPRENTICE TEACHING

As part of their preparation for a future academic career, graduate students in linguistics at UCSD are given special opportunities to participate in teaching programs under the supervision of a professor. Depending on qualifications, students may conduct conversation or analysis classes in lower-division language courses, or may assist a professor in the teaching of a graduate or undergraduate linguistics course.

### OTHER DEGREES

Candidates for the Ph.D. may be granted the M.A. in linguistics after: 1) satisfactorily completing twelve courses taken for a letter grade (eight of which must be graduate courses in the

Department of Linguistics at UCSD); 2) passing the comprehensive evaluation at the end of the fifth quarter; and 3) demonstrating reading proficiency in one language, to be chosen from among French, German, Russian, and Spanish. A student whose native language is not English may use English to satisfy this requirement.

Candidates for the Ph.D. may also be granted the C. Phil. upon completion of all degree requirements other than the dissertation.

### DEPARTMENTAL PH.D. TIME LIMIT POLICIES

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed seven years. Total registered time at UCSD cannot exceed eight years.

## Courses

### LANGUAGE

OFFICE: Linguistics Language Program Office, 2125 McGill Hall, Muir College

Students are placed in foreign language courses based on prior preparation and on the results of a placement test administered prior to or during orientation. Students who miss the placement exam should contact the Linguistics Language Program Office (McGill 2125) for instructions.

Conversation sections (Linguistics 1A-1B-1C-1D) consist of small tutorial meetings with a native speaker, plus reading and assigned laboratory work. Analysis sections (Linguistics 1Ax-1Bx-1Cx-1Dx) consist of group grammar discussion sections led by a linguist, assigned laboratory work, and outside reading. Each course in the 1A-1B-1C-1D series must be taken concurrently with the corresponding course in the 1Ax-1Bx-1Cx-1Dx series.

Linguistics 11 courses are self-instructional: intended for learning the language to read it for scholarly purposes. They are particularly aimed at graduate students preparing to fulfill French or German reading requirements.

Linguistics 19 courses, offered in more than fifty languages, are designed for self-instructional study at an introductory level. Depending on the availability of suitable materials, students may enroll for two, three, or four units of credit. For some languages, the course may be repeated for credit.

### ■ CHINESE

See: Chinese Studies

## ■ FRENCH

### Ling/Fr 1A. French Conversation (2.5)

Small tutorial meetings with a native speaker of French. Must be taken in conjunction with Ling/French 1Ax. *Prerequisite: no prior study of French required.*

### Ling/Fr 1Ax. Analysis of French (2.5)

An introduction to the academic study of French, including phonology and orthography, morphology, and syntax. The linguist conducting the class will assign and help interpret and test reading assignments in and about the language. Must be taken with Ling/French 1A. *Prerequisite: no prior study of French required.*

### Ling/Fr 1B. French Conversation (2.5)

Small tutorial meetings with a native speaker of French. Must be taken in conjunction with Ling/French 1Bx. *Prerequisites: two or more years of French in high school, or Ling/French 1A or equivalent.*

### Ling/Fr 1Bx. Analysis of French (2.5)

Review and refinement of phonological, morphological, and syntactic elements of French and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with Ling/French 1B. *Prerequisites: two years of high school study of the language, Ling/French 1Ax, or equivalent.*

### Ling/Fr 1C. French Conversation (2.5)

Small tutorial meetings with a native speaker of French. Must be taken in conjunction with Ling/French 1Cx. *Prerequisite: Ling/French 1B.*

### Ling/Fr 1Cx. Analysis of French (2.5)

Review and refinement of phonological, morphological, and syntactic elements of French and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with Ling/French 1C. *Prerequisite: Ling/French 1Bx.*

### Ling/Fr 1D. French Conversation (2.5)

Small tutorial meetings with a native speaker of French. Must be taken in conjunction with Ling/French 1Dx. *Prerequisite: Ling/French 1C.*

### Ling/Fr 1Dx. Analysis of French (2.5)

Review and refinement of phonological, morphological, and syntactic elements of French and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with Ling/French 1D. *Prerequisite: Ling/French 1Cx.*

### Ling/Fr 11. Elementary French Reading (2-4)

A self-instructional program designed to prepare graduate students to meet reading requirements in French. After a one-week introduction to French orthography/sound correspondence, students work with a self-instructional textbook. Mid-term and final examinations. (F,W,S)

See also: **Department of Literature**

### Lit/Fr 2A. Readings and Interpretations (4)

### Lit/Fr 2B. Readings and Interpretations (4)

### Lit/Fr 2C. French Composition (4)

### Lit/Fr 50. Readings/Interpretations (4)

## ■ GERMAN

### Ling/Ge 1A. German Conversation (2.5)

Small tutorial meetings with a native speaker of German. Must be taken in conjunction with Ling/German 1Ax. *Prerequisite: no prior study of German required.*

### Ling/Ge 1Ax. Analysis of German (2.5)

An introduction to the academic study of German, including phonology and orthography, morphology, and syntax. The linguist conducting the class will assign and help interpret and test reading assignments in and about the language. Must be taken with Ling/German 1A. *Prerequisite: no prior study of German required.*

### Ling/Ge 1B. German Conversation (2.5)

Small tutorial meetings with a native speaker of German. Must be taken in conjunction with Ling/German 1Bx. *Prerequisites: two or more years of German in high school or Ling/German 1A, or equivalent.*

### Ling/Ge 1Bx. Analysis of German (2.5)

Review and refinement of phonological, morphological, and syntactic elements of German and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with Ling/German 1B. *Prerequisites: two years of high school study of the language, Ling/German 1Ax, or equivalent.*

### Ling/Ge 1C. German Conversation (2.5)

Small tutorial meetings with a native speaker of German. Must be taken in conjunction with Ling/German 1Cx. *Prerequisite: Ling/German 1B.*

### Ling/Ge 1Cx. Analysis of German (2.5)

Review and refinement of phonological, morphological, and syntactic elements of German and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with Ling/German 1C. *Prerequisite: Ling/German 1Bx.*

### Ling/Ge 1D. German Conversation (2.5)

Small tutorial meetings with a native speaker of German. Must be taken in conjunction with Ling/German 1Dx. *Prerequisite: Ling/German 1C.*

### Ling/Ge 1Dx. Analysis of German (2.5)

Review and refinement of phonological, morphological, and syntactic elements of German and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with Ling/German 1D. *Prerequisite: Ling/German 1Cx.*

### Ling/Ge 11. Elementary German Reading (2-4)

A self-instructional program designed to prepare graduate students to meet reading requirements in German. After a one-week introduction to German orthography/sound correspondences, students work with a self-instructional textbook. Mid-term and final examinations. (F,W,S)

See also: **Department of Literature**

### Lit/Ge 2A. Readings and Interpretations (4)

### Lit/Ge 2B. Advanced Readings and Interpretations (4)

### Lit/Ge 2C. Composition and Conversation (4)

## ■ GREEK

See: **Department of Literature**

## ■ HEBREW

See: **Judaic Studies**

## ■ ITALIAN

### Ling/It 1A. Italian Conversation (2.5)

Must be taken in conjunction with Ling/Italian 1Ax. *Prerequisite: no prior study of Italian required.*

### Ling/It 1Ax. Analysis of Italian (2.5)

An introduction to the academic study of Italian, including phonology and orthography, morphology, and syntax. The linguist

conducting the class will assign and help interpret and test reading assignments in and about the language. Must be taken in conjunction with Ling/Italian 1A. *Prerequisite: no prior study of Italian required.*

### Ling/It 1B. Italian Conversation (2.5)

Must be taken in conjunction with Ling/Italian 1Bx. *Prerequisite: two or more years of Italian in high school or Ling/Italian 1A, or equivalent.*

### Ling/It 1Bx. Analysis of Italian (2.5)

Review and refinement of phonological, morphological, and syntactic elements of Italian and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken in conjunction with Ling/Italian 1B. *Prerequisite: two or more years of Italian in high school or Ling/Italian 1Ax, or equivalent.*

### Ling/It 1C. Italian Conversation (2.5)

Must be taken in conjunction with Ling/Italian 1Cx. *Prerequisite: Ling/Italian 1B.*

### Ling/It 1Cx. Analysis of Italian (2.5)

Review and refinement of phonological, morphological, and syntactic elements of Italian and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken in conjunction with Ling/Italian 1C. *Prerequisite: Ling/Italian 1Bx.*

### Ling/It 1D. Italian Conversation (2.5)

Must be taken in conjunction with Ling/Italian 1Dx. *Prerequisite: Ling/Italian 1C.*

### Ling/It 1Dx. Analysis of Italian (2.5)

Review and refinement of phonological, morphological, and syntactic elements of Italian and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken in conjunction with Ling/Italian 1D. *Prerequisite: Ling/Italian 1Cx.*

## ■ JAPANESE

See: **Japanese Studies**

## ■ LATIN

See: **Department of Literature**

## ■ PORTUGUESE

### Ling/Port 1A-1B-1C. Fundamentals of Portuguese (4-4-4)

Introduction to spoken and written Portuguese. Includes extensive development of comprehension and speaking skills as well as training in the reading and writing of Portuguese. *Prerequisite: none.*

## ■ RUSSIAN

See: **Department of Literature**

## ■ SPANISH

### Ling/Sp 1A. Spanish Conversation (2.5)

Small tutorial meetings with a native speaker of Spanish. Must be taken in conjunction with Ling/Spanish 1Ax. *Prerequisite: no prior study of Spanish required.*

### Ling/Sp 1Ax. Analysis of Spanish (2.5)

An introduction to the academic study of Spanish, including phonology and orthography, morphology, and syntax. The linguist conducting the class will assign and help interpret and test reading assignments in and about the language. Must be taken with Ling/Spanish 1A. *Prerequisite: no prior study of Spanish required.*



## LINGUISTICS

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### Ling/Sp 1B. Spanish Conversation (2.5)

Small tutorial meetings with a native speaker of Spanish. Must be taken in conjunction with Ling/Spanish 1Bx. *Prerequisites: two or more years of Spanish in high school, or Ling/Spanish 1A, or equivalent.*

### Ling/Sp 1Bx. Analysis of Spanish (2.5)

Review and refinement of phonological, morphological, and syntactic elements of Spanish and introduction of elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with Ling/Spanish 1B. *Prerequisites: two years of high school study of the language, Ling/Spanish 1Ax, or equivalent.*

### Ling/Sp 1C. Spanish Conversation (2.5)

Small tutorial meetings with a native speaker of Spanish. Must be taken in conjunction with Ling/Spanish 1Cx. *Prerequisite: Ling/Spanish 1B.*

### Ling/Sp 1Cx. Analysis of Spanish (2.5)

Review and refinement of phonological, morphological, and syntactic elements of Spanish and introduction of elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with Ling/Spanish 1C. *Prerequisite: Ling/Spanish 1Bx.*

### Ling/Sp 1D. Spanish Conversation (2.5)

Small tutorial meetings with a native speaker of Spanish. Must be taken in conjunction with Ling/Spanish 1Dx. *Prerequisite: Ling/Spanish 1C.*

### Ling/Sp 1Dx. Analysis of Spanish (2.5)

Review and refinement of phonological, morphological, and syntactic elements of Spanish and introduction of elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with Ling/Spanish 1D. *Prerequisite: Ling/Spanish 1Cx.*

### Ling/Sp 41. Intermediate Spanish for the Social Sciences (2)

This series of two-unit courses is to increase the student's language skills in order to interact professionally with native speakers of Spanish in the following areas: history, political science, sociology, economics, and general current political and economic affairs. Topics and materials include grammar review, television news broadcasts, newspaper readings, classroom discussion and essay writing. *Prerequisite: At least three semesters/four quarters of college Spanish or permission of instructor.*

### Ling/Sp 42. Intermediate Spanish for the Social Sciences (2)

This series of two-unit courses is to increase the student's language skills in order to interact professionally with native speakers of Spanish in the following areas: history, political science, sociology, economics, and general current political and economic affairs. Topics and materials include grammar review, television news broadcasts, newspaper readings, classroom discussion and essay writing. *Prerequisite: At least three semesters/four quarters of college Spanish or permission of instructor.*

### Ling/Sp 43. Intermediate Spanish for the Social Sciences (2)

This series of two-unit courses is to increase the student's language skills in order to interact professionally with native speakers of Spanish in the following areas: history, political science, sociology, economics, and general current political and economic affairs. Topics and materials include grammar review, television news broadcasts, newspaper readings, classroom discussion and essay writing. *Prerequisite: At least three semesters/four quarters of college Spanish or permission of instructor.*

See also: **Department of Literature**

### Lit/Sp 2A. Readings and Interpretations (4)

### Lit/Sp 2B. Composition and Conversation (4)

### Lit/Sp 2C. Cultural Readings (4)

### Lit/Sp 50A. Peninsular Literature (4)

### Lit/Sp 50B. Latin American Literature (4)

### Lit/Sp 50C. Latin American Topics (4)

## ■ DIRECTED STUDY

### Lang/19. Directed Study—Language (2-4)

Introductory-level study of a language in the language laboratory on a self-instructional basis. Depending on the availability of appropriate study materials, the course may be taken in blocks of two, three, or four units of credit and may be repeated up to the total number of units available for that language.

Afrikaans	Igbo
Albanian	Irish Gaelic
American Sign Language	Italian
Arabic (Eastern)	Japanese
Arabic (Egyptian)	Kannada
Arabic (Iraqi)	Korean
Arabic (Moroccan)	Malay
Arabic (Saudi)	Mongolian
Bengali	Navajo
Bulgarian	Norwegian
Burmese	Persian
Chinese (Cantonese)	Polish
Chinese (Mandarin)	Portuguese
Czech	Romanian
Danish	Russian
Dutch	Serbo-Croatian
Esperanto	Spanish
Finnish	Swahili
French	Swedish
German	Tagalog
Greek (Modern)	Thai
Haitian Creole	Tibetan
Hausa	Turkish
Hawaiian	Twi
Hebrew (Modern)	Vietnamese
Hindi-Urdu	Welsh
Hungarian	Yoruba

from smaller meaningful units. Designed to introduce students to whole families of words.

### 63. Language of the Computer (4)

Differences between human and computer languages. Overview of UNIX and the roles played by hardware and software. Editors, word-processing programs, utilities, C-shell scripts.

### 75. Language and Society (4)

Focus on language in its social context. Topics include but are not limited to: bilingualism, literacy, dialects, Black English, language planning, gender. Illustrated with case studies from a variety of social contexts and cultural settings.

### 76. The Language of Persuasion (4)

An examination of the ways in which language is employed in advertising and politics to control the beliefs and behavior of populations.

## UPPER DIVISION

### 103. Language and Consciousness (4)

Language and how it influences our perception of the universe; the Sapir-Whorf hypothesis. Psychological, physical, and linguistic aspects of space/time. The role of language in altered states of consciousness.

### 105. Law and Language (4)

The interpretation of language in understanding the law: the language of courtroom interaction (eyewitness testimony, jury instructions); language-based issues in the law (free speech and the First Amendment, libel and slander); written legal language (contracts, ambiguity, 'legalese', legal fictions). Readings include case studies, legal articles, and linguistic texts. *Prerequisite: upper-division standing.*

### 107. Sign Language and Its Culture (4)

Analysis of the phonological, morphological, and syntactic structure of American Sign Language. Comparison with oral languages. Poetry, narrative, and other literary forms in ASL. Through ASL basic questions concerning the nature of language and its relation to culture will be addressed.

### 110. Phonetics (4)

Basic anatomy and physiology of the mechanisms used in speech. Acoustic phonetics and speech perception. Transcription and production. Introduction to phonological feature systems.

### 111. Phonology I (4)

Examination of the phonological structure of natural languages. Exercises in phonological description. The empirical justification of phonological analyses.

### 115. Phonology II (4)

Current theoretical approaches to the sound structure of languages. *Prerequisite: Linguistics 111.*

### 120. Grammatical Structure (4)

Basic introduction to lexical, morphological, and syntactic structure. The course surveys representative lexical and grammatical phenomena drawn from a variety of typologically and genetically distinct languages of the world. Concepts and techniques for the analysis of lexical and grammatical structure are learned through problem solving exercises that apply them to actual language data.

### 121. Syntax I (4)

Introduction to the syntax of natural languages, with special reference to English. The empirical justification of syntactic analyses. Emphasis on problem solving and argumentation.

### 125. Syntax II (4)

Topics in the syntax of English and other languages. Syntactic theory and universals. *Prerequisite: Linguistics 121.*

## Courses

## LINGUISTICS

## LOWER DIVISION

### 5. Introduction to Language (4)

An interdisciplinary approach to language. Topics, which vary from year to year, will be drawn from: languages of the world and the origin of language; the role of language in thought, advertising, law, communication, literature, social interaction, and mystical experiences; spoken and visual languages; and the question of whether other species can learn human language. Intended primarily for non-majors.

### 10. Introduction to General Linguistics (4)

A general introduction to language and linguistics. Language as an instrument of communication. Aspects of the structure of English and other languages. Survey of linguistic sub-disciplines.

### 47. English Vocabulary Elements (4)

Introduction to the study of words in English from a structural and historical standpoint focussing on how words are built up



**130. Semantics (4)**

Introduction to the study of meaning. Survey of approaches to the analysis and description of semantic structure. Formal semantics and its application to natural language.

**141. Language Structures (4)**

Detailed investigation of the structure of one or more languages. Languages and language families likely to be examined include African Languages, American Sign Language, Chinese, Germanic, Hungarian, Japanese, Luiseño, Romance, Slavic, Uto-Aztecan, and others. Because the subject matter varies from quarter to quarter, this course may be repeated for credit.

**142. Language Typology (4)**

The systematic ways languages differ. Cross-linguistic studies of specified topics (e.g., word order, agreement, case, switch reference, phonological systems and rule types, etc.) in an effort to develop models of language variation.

**143. Romance Linguistics (4)**

Topics concerning the history or structure of the Romance languages. A survey of major syntactic, semantic, or phonological processes in one or more of these languages. Languages to be investigated include French, Spanish, Portuguese, and Italian. May be repeated for credit as topics vary.

**145. American Indian Linguistics (4)**

A survey of American Indian languages, their genetic relationships and areal groupings. Specific languages and families are selected for more detailed discussion, illustrating questions of relevance to linguistic theory and analysis, sociolinguistics, and applied linguistics.

**146. Structure of Japanese (4)**

Introduction to linguistic theory through the study of grammatical structures of Japanese. Emphasis is on the syntactic structure of Japanese and its comparison with English syntax. *Prerequisite: Japanese Studies 11 or consent of instructor.*

**147. Classical Languages (4)**

An investigation of the phonology, morphology, and syntax of Sanskrit, classical Greek, or Latin. Reading and translation of selected texts. May be repeated for credit when topics vary.

**150. Historical Linguistics (4)**

Introduction to the concepts and methodology of historical linguistics. Topics covered include the nature of language change, genetic and areal relationships, the comparative method, and internal reconstruction.

**151. Language History (4)**

Examination of the historical development of one language or a group of related languages. Languages and language families likely to be considered include Chinese, Indo-European, Japanese, Uto-Aztecan, and others. Because its subject matter varies, this course may be repeated for credit.

**154. History of English (4)**

General trends in the historical development of the English language, its sounds and its grammar.

**160. Formal Linguistics (4)**

Mathematical foundations of the formal syntax of natural languages. Introduction to the theory of formal languages, in particular context-free languages, and its relation to automata theory.

**163. Computational Linguistics (4)**

Topics variable, and may include: parsing theory; computational models of grammar; software tools for language analysis; UNIX operating system; SNOBOL4 and Lisp programming languages. May be repeated for credit when topics vary.

**170. Psycholinguistics (4)**

The study of models of language and of language acquisition from the point of view of modern linguistics and psychology. Basic experimental method as applied to language.

**172. Language and the Brain (4)**

Basic neuroanatomical and neuropsychological aspects of normal and abnormal language. Cerebral lateralization of language. Aphasia and dyslexia. Animal communication.

**175. Sociolinguistics (4)**

The study of language in its social context, with emphasis on the different types of linguistic variation and the principles underlying them. Dialects; registers; sex-based linguistic differences; factors influencing linguistic choice; formal models of variation; variation and change.

**177. Theories and Methods of Foreign Language Acquisition (4)**

This course examines linguistic, psychological, and pedagogical arguments that underlie various language teaching programs.

**178. Bilingualism and English as a Second Language (4)**

Sociolinguistic aspects of bilingualism especially as applied to the teaching of English to language minority groups in the United States. Methodology of teaching in an "English as a second language" or bilingual program. *Prerequisite: upper-division standing or consent of instructor.*

**182. Linguistics and Poetics (4)**

Formal poetics, a linguistic approach to various forms of literature. Fundamentals of linguistics are related to various current theories of literature. Special attention is given to structuralist analyses of literature including those by Jakobson and the generative grammarians.

**184. Orthography (4)**

The development and structure of writing systems. The relation between the orthography of a language and its phonology and morphology.

**195. Apprentice Teaching (0-4)**

Students lead a class section of a lower-division linguistics course. They also attend a weekly meeting on teaching methods. (This course does not count toward minor or major.) May be repeated for credit, up to a maximum of four units. *Prerequisites: consent of instructor, advanced standing.*

**198. Directed Group Study in Linguistics (2 or 4)**

Study of specific language structures or linguistic topics not covered in regular course work, under the direction of a faculty member in the Department of Linguistics. (P/NP grades only.) *Prerequisite: consent of instructor. May be repeated for credit.*

**199. Independent Study in Linguistics (2 or 4)**

The student undertakes a program of research or advanced reading in linguistics under the supervision of a faculty member of the Department of Linguistics. (P/NP grades only.) *Prerequisite: consent of instructor. May be repeated for credit.*

**199H. Honors Independent Study in Linguistics (4)**

The student undertakes a program of research and advanced reading in linguistics under the supervision of a faculty member in the Department of Linguistics. (P/NP grades only.) *Prerequisite: admission to Honors Program.*

## GRADUATE

NOTE: Unless otherwise specified, the following graduate courses may be taken on a Satisfactory/Unsatisfactory (S/U) basis.

**210. Phonetics (4)**

Anatomy and physiology of the mechanisms used in speech. Acoustic phonetics. Speech perception. Additional topics such as neurolinguistics, acquisition, distinctive feature theory, phonetic explanation in phonology. Practice in transcription and production of the international phonetic alphabet.

**211. Introductory Phonology (4)**

Introduction to theoretical concepts, methods of analysis, phonetic transcription, and descriptive apparatus.

**212. Theories of Phonology (4)**

Current theoretical approaches: one particular approach is explored in a given quarter. May be repeated for credit when topics vary.

**213. Issues in Phonology (4)**

Current theoretical issues. May be repeated for credit when topics vary.

**214. Topics in Phonetics (4)**

Advanced topics in phonetic sciences. Subjects will vary, and may include speech perception, acoustic phonetics, neurolinguistics. Laboratory techniques and computer tools in these areas will be covered. May be repeated for credit when topics vary.

**215. Topics in Phonology (4)**

Descriptive and theoretical problems in phonology. Discussion of work in progress and/or theoretical consequences of alternative analyses. May be repeated for credit when topics vary.

**221. Introductory Syntax (4)**

Introduction to theoretical concepts, methods of analysis, and descriptive apparatus, concentrating on syntactic constructions, major hypotheses, and argumentation techniques.

**222. Theories of Syntax (4)**

Current theoretical approaches: one particular approach is explored in a given quarter. May be repeated for credit when topics vary.

**223. Issues in Syntax (4)**

Current theoretical issues. May be repeated for credit when topics vary.

**225. Topics in Syntax (4)**

Descriptive and theoretical problems in syntactic analysis. Theoretical consequences of alternative analyses. May be repeated for credit when topics vary.

**227. Comparative Grammatical Structures (4)**

The purpose of this course is to combine the intensive study of a single language with a cross-linguistic perspective. The course focuses on selected phenomena in the grammar of one language, comparing them with analogous phenomena in other languages. Since the language chosen for intensive study will vary from year to year, the course may be repeated for credit.

**230. Semantics (4)**

Theories of semantic structure. The relation of meaning to grammar, and how it is to be accommodated in an overall model of linguistic organization. The application of formal semantics to the description of natural language.

**235. Topics in Semantics (4)**

Advanced material in special areas of the study of meaning and its relation to formal aspects of human language. As subject matter varies, the course may be repeated for credit.

**238. Lexicography (4)**

Principles and methods of lexicography. Topics may include: history of dictionary making, purposes of lexical collections, types of dictionaries, computer implementations.

**240A-B. Field Methods (4-4)**

The techniques of discovering the structure of a language through elicitation of data from native consultants under simulated field conditions. The first quarter typically focuses on phonetics/phonology, the second on syntax/semantics. May be taken for a letter grade only.

**241. Language Structures (4)**

Detailed investigation of the structure of one or more languages. Languages and language families likely to be examined include African languages, Chinese, Germanic, Hungarian, Jap-

## LITERATURE

anese, Romance, Uto-Aztecan, and others. Because the subject matter varies from quarter to quarter, this course may be repeated for credit.

### 242. Language Typology (4)

The systematic ways in which languages differ. Examination of existing classificatory models and criteria for their evaluation as well as for the construction of viable alternatives. Specific topics may include word order, agreement, case, switch reference, reflexives, voice, evidentials, phonological systems and rule types, accentual systems, etc. Since the topics vary from year to year, this course may be repeated for credit.

### 243. Romance Linguistics (4)

Topics concerning the history or structure of the Romance languages. Investigation of particular semantic, syntactic, morphological, or phonological processes in one or more of these languages. Languages to be investigated include French, Spanish, Portuguese, and Italian. May be repeated for credit as topics vary.

### 245. Topics in American Indian Linguistics (4)

Subjects covered may include: the genetic classification of American Indian languages; the structure of individual languages; change and reconstruction; areal relationships; survey of individual language families. Since the topic can change from year to year, course may be repeated for credit.

### 248. Morphology (4)

Theories of word structure are examined critically and confronted with data from a variety of languages. The problems studied vary from year to year. They may include issues such as the distinction between derivational and inflectional morphology, the interface between morphology and phonology, and the interface between morphology and syntax.

### 249. Topics in Sign Languages of the Deaf (4)

The structure of American Sign Language and other gestural languages of the deaf. Perception of language in the visual mode. Since the topic can change from year to year, course may be repeated for credit.

### 250. Historical Linguistics (4)

Introduction to the concepts and methodology of historical linguistics. Topics covered include the nature of language change, genetic and areal relationships, the comparative method, and internal reconstruction.

### 251. Language History (4)

Examination of the historical development of one language or a group of related languages. Languages and language families likely to be considered include Chinese, Indo-European, Japanese, Uto-Aztecan, and others. Because its subject matter varies, this course may be repeated for credit.

### 255. Topics in Historical Linguistics (4)

Advanced or specialized problems in the analysis of language change and inter-language relationships. Issues in the theory of language change and its implications for synchronic theory and description.

### 260. Formal Linguistics (4)

Theory of formal grammars, with particular emphasis on context-free grammars. Aspects of theories of automata and computation related to grammatical systems. Relationship of the hierarchies of automata and grammars.

### 263. Computational Linguistics (4)

Topics variable, and may include: parsing theory; computational models of grammar; software tools for language analysis; UNIX operating system; SNOBOL4 and Lisp programming languages. May be repeated for credit when topics vary.

### 265. Topics in Formal Linguistics (4)

Advanced material in special areas of the study of formal grammars to be selected by the instructor. May be repeated for credit. *Prerequisite: Linguistics 260 or consent of instructor.*

### 270. Psycholinguistics (4)

The study of models of language and of language acquisition from the point of view of modern linguistics and psychology.

### 272. Language and the Brain (4)

Basic neuroanatomical and neuropsychological aspects of normal and abnormal language. Cerebral lateralization of language. Aphasia and dyslexia. Animal communication.

### 277A-B. Research in Foreign Language Acquisition (4-4)

Investigation of methods of teaching foreign languages and the theories of language acquisition on which they are based.

### 288. Topics in the History of Linguistics (4)

Survey of salient features in the development of the various aspects of linguistic theory. Assessment of the contributions of principal schools, such as the neogrammarian, Prague, structuralist traditions. Since the topic can change from year to year, course may be repeated for credit.

### 290. Current Issues in Linguistic Theory (4)

Discussion of selected current issues: theoretical formulations, their predictions, and how relevant data can be brought to bear on them. Since the topics will change, this course may be repeated for credit.

### 292. Topics in Research in Progress (0-4)

Presentation and discussion of research in progress. May be repeated.

### 296. Directed Research (1-8)

Individual research. May be repeated for credit.

### 297. Fieldwork (1-8)

Linguistic analysis of language in the field. May be repeated for credit.

### 299. Doctoral Research (1-12)

Directed research on dissertation topic for students who have been admitted to candidacy for the Ph.D. degree. May be repeated for credit. *Prerequisite: admission to candidacy.*

### 500. Apprentice Teaching of Language (1-4)

The course, designed for graduate students serving as language assistants, includes discussion of teaching theories, techniques, and materials, conduct of discussion sessions, and participation in examinations, under the supervision of the instructor in charge of the course.

### 502. Apprentice Teaching of Linguistics (1-4)

The course, designed for graduate students serving as teaching assistants in the department's linguistics courses, includes discussion of teaching theories, techniques, and materials, conduct of discussion sessions, and participation in examinations, under the supervision of the instructor in charge of the course. The student must be serving as a teaching assistant in a Ling/Gen course to receive credit.

## LITERATURE

UNDERGRADUATE PROGRAM: 3110 Literature Building

GRADUATE PROGRAM: 3129/3130 Literature Building

ADMINISTRATIVE OFFICE: 3124 Literature Building

### Professors

Ronald S. Berman, Ph.D., *English Literature*  
Carlos Blanco-Aguinaga, Ph.D., *Spanish Literature*

Steven Cassedy, Ph.D., *Slavic and Comparative Literature*

Alain J.-J. Cohen, Ph.D., *Comparative Literature*

Jaime Concha, Ph.D., *Spanish and Latin American Literature*

Charles Cooper, Ph.D., *Writing; Coordinator, College Writing Programs*

Michael Davidson, Ph.D., *American Literature, Writing*

Abraham J. Dijkstra, Ph.D., *American and Comparative Literature*

Page duBois, Ph.D., *Classics and Comparative Literature*

Frances S. Foster, Ph.D., *American Literature*

Richard Friedman, Th.D., *Hebrew and Comparative Literature*

Marcel Henaff, Ph.D., *French Literature*

Fanny Howe, *Writing*

Susan Kirkpatrick, Ph.D., *Spanish and Comparative Literature*

James K. Lyon, Ph.D., *German Literature; Provost of Fifth College*

Masao Miyoshi, Ph.D., *English, Japanese and Comparative Literature; Hajime Mori Endowed Chair*

Louis Adrian Montrose, Ph.D., *English and American Literature, Chair*

Jerome Rothenberg, M.A., *English and American Literature, Writing*

Quincy Troupe, B.A., *Writing*  
Donald T. Wesling, Ph.D., *English and American Literature, Writing*

Sherley Anne Williams, M.A., *American and Afro-American Literature, Writing*

Wai-lim Yip, Ph.D., *Chinese and Comparative Literature*

### Associate Professors

Linda Brodkey, Ph.D., *Writing; Director, Warren College Writing Program*

Robert Cancel, Ph.D., *African and Comparative Literature*

Stephen Cox, Ph.D., *English Literature; Director, Revelle Humanities Writing Program*

David K. Crowne, Ph.D., *English and Comparative Literature*

Wai Dimock, Ph.D., *American Literature*

Thomas K. Dunseath, Ph.D., *English Literature*

Anthony Edwards, Ph.D., *Classics and Comparative Literature*

William Fitzgerald, Ph.D., *Classics and Comparative Literature*

Stephanie H. Jed, Ph.D., *Italian and Comparative Literature; Women's Studies*

George Mariscal, Ph.D., *Spanish Literature*

Fred V. Randel, Ph.D., *English Literature*  
 Marta E. Sanchez, Ph.D., *Latin American and Chicano Literature*  
 Rosaura A. Sanchez, Ph.D., *Spanish Literature*  
 Kathryn Shevelov, Ph.D., *English and American Literature*  
 Jon Snyder, Ph.D., *Italian and Comparative Literature*  
 William S. Tay, Ph.D., *Chinese and Comparative Literature*  
 Barbara Tomlinson, Ph.D., *Writing; Director, Muir College Writing Program*  
 Cynthia Walk, Ph.D., *German Literature*  
 Don Edward Wayne, Ph.D., *English Literature*

#### Assistant Professors

Rosemary George, Ph.D., *English Literature*  
 Judith Halberstam, Ph.D., *English and American Literature*  
 Nicole Hoffman, Ph.D., *English and American Literature*  
 Beth Holmgren, Ph.D., *Russian and Comparative Literature*  
 Todd Kontje, Ph.D., *German and Comparative Literature*  
 Lisa Lowe, Ph.D., *Comparative Literature*  
 William A. O'Brien, Ph.D., *German and Comparative Literature*  
 Max Parra, Ph.D., *Mexican and Latin American Literature*  
 Roddey Reid, Ph.D., *French Literature*  
 Pasquale Verdicchio, Ph.D., *Italian and Comparative Literature*  
 Winifred Woodhull, Ph.D., *French Literature*  
 Omelbanine Zhiri, Ph.D., *French Literature*

#### Professors Emeriti

Jack Behar, Ph.D.  
 Diego Catalan, Ph.D.  
 Edwin S. Fussell, Ph.D.  
 Reinhard Lettau, Ph.D.  
 Roy Harvey Pearce, Ph.D.  
 John L. Stewart, Ph.D.  
 Andrew Wright, Ph.D., F.R.S.L.

#### Lecturers

Charles Chamberlain, Ph.D., *Classical Languages and Literature, Writing*  
 Robert Dorn, M.A., *Writing*  
 Melvyn Freilicher, C.Phil., *Writing*  
 Elizabeth Jordan, Ph.D., *Revelle Humanities Program*  
 Christine Norris, Ph.D., *Revelle Humanities Program and Women's Studies*  
 Beatrice Pita, Ph.D., *Spanish Language and Latin American Literature*  
 Catherine Ploye, Ph.D., *French Language and Literature*  
 Stephen Potts, Ph.D., *American and Popular Literature*

Errol Seaton, Ph.D., *Revelle Humanities Program*  
 Rebecca Wells, M.A., *Russian Language and Literature*  
 Eliot Wirshbo, Ph.D., *Classical Languages and Literature*

#### Visiting Professors

Fredric Jameson, Ph.D.  
 Edward Saïd, Ph.D.

All literature courses at UCSD are offered by a single Department of Literature. The department brings together writers, teachers, scholars, and students of several different languages and literatures. Here, they are united by the nature of the studies they pursue. This lends a comparative aspect to both undergraduate and graduate programs, which lead to the bachelor of arts, master of arts, the candidate in philosophy, and doctor of philosophy degrees. All students must show knowledge of a foreign literature by doing upper-division or graduate work in that literature in the original language. Courses are offered not only in the literatures themselves but in the theoretical aspects of literature and—often in cooperation with other departments—in the relationship of literary study to other disciplines such as philosophy, visual arts, music, sociology, history, psychology, linguistics, and communication. With special permission, undergraduates may take graduate courses for credit, and graduate students may also take undergraduate courses for credit.

## THE UNDERGRADUATE PROGRAM

### LOWER-DIVISION PREPARATION

Lower-division requirements vary, depending on the literature program in which the student elects to concentrate. However, the department strongly recommends that, as part of the freshman/sophomore college requirements, students who have chosen or are considering a major in literature take the appropriate lower-division language sequence in the Departments of Linguistics or Literature as preparation for upper-division course work in a foreign language and literature.

### WRITING IN LITERATURE COURSES

It is the departmental expectation that in courses where English is the primary language, students in lower-division courses should write a minimum of 2,500 words per course. In upper-division courses the minimum requirement is 4,000 words per course.

## THE MAJOR IN LITERATURE

There are nine majors available to students within the Department of Literature: literatures in English, French, general literature, German, Italian, Russian, Spanish, writing, and the new major in two literatures. Requirements vary from program to program as described below. Once a student has decided upon a major in literature, he or she is required to meet with an adviser in the Department of Literature. Worksheets defining major requirements are available in the literature undergraduate office to help students organize their course work.

All students majoring in literature must study a secondary literature, that is, a literature written in a language different from that of their primary literature. The range of secondary literatures includes Classical Greek, Hebrew, and Latin, as well as the previously mentioned French, German, Italian, Russian, Spanish, and for those concentrating in a foreign literature, English. Students will satisfy this requirement by taking three courses in the secondary literature, given substantially in the native language. At least one of these courses must be upper-division, except in French, where two upper-division courses are required. Students should see an adviser to confirm the selection of the specific courses that will be taken to satisfy the upper-division component of the secondary literature requirement.

The lower-division component within the secondary literatures may be satisfied by: French 50; German, two courses numbered 50 or above; Hebrew 2 and 3 (see "Judaic Studies"); Italian 2B and 50; Greek 2 and 3; Latin 2 and 3; Russian 2B and 2C; two courses from Spanish 50A-50B-50C. For majors other than literatures in English, two courses from English 17-18-19, 21-22-23-24, and 50 are applicable. (General literature and writing courses *may not* be applied toward the English secondary literature requirement.)

Upper-division courses in the secondary literature are counted as part of the total number of upper-division courses required for the major. Students are free to choose from any of the regularly scheduled upper-division offerings in their secondary foreign literature. Special Studies courses (199s) cannot be used to satisfy the upper-division secondary literature requirement but will, where appropriate, be applied to the upper-division major elective requirements.

All regularly scheduled departmental courses taken to satisfy the requirements of the literature major, including courses in the secondary literature, must be taken for a letter grade. No grade below C- is acceptable for a course taken in the major.

Study abroad that is to count toward the major should be done before the senior year. Students who take Education Abroad Program courses in a country appropriate to their major may use a maximum of five upper-division courses to satisfy major requirements, and these must be petitioned through the department.

At least six of the upper-division courses for the major, including a minimum of four in the primary literature and one in the secondary literature, must be taken at UCSD (or a total of five through EAP and the balance at UCSD).

### HONORS PROGRAM

The department offers a special program of advanced study for outstanding undergraduates majoring in literature. Admission to this program ordinarily requires an overall GPA of 3.5 and a literature major GPA of 3.7 at the end of the junior year. Students meeting these requirements will be sent, the following fall, an invitation to participate in the program. In unusual cases, admission may also be granted to a senior who, though not meeting the GPA requirements, has submitted to the Literature Honors Committee by the end of the third week of fall quarter a petition for admission supported by three recommendations from members of the literature faculty. During the winter quarter of their senior year, all honors students together take an honors seminar (LTGN 191), which aims to deepen their understanding of the issues of theory and method implied in the study of literature. At this time, they lay the groundwork for an honors thesis, written in spring quarter (LT—196), each under the supervision of a faculty member who specializes in the literature of the student's primary concentration. The Honors Program concludes with an oral examination of each honors candidate by a faculty committee, which is charged with recommending whether departmental honors are warranted and, if so, which degree of honors—"with distinction," "with high distinction," or "with highest distinction"—will appear on the student's transcript and diploma. A student from this program will also be recommended for the Burckhardt Prize, which is awarded at graduation for outstanding achievement in the literature major. The honors seminar and thesis course may be applied toward the primary concentration in the literature major. For Literature/Writing majors, the honors seminar is considered to be equivalent to a writing workshop.

### SPECIAL STUDIES

Students with upper-division standing and a departmental GPA of at least 3.0 are eligible to take Special Studies courses (198s and 199s).

Those not satisfying this requirement may, with justification supported by the proposed Special Studies instructor, petition for an exception to the regulation. 198s and 199s require at least 4,000 words of writing or an equivalent project as determined by the instructor. Information and Special Studies Enrollment forms are available in the literature undergraduate office. Enrollment requires departmental approval. These courses *may not* be used to satisfy upper-division secondary literature requirements for majors.

### INDIVIDUAL PROGRAM REQUIREMENTS

#### PRIMARY CONCENTRATION IN LITERATURES IN ENGLISH

1. Four lower-division courses, two from each of the following two groups:

- a. LTEN 21, 22, 23 and TWS 21.
- b. LTEN 17, 18, 19 and LTEN 24.

Even if some or all of these courses are used toward meeting a college's humanities or general-education requirements, they will still count toward satisfying the requirements for the major in literatures in English.

2. Nine upper-division courses in literature in English, including courses from each of the following five categories:

- a. British literature before 1660: at least two courses
- b. British literature from 1660 to 1832: at least one course
- c. British literature from 1832 to the present: at least one course
- d. United States literature before 1860: at least one course
- e. United States literature after 1860: at least one course

3. Three courses in a secondary literature. See the heading, "The Major in Literature," above, for further information about this requirement.

4. Upper-division electives chosen from Department of Literature offerings to make a total of twelve upper-division courses.

#### PRIMARY CONCENTRATION IN A FOREIGN LITERATURE

##### French Literature

- 1. Nine upper-division courses as follows:
  - a. LTFR 115-116, Themes in French Intellectual and Literary History

- b. Seven additional upper-division courses in French literature, including at least one course in each of the following periods: seventeenth or eighteenth century; nineteenth century; and twentieth century.

- 2. Three courses in a secondary literature. See the heading, "The Major in Literature," above, for detailed information about this requirement.

- 3. Upper-division electives chosen from Department of Literature offerings to make a total of twelve upper-division courses.

##### German Literature

- 1. Nine upper-division courses in German literature.

- 2. Three courses in a secondary literature. At least one of these must be an upper-division course, except French, where two upper-division courses are required. See the heading, "The Major in Literature," above, for detailed information about this requirement.

- 3. Upper-division electives chosen from Department of Literature offerings to make a total of twelve upper-division courses.

##### Italian Literature

- 1. Nine upper-division courses in Italian literature as follows:

- a. LTIT 100, Introduction to Italian Literature
- b. LTIT 115, Medieval Studies
- c. LTIT 161, Advanced Stylistics and Conversation
- d. LTCS 140, Subaltern Studies in Context (approval pending)
- e. Five additional upper-division courses in Italian literature taught in Italian

- 2. Three courses in a secondary literature. See the heading, "The Major in Literature," above, for detailed information about this requirement.

- 3. Upper-division electives chosen from Department of Literature offerings to make a total of twelve upper-division courses.

##### Russian Literature

- 1. Russian 1A-B-C and 2A-B-C or their equivalent

- 2. Twelve upper-division courses in Russian:

- a. LTRU 101A-B-C
- b. LTRU 110A-B-C
- c. Six additional upper-division courses in Russian literature

- 3. Three courses in a secondary literature. See heading, "The Major in Literature," above, for further information about this requirement.



### **Spanish and Latin American Literature**

1. Two lower-division Spanish literature courses, as indicated:
  - a. LTSP 50A, Peninsular Literature
  - b. Either LTSP 50B or LTSP 50C, Latin American Literature
2. Nine upper-division courses as follows:
  - a. LTSP 130A, Development of Spanish Literature
  - b. LTSP 130B, Development of Latin American Literature
  - c. LTSP 119, Cervantes
  - d. Six additional upper-division courses in Spanish, Latin American and/or Chicano literature
3. Three courses in a secondary literature. At least one of these must be an upper-division course, except French, where two upper-division courses are required. See the heading, "The Major in Literature," above, for detailed information about this requirement.
4. Upper-division electives from Department of Literature offerings, whether in Spanish or in another literature, to make a total of twelve upper-division courses.

Students majoring in Spanish can choose to concentrate on either Spanish or Latin American literature. All students, however, are encouraged to take courses in the various national literatures as well as in Chicano literature for a broad background in Spanish language literatures.

Students not having a solid linguistic base in Spanish are advised to take intermediate language classes (LTSP 2A, 2B, 2C, 2D, 50A, 50B, and 50C) for additional review of Spanish grammar, further development of writing skills, and introduction to literary analysis. Only 50A and either 50B or 50C, however, can count towards the major.

### **PRIMARY CONCENTRATION IN GENERAL LITERATURE**

The purpose of the general literature major is to give students experience with the various modes of organizing literary study, without the exclusive concentration in a national literature characteristic of the previously described literature programs.

1. Group A: Four upper-division courses in a single national literature—that is, literature originally written in a single language, such as Russian, German, English, or a regional literature (current offerings: Africa, Latin America, and East Asia). These courses may treat the literature in the original language, or in translation, or in a combination of the two.

2. Group B: Four additional upper-division courses about a period, a genre, or a topic in literary study. Some examples: literature of the ancient world, the novel, poetry, and women's literature. The courses taken to satisfy the requirement in Group A cannot at the same time be applied to Group B (and vice versa).
3. Group C: Any four more upper-division courses in Third World literature (Africa, Asia, and Latin America). Students who have satisfied this requirement in Group A or Group B may take four upper-division courses from any of the departmental offerings.
4. Three courses in a secondary literature. See the heading, "The Major in Literature," above, for further information about this requirement. Upper-division courses taken to satisfy the secondary literature requirement may be counted as part of the twelve upper-division courses for the general literature major and may, where appropriate, be applied to Group A, Group B, or Group C.
5. One course in Lit/Writing may be applied to Group B, if the subject of the writing course is centrally related to the Group B topic. For example, if the topic chosen for Group B is poetry, a course in the writing of poetry could be one of the four courses offered to satisfy the requirement. No more than a total of two courses in writing may be taken as part of the general literature major.
6. At least two of the required twelve upper-division courses must be in literature written prior to 1700.

### **DUAL MAJOR IN LITERATURE**

The dual major in literature is designed to allow students to develop a solid foundation in two national literatures. This dual or composite major will require that students consult a faculty adviser in order to work out a dual concentration that meets the following criteria:

1. Students will select two literatures of concentration (Literature 1 and Literature 2)
  - a. one of the literatures must be in a language other than English;
  - b. both concentrations, however, can be in non-English literatures; thus a student can choose English and French, for example, or Russian and Spanish, French and Italian, German and Latin, Spanish and English, etc., but not General Literature.
2. Students will meet all lower-division major requirements for each of the two literatures of concentration. See specific "Primary Concentration" listings above; English, Spanish, and Russian, for example, all have lower-division requirements for the major.

3. Students will take eight upper-division courses in each of the two selected literatures of concentration for a total of sixteen upper-division courses:
  - a. these must satisfy the upper-division course requirements for *each* of the two majors. Thus, for example, if one of the concentrations is English, the student must include courses from each of the five stipulated categories; if one of the concentrations is Spanish, upper-division courses must include LTSP 119, 130A, and 130B.
  - b. beyond the upper-division requirements for each literature of concentration (Literature 1 and Literature 2), students will take a sufficient number of elective courses in *each* of the two literatures of concentration to make a total of eight upper-division courses in each chosen concentration.

### **PRIMARY CONCENTRATION IN WRITING**

The writing major is designed to provide directed experience in writing prose fiction and nonfiction, media workshops, and poetry, as well as intensive work in practical criticism. An indispensable feature of the program is that it involves students with the work of their peers. Those who think of themselves as writers will find courses regularly offered in the various genres to develop their own style and breadth of experience in composing and criticism. Those who are primarily interested in the teaching of writing will find the major a context both for writing extensively and for dealing critically with the act of written composition. *Note that effective fall 1991, students must complete the sequence LTWR 8A-8B-8C prior to declaring a major in writing.* The major requirements are as follows:

1. Any of the following literature sequences:
  - a. LTGN 4A-B-C-D-E-F—any three courses in the sequence (Fiction and Film in Twentieth-Century Societies)
  - b. LTGN 19A-B-C (Introduction to the Ancient Greeks and Romans)
  - c. LTEN 21, 22, and one course chosen from LTEN 17, 18, 19, 23, or 24.
  - d. TWS 21, 22, 23 (Third World Literatures)
2. A minimum of twelve upper-division courses:
  - a. Six upper-division courses in Lit/Writing from the writing workshop sequence. These workshops may be repeated for credit (see course listing for number of times workshops may be repeated), but the requirement should show a range of writing experience in at least two major writ-



ing types. No other courses may be substituted for this basic requirement of six upper-division workshops.

- b. One course from the group numbered Lit/Writing 140-144.
  - c. Five upper-division electives chosen from Department of Literature offerings; at least four of these courses must be other than Lit/Writing courses.
3. Three Department of Literature courses given in a language other than English. See the heading, "The Major in Literature," above, for further information about this foreign literature requirement.

**DOUBLE MAJOR IN WRITING AND A SUBJECT OUTSIDE LITERATURE**

Students who wish to major both in Literature/Writing and in a department other than the Department of Literature must fulfill all requirements for the writing major as described above. Students must submit a double major petition for approval by the participating departments and the student's provost office.

**DOUBLE MAJOR WITHIN THE DEPARTMENT OF LITERATURE IN WRITING AND ANOTHER LITERATURE**

Students who wish to major both in writing and in literature (any section) should see the department for information regarding appropriate double major requirements.

**THE MINOR IN LITERATURE**

The department offers a wide range of possibilities for noncontiguous minors. The options include courses in a single national literature, courses in more than one literature, and a combination of language and literature courses. In all instances, the minors require six courses. At least three of the courses must be upper-division. The three upper-division courses must be taken at UCSD (or through EAP). All courses taken to complete a literature minor must be taken for a letter grade. No grade below C- is acceptable.

Lower-division courses applicable toward minors:

- English—LTEN 17, 18, 19, 21, 22, 23, 24, 50
- French—LTFR 2A, 2B, 2C, 50
- German—LTGM 2A, 2B, 2C, 51, 52, 53, 54
- Greek—LTGK 1, 2, 3
- Hebrew—JUDA 1, 2, 3 (see Judaic Studies)

- Italian—LTIT 2A, 2B, 50
- Latin—LTLA 1, 2, 3
- Russian—LTRU 2A, 2B, 2C
- Spanish—LTSP 2A, 2B, 2C, 2D, 50A, 50B, 50C
- Writing—LTWR 8A, 8B, 8C

General Minor—Any six literature courses. There must be a minimum of three upper-division courses. No more than two courses in writing may be applied toward the general minor.

Writing Minor—The minimum of three upper-division courses must cover at least two major writing genres, with course work chosen from writing courses numbered 100 through 180.

**THE GRADUATE PROGRAM**

**DOCTORAL DEGREE PROGRAM**

The department now offers a single Ph.D. in literature. Students in the doctoral program may also qualify for the M.A. under Plan II (comprehensive examination plan). (See "Graduate Studies: The Master's Degree.") The C.Phil. is conferred upon all students advanced to candidacy for the Ph.D.

**PREPARATION**

The following are requirements for admission to graduate study in literature:

- 1. A baccalaureate or a master's degree with a major in one of the literatures offered by the department, or in another field approved by the departmental committee on graduate studies.
- 2. Satisfactory scores on the Graduate Record Examination.
- 3. A complementary working knowledge of a second language.

**COURSE OF STUDY**

Formal study begins with a first-year, three-quarter foundational sequence having a comparatist and theoretical emphasis. During the first three years, the course of study will include at least four seminars in one literature and two in another; at least four seminars drawn from offerings in literary theory, the second or a third literature, comparative literature, or composition studies; and five additional seminars open entirely to the student's choice. Such "open" seminars should generally be related to the intended dissertation field. Seminars in other disciplines may be substituted for any of the latter group, with the adviser's permission. For students with approved M.A. degrees the initial three-year sequence will be reduced to two.

The third year—during which in place of three seminars, students may opt for three courses in

independent study—is in part spent in completing preparation of the two papers (one 5,000 words in length, one 10,000 words in length) required as part of the qualifying examinations, which come during the first quarter of the fourth year. The balance of the fourth year and the whole of the fifth year will be devoted to preparation of the dissertation.

Students may write dissertations in any of the fields in which members of the department do research. These fields now include English, American, French, German, biblical Hebrew, Italian, Greek, Latin, Spanish, Chinese, Japanese, Polish, Russian, Chicano, Asian-American, and African-American literature, comparative literature, literary theory, women's studies, cultural studies, and composition studies.

**SPECIALTY IN COMPOSITION THEORY AND RESEARCH**

In keeping with the theoretical interdisciplinary tradition in the department, doctoral students may pursue special studies in composition theory and research. These studies do not constitute a separate degree program, but rather a sub-specialty within the Ph.D. program for students with a strong interest in theory and research. Within the department, students in composition theory have access to a diversified faculty in several national literatures with a variety of approaches to textual analysis, including structuralism and semiotics. Within the department, courses are available in the social and psychological aspects of literature, the pragmatics of the author/reader relationship, and the relations between oral and written discourse. And there are relevant courses in the Departments of Linguistics, Psychology, and Communication. In addition, upper-division undergraduate courses are available on the writing process, forms of written discourse, stylistics, and the teaching of writing. At the graduate level there are research and pedagogy courses and courses in the history of rhetoric. Students may teach in one of the five college freshman writing programs and learn firsthand what is involved in the administration and evaluation of college or university writing programs.

**LANGUAGE REQUIREMENTS**

Graduate students in literature are required to develop the ability to read literary and secondary texts and—when appropriate—to follow seminar discussions or lectures in a second language, a language other than the one in which the literature of their intended specialization is written. To satisfy this requirement students must demonstrate language proficiency and completion of



two seminars in the literature of the second language or, in exceptional cases, by completing with the grade of A two upper-division undergraduate courses given in the language. Beyond this requirement, students must pass a reading examination (equivalent to two years of study) in a second foreign language. The language requirements must be satisfied by the end of the third year of study.

Doctoral students specializing in comparative literature require knowledge in depth of two foreign languages. "Knowledge in depth" means the ability to attend graduate seminars given in the original language (or, in the case of classical and non-Western languages, seminars where the texts are read in the original language). Students must demonstrate this ability by enrolling in such seminars or, where this is not possible, by taking guided independent study in the language in question. Reading ability in French, German, Italian, or Spanish is strongly recommended where these languages are not included among the student's two principal foreign languages.

The M.A. program in comparative literature requires knowledge in depth of one foreign language.

### ADVANCEMENT TO CANDIDACY

No later than the first quarter of the third year, the student should choose a Ph.D. adviser, who will, in consultation with the student, form a qualifying examination committee. The student and the qualifying examination committee will jointly determine a list of readings to be covered by the written examination of the dissertation field. After the satisfactory completion of the two papers and the written examination, a two-hour oral doctoral examination takes place centering on the two papers and the written examination. On passing the oral examination, the student is declared eligible for advancement to candidacy for the Ph.D. The C. Phil. degree is conferred on those so advanced. Thereupon, a doctoral dissertation is written. This work is defended in a traditional final examination.

### TEACHING

The department requires that each Ph.D. student do some apprentice teaching before the completion of the degree; the minimum amount required is equivalent to the duties expected of a half-time teaching assistant for three academic quarters. This teaching involves conducting, with the guidance and support of a supervising professor, discussion sections and related activities in a variety of freshman and sophomore courses. Academic credit is granted for the training given under the apprentice teaching program.

### DEPARTMENTAL PH.D. TIME LIMIT POLICIES

Students must be advanced to candidacy by the end of four years. Departmental normative time is five years. Total registered time at UCSD cannot exceed eight years.

### MASTER'S DEGREE PROGRAM

The master's degree program is intended to meet the needs of two groups: (1) those who are admitted to the graduate program with the aim of proceeding to the master's degree only; and (2) full-time graduate students who are admitted to the Ph.D. program and who decide to qualify also for a master's degree. The M.A. degree is currently available in five fields: literatures in English, French, German, Spanish, and comparative literature. It is possible to take an M.A. in Spanish with a special emphasis on bilingual discourse or an M.A. in English with a special emphasis on composition theory. *Note: The department does not offer financial support for M.A. candidates.*

Completed applications and supporting materials must be received before January 1 for admissions to the following fall quarter. Those planning to apply should take the Graduate Record Examination far enough in advance so that the scores will be available to the admissions committee.

The requirements for the M.A. degree are a total of thirty-six units. Included must be the following:

1. Twenty units of graduate seminars. Students in comparative literature must take a four-unit seminar conducted in a language other than that of the student's principal concentration or, for ancient and oriental languages, an upper-division course where the texts are read in the original language.
2. Eight additional units of graduate seminars, upper-division courses, and/or guided independent study. Up to four units of supervised teaching at UCSD may be applied toward this eight-unit requirement.
3. Four units of literature in a language other than that of the student's principal concentration. This course may be taken either in the original language or in translation, and it may be used toward fulfilling the requirements listed under items 1 and 2 above. An upper-division or graduate course in English or American literature may be used to fulfill this requirement by students working toward an M.A. degree in French, German, or Spanish. An upper-division course in general literature may be taken to satisfy this requirement as long as its principal readings were originally written in a language other than that of their principal concentration.

4. Eight units of guided research, culminating in an acceptable master's thesis or master's examination.

### RESEARCH RESOURCES

The UCSD Library's Mandeville Department of Special Collections offers the undergraduate and graduate literature student an excellent range of resources, including single-author collections, rare and out-of-print books, tapes, maps, and historical archives. Of special interest are the Southworth Collection of Spanish Civil War materials, the Hill Collection of South Pacific Voyages, the Don Cameron Allen Renaissance collection, and the Archive for New Poetry. Within the latter collection are an extensive series of single-author archives, including the papers of Paul Blackburn, Donald Allen, Lew Welch, Charles Reznikoff, Joanne Kyger, Jerome Rothenberg, and others. The Archive for New Poetry is one of the largest collections of contemporary poetry in the United States. Students also have access, facilitated by travel grants, to all other University of California research collections.

## Courses

**NOTE: A LIST OF SPECIFIC COURSE OFFERINGS (WITH NAMES OF INSTRUCTORS FOR THE 1992-93 ACADEMIC YEAR) IS AVAILABLE IN THE UNDERGRADUATE OFFICE OF THE DEPARTMENT OF LITERATURE.**

**UNDERGRADUATE STUDENTS MAY ENROLL IN GRADUATE SEMINARS WITH THE CONSENT OF INSTRUCTOR AND WILL RECEIVE A P/NP GRADE UNLESS THEY PETITION FOR A LETTER GRADE OPTION WITHIN THE FIRST FOUR WEEKS OF THE QUARTER IN WHICH THE COURSE IS TAKEN.**

### ■ CHINESE LITERATURE

#### UPPER DIVISION

*Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.*

#### LTCH 101. Readings in Contemporary Chinese Literature (4)

Intended for students who have the competence to read contemporary Chinese texts, poetry, short stories, and criticism in vernacular Chinese. May be repeated for credit as topics vary.

#### LTCH 120. Readings in Classical Chinese Poetry (4)

This course is designed to introduce the art of Chinese poetry through close readings of the texts. Selections range from Shih ching to Sung tz'u, with particular emphasis on the high T'ang period. Students are required to read the texts in the original. *Prerequisite: two years of Chinese or equivalent.*

#### LTCH 140A. Classical Chinese Literature in Translation (4)

The course will focus on a few representative masterpieces of Chinese literature in its classical age, with emphasis on the formal conventions and the social or intellectual presupposi-

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tions that are indispensable to their understanding. May be repeated for credit as topics vary.

### **LTCH 140B. Modern Chinese Literature in Translation (4)**

A survey of representative works of the modern period from 1919 to 1949. May be repeated for credit as topics vary.

### **LTCH 140C. Contemporary Chinese Literature in Translation (4)**

An introductory survey of representative texts produced after 1949, with particular emphasis on the social, cultural, and political changes. May be repeated for credit as topics vary.

### **LTCH 198. Directed Group Study (4)**

Directed group study in areas of Chinese literature not normally covered in courses. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

### **LTCH 199. Special Studies (2 or 4)**

Tutorial; individual guided reading in areas not normally covered in courses. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

## ■ COMPARATIVE LITERATURE

## GRADUATE

### **LTCO 202A-B-C. History of European Criticism and Aesthetics (4-4-4)**

A core course for comparative literature, strongly recommended for all graduate students in the comparative literature program. A historical survey of criticism and aesthetics divided as follows: 202A, Classical Antiquity; 202B, Renaissance to Enlightenment; 202C, Romanticism to late nineteenth century.

### **LTCO 210. Classical Studies (4)**

Analysis of significant works of the Greek and Roman traditions, with attention to their interest for later European literature. May be repeated for credit as topics vary.

### **LTCO 215. Medieval Studies (4)**

A study of styles and forms of narrative poetry in medieval English, French, German, and Latin. May be repeated for credit as topics vary.

### **LTCO 221. Renaissance Studies (4)**

One or more major writers, texts, or trends of European Renaissance. May be repeated for credit as topics vary.

### **LTCO 224. Seventeenth-Century Studies (4)**

One or more major writers, texts, or trends of seventeenth-century European literature. May be repeated for credit as topics vary.

### **LTCO 241. Romanticism (4)**

A study of the romantic movement in various national literatures. May be repeated for credit as topics vary.

### **LTCO 242. Nineteenth-Century Studies (4)**

Consideration of one or more major figures, texts, trends, or problems in the nineteenth century. May be repeated for credit as topics vary.

### **LTCO 243. Symbolism (4)**

A study of the poetic imagery and of the changes in symbolic and thematic significance from the eighteenth to the twentieth century. May be repeated for credit as topics vary.

### **LTCO 252. Modernism (4)**

A sample investigation into the concept of period. The course will deal also with the question of the existence of modernism, the description of the phenomenon, and the causes to which it is to be attributed. May be repeated for credit as topics vary.

### **LTCO 255. Context, Text, and Self-Expression in Soviet Literature (4)**

This seminar will examine the figuring of the text and the self of the creator within context shaped by Stalinism (extending from late 1920s to late 1980s). Sources include fictional and autobiographical-essayistic works by Osio and Nadezhda Mandelstam, Boris Pasternak, Mikhail Bulgakov, Lidia Chukovskaia and Andrei Siniavskii/Abram Terts. (Open to qualified seniors and juniors with consent of instructor.)

### **LTCO 264. Oral Literature (4)**

An introduction, through the study of recordings of actual oral performance as well as of the written record, to research in oral literature and the theoretical and methodological problems entailed.

### **LTCO 274. Genre Studies (4)**

A consideration of a representative selection of works relating to a theme, form, or literary genre. May be repeated for credit as topics vary.

### **LTCO 281. Literature and Film (4)**

A study of literature and film in relation to one another, to critical and aesthetic theories, and to historical contexts.

### **LTCO 295. M.A. Thesis (1-8)**

Research for the master's thesis. Opened for repeated registration up to eight units. (Satisfactory/Unsatisfactory grades only.) *Prerequisite: enrolled in M.A. program.*

### **LTCO 296. Research Practicum (1-12)**

Research project to be developed by a small group of students under the continued direction of individual faculty members. Primarily a continuation of a previous graduate seminar. The 296 courses do not count toward the seminar requirement. Repeatable for credit.

### **LTCO 297. Directed Studies: Reading Course (1-12)**

This course may be designed according to an individual student's needs when seminar offerings do not cover subjects, genres, or authors of interest. No paper required. The 297 courses do not count toward the seminar requirement. Repeatable for credit.

### **LTCO 298. Special Projects: Writing Course (1-12)**

Similar to a 297, but a paper is required. Papers are usually on subjects not covered by seminar offerings. Up to two 298s may be applied toward the twelve-seminar requirement of the doctoral program. Repeatable for credit.

### **LTCO 299. Dissertation (1-12)**

Research for the dissertation. Offered for repeated registration. Open only to Ph.D. students who have advanced to candidacy.

## ■ LITERATURE/CULTURAL STUDIES

Courses are listed under the heading CRITICAL THEORY/CULTURAL STUDIES, below.

## ■ LITERATURES IN ENGLISH

## LOWER DIVISION

### **LTEN 17. Introduction to Afro-American Literature (4)**

A lecture discussion course that examines a major topic or theme in Afro-American literature as it is developed over time and across the literary genres of fiction, poetry, and belle lettres. A particular emphasis of the course is how Afro-American writers have adhered to or departed from conventional definitions of genre.

### **LTEN 18. Introduction to Asian-American Literature (4)**

This course provides an introduction to the study of the history, communities, and cultures of different Asian-American people in the United States. Students will examine different articula-

tions, genres, conflicts, narrative forms, and characterizations of the varied Asian experience.

### **LTEN 19. Introduction to Chicano Literature (4)**

This course provides an introduction to the literary production of the population of Mexican origin in the United States. Students will examine a variety of texts dealing with the historical (social, economic, and political) experiences of this heterogeneous population.

### **LTEN 21. Introduction to the Literature of the British Isles: Pre-1660 (4)**

An introduction to the literatures written in English in Britain before 1660, with a focus on the interaction of text and history.

### **LTEN 22. Introduction to the Literature of the British Isles: 1660-1832 (4)**

An introduction to the literatures written in English in Britain and Ireland between 1660 and 1832, with a focus on the interaction of text and history.

### **LTEN 23. Introduction to the Literature of the British Isles: 1832-Present (4)**

An introduction to the literatures written in English in Britain, Ireland, and the British Empire (and the former British Empire) from 1832 to the present, with a focus on the interaction of text and history.

### **LTEN 24. Introduction to the Literature of the United States (4)**

An introduction to the literatures written in English in the United States, with a focus on the interaction of text and history.

### **LTEN 50. Introduction to Shakespeare: The Theatre and the World (4)**

An introduction to Shakespeare's dramatic achievement through the study of several major plays—representative comedies, histories, and tragedies—in their literary, intellectual, and social contexts.

### **LTEN 90. Undergraduate Seminars (1)**

Readings and discussions focused on a writer, period, or literary topic. The aim of the course is to acquaint the lower-division student with literatures in English as fields of university study. Does not fulfill major or minor requirements in literature. Repeatable for credit when topics vary.

## UPPER DIVISION

*Prerequisite: upper-division standing or consent of instructor.* Additional prerequisites may be specified below.

### **LTEN 106. The Medieval Period (4)**

Studies in medieval English literature. Topics such as medieval allegory in English, Chaucer's contemporaries, Middle English lyrics, and Middle English romances as well as surveys of Middle English literature will be presented.

### **LTEN 107. Chaucer (4)**

A study of Chaucer's poetic development, beginning with *The Book of the Duchess* and *The Parliament of Fowls*, including *Troilus and Criseyde*, and concluding with substantial selections from *The Canterbury Tales*.

### **LTEN 108. The Waning of the Middle Ages (4)**

Studies in English literature of the late Middle Ages and early Renaissance. Various topics, including the craft-cycle plays; moralities and interludes; the Scottish Chaucerians; fifteenth-century poetry; Malory; and romances, visions, and satires of the late Middle Ages.

### **LTEN 110. The Renaissance: Themes and Issues (4)**

Major literary works of the Renaissance, an exciting period of social and cultural transformation in England as elsewhere in Europe. Topics may include a central theme (e.g., humanism,

reformation, revolution), a genre (e.g., pastoral), or comparison with other arts and sciences.

**LTEN 112. Shakespeare I: The Elizabethan Period (4)**

A lecture/discussion course exploring the development of Shakespeare's dramatic powers in comedy, history, and tragedy, from the early plays to the middle of his career. Dramatic forms, themes, characters, and styles will be studied in the contexts of Shakespeare's theatre and his society.

**LTEN 113. Shakespeare II: The Jacobean Period (4)**

A lecture/discussion course exploring the rich and varied achievements of Shakespeare's later plays, including the major tragedies and late romances. Dramatic forms, themes, characters, and styles will be studied in the contexts of Shakespeare's theatre and his society.

**LTEN 114. Shakespeare III: Stage, Film, and Television (4)**

A lecture/discussion/laboratory course involving the close study of six to eight plays representative of Shakespeare's artistic career with particular emphasis upon the interrelation of Elizabethan plays and the stage and the critical implications of transposing plays to film and television.

**LTEN 115A. The Sixteenth Century: Themes and Issues (4)**

Selected topics concerned with sixteenth-century English literature as a whole.

**LTEN 115D. The Golden Age of Elizabethan Literature (4)**

An introduction to the literary achievement of Elizabethan England during the last two decades of the sixteenth century. Works by major writers in a variety of literary forms (e.g., sonnet, mythological poem, romantic epic, pastoral, satire, prose fiction, heroic and tragic drama) are studied in relation to relevant social contexts.

**LTEN 115E. Elizabethan Verse: Poems, Poetics, and Society (4)**

An introduction to the reading of Renaissance poems. Elizabethan poetry in a variety of forms will be studied in the context of Elizabethan poetics, cultural values, and social relations.

**LTEN 116. Elizabethan and Jacobean Drama (4)**

The study of representative plays from one of the great moments in the history of dramatic literature. Tragedies and comedies, primarily by Shakespeare's contemporaries and successors, are read in the context of the historical, social, and intellectual background of the period.

**LTEN 117A. The Seventeenth Century: Themes and Issues (4)**

Selected topics in English literature during a period when writers felt deeply the impact of social change, religious controversy, the emergence of the "New Science," and the English Civil War. Readings chosen from among the works of a diverse group of writers, including Jonson, Donne, Bacon, Milton, Marvell, and Dryden.

**LTEN 117B. Seventeenth-Century Verse (4)**

A study of the varieties of poetry and poetic style from the end of the reign of Elizabeth I up to the Restoration. The course may consider major poets such as Donne, Jonson, Herbert, or Marvell individually and comparatively. Or it may examine a particular mode (e.g., metaphysical or cavalier poetry) through which poets who share stylistic and thematic concerns are studied.

**LTEN 117C. Seventeenth-Century Prose (4)**

Studies in the creation and development of a tradition of English prose style. Topics may include the relationship between the writing of prose and the exploration of human personality, the effects of religious controversy on prose style, or the emergence of a "plain style" under the influence of the New Science.

**LTEN 118. Milton (4)**

A critical examination of the major works, including *Paradise Lost*, by an author who was both a central figure in English political life in a revolutionary age and, in the view of most critics, the greatest non-dramatic poet in the English language. The course will study his poetic development in a variety of historical contexts.

**LTEN 119. Restoration Literature (4)**

The literature of a period following twenty years of civil war and revolution which saw the reopening of theatres and the rise of the professional writer. Topics may include Restoration comedy and tragedy; satire; neoclassical literary theory.

**LTEN 120A. The Eighteenth Century: Themes and Issues (4)**

Selected topics in English literature during an age of satiric writing, the shift from neoclassicism to romanticism, the emergence of the novel, and the expansion of the reading and writing public among the middle class and women. Writers such as Defoe, Pope, Swift, Richardson, Johnson, Burney, Wollstonecraft. May be repeated for credit when topics vary.

**LTEN 120B. The Age of Pope (4)**

Pope, Swift, Addison, Steele, Gay, and their contemporaries.

**LTEN 120C. Samuel Johnson and His Time (4)**

Johnson, Boswell, Burke, Goldsmith, and their contemporaries.

**LTEN 120D. William Blake and the Age of Sensibility (4)**

A study of the great visionary poet and artist, William Blake, in the context of several of his eighteenth-century contemporaries, such as Gray, Collins, Chatterton, and Cowper.

**LTEN 120E. Women in the Eighteenth Century (4)**

Selected topics concerning British women writers and readers in an age of increasing female participation in print culture. Topics include women writers; representations of women, domesticity, and the family in the novel, in drama, in satire; early feminist writing; literary constructions of gender. May be repeated for credit when topics vary.

**LTEN 125A. Romanticism: Themes and Issues (4)**

Selected topics concerned with the romantic period as a whole.

**LTEN 125B. First Generation Romantic Poets (4)**

The poets who came of age during the French Revolution and who inaugurated literary modes that continue in our own time: Wordsworth, Coleridge, Blake, and their contemporaries.

**LTEN 125C. Second Generation Romantic Poets (4)**

Byron, Keats, Shelley, and their contemporaries.

**LTEN 125E. The Romantics and the Visual Arts (4)**

An examination of the links between the work of one or more of the romantic writers and specific aspects of iconography and representation in the visual arts.

**LTEN 125F. Byron and Byronism (4)**

Lord Byron's life, works, and cultural impact, including an examination of some later authors, such as Carlyle and the Brontës, who responded to Byron through their own writings.

**LTEN 125G. Keats and His Poetical Heirs (4)**

The major poetry of John Keats considered together with selected works influenced by him, including poems by such authors as Tennyson, Christina Rossetti, Hopkins, Hardy, Yeats, and Stevens.

**LTEN 127A. The Victorian Period: Themes and Issues (4)**

Selected topics concerned with Victorian literature as a whole.

**LTEN 127B. Victorian Poetry (4)**

Tennyson, Browning, Arnold, Clough, Hopkins, and their contemporaries.

**LTEN 127G. The Nineties: Decade of Decadence (4)**

Selected topics concerning literature and culture from the 1890s. Themes and metaphors of the *fin de siècle* might include imperial decline, sexual anarchy, crises of transition, the emergence of modern sexual identity, censorship issues, boundary violations.

**LTEN 130A. Modern British Literature: Themes and Issues (4)**

Selected topics concerned with modern British literature as a whole.

**LTEN 130B. Modern British Poetry (4)**

Such poets as Thomas Hardy, D.H. Lawrence, Hugh MacDiarmid, W.H. Auden, Dylan Thomas, Philip Larkin, Ted Hughes, and Geoffrey Hill.

**LTEN 132. Modern Irish Literature (4)**

The Irish Revival and its aftermath: Yeats, Synge, O'Casey, Joyce, Beckett, and their contemporaries.

**LTEN 133. Modern Scottish Literature (4)**

This course takes Scottish writing from the Kailyard School of the late nineteenth century through the 1920s' revival of Scottish nationalism, to the 1980s' emergence of Glasgow as a literary center.

**LTEN 143. The English Novel in the Eighteenth Century (4)**

This course studies the writing of the novel in English during the eighteenth century. The focus of the course may be an introduction to selected major writers and texts, or a particular issue or problem in the literary and social history of the novel. May be repeated for credit when topics vary.

**LTEN 144. The English Novel in the Nineteenth Century (4)**

This course studies the writing of the novel in English during the nineteenth century. The focus of the course may be an introduction to selected major writers and texts, or a particular issue or problem in the literary and social history of the novel. May be repeated for credit when topics vary.

**LTEN 145. The English Novel in the Twentieth Century (4)**

This course studies the writing of the novel in English during the twentieth century. The focus of the course may be an introduction to selected major writers and texts, or a particular issue or problem in the literary and social history of the novel. May be repeated for credit when topics vary.

**LTEN 146. Women and English/American Literature (4)**

Selected topics concerning women and anglophone literature. Topics include women writers, the literary representation of women, and women as readers. May be repeated for credit when topics vary.

**LTEN 147. Metamorphoses of the Symbol (4)**

An investigation of a single symbol—such as the cave or the mountain—as it functions within the literature and other expressions of widely different historical moments, with an emphasis upon English and American literature. May be repeated for credit as topics vary.

**LTEN 148. Genres in English and American Literature (4)**

An examination of one or more genres in English and/or American literature, for example, satire, utopian fiction, autobiography, landscape poetry, the familiar essay. May be repeated for credit as topics vary.

**LTEN 149. Themes in English and American Literature (4)**

A consideration of one of the themes that recur in many periods of English or American literature, for instance, love, politics, the role of women in society. May be repeated for credit as topics vary.



## LITERATURE

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### **LTEN 150. Gender, Text, and Culture (4)**

This course studies representations of the sexes and of their interrelationship in various forms of writing produced during different phases of English history. Emphasis will be placed upon connections of gender and of literature to other modes of social belief, experience, and practice. Repeatable for credit when topics vary.

### **LTEN 152. The Origins of American Literature (4)**

Studies in American writing from the Puritans to the early national period (1620-1830), with emphasis on the thrust and continuity of American culture, social and intellectual, through the beginnings of major American writing in the first quarter of the nineteenth century.

### **LTEN 154. The American Renaissance (4)**

A study of some of the chief works, and the linguistic, philosophical, and historical attitudes informing them, produced by such authors as Emerson, Hawthorne, Melville, Dickinson, and Whitman during the period 1836-1865, when the role of American writing in the national culture becomes an overriding concern.

### **LTEN 155. Interactions Between American Literature and the Visual Arts (4)**

An exploration of the parallels between the work of individual writers, or movements, in American literature and the style and content of the work of certain visual artists. The writers studied are always American; the artists or art movements may represent non-American influences on these American writers. May be repeated for credit as topics vary.

### **LTEN 156. American Literature from the Civil War to World War I (4)**

A critical examination of works by such authors as Mark Twain, Henry James, Kate Chopin and Edith Wharton, who were writing in an age when the frontier was conquered and American society began to experience massive industrialization and urbanization.

### **LTEN 158. Modern American Literature (4)**

A critical examination of American literature in between World War I and World War II—the age of the great American modernists, among them Pound, H.D., and Eliot; Hemingway, Stein, and Faulkner; Stevens, Moore, and Williams.

### **LTEN 171. American Poetry I—through Early Whitman (4)**

Reading and interpretation of American poets from the Puritans through the emergence of Whitman. Lectures will set the appropriate context in sociocultural and literary history.

### **LTEN 172. American Poetry II—Whitman through the Modernists (4)**

Reading and interpretation of American poets from Whitman through the principal modernists—Pound, H.D., Eliot, Moore, Stevens, and others. Lectures will set the appropriate context in sociocultural and literary history.

### **LTEN 173. American Fiction I—through Early James (4)**

Reading and interpretation of American fiction from its early nineteenth-century origins through the emergence of Henry James. Lectures will set the appropriate context in sociocultural and literary history.

### **LTEN 174. American Fiction II—Since Middle James (4)**

Reading and interpretation of American fiction from Henry James through the principal modernists—Fitzgerald, Stein, Welty, Faulkner, and others. Lectures will set the appropriate context.

### **LTEN 175A. New American Fiction—Post-World War II to the Present (4)**

Reading and interpretation of American fiction from the mid-1940s to the present. Lectures will set the appropriate

context in sociocultural and literary history. May be repeated for credit when topics vary.

### **LTEN 175B. New American Poetry—Post-World War II to the Present (4)**

Reading and interpretation of American poets whose work has made its major impact since the last war, for instance Charles Olson, Robert Creeley, Denise Levertov, Adrienne Rich, Allen Ginsberg, Frank O'Hara, and John Ashbery. Lectures will set the appropriate context in sociocultural and literary history. May be repeated for credit as topics vary.

### **LTEN 176. Major American Writers (4)**

A study in depth of the works of major American writers. May be repeated for credit as topics vary.

### **LTEN 177. California Literature (4)**

Reading and interpretation of such novelists as London, Norris, Steinbeck, West, and Didion and such poets as Jeffers, Rex-roth, Everson, Duncan, and Snyder. May be repeated for credit as topics vary.

### **LTEN 178. Comparative Ethnic Literature (4)**

A lecture-discussion course that juxtaposes the experience of two or more U.S. ethnic groups and examines their relationship with the dominant culture. Students will analyze a variety of texts representing the history of ethnicity in this country. Topics will vary.

### **LTEN 180. Chicano Literature in English (4)**

Introduction to the literature in English by the Chicano population, the men and women of Mexican descent who live and write in the United States. Primary focus on the contemporary period.

### **LTEN 183. Afro-American Prose (4)**

Analysis and discussion of the novel, the personal narrative, and other prose genres, with particular emphasis on the developing characteristics of Afro-American narrative and the cultural and social circumstances that influence their development.

### **LTEN 184. Afro-American Poetry (4)**

Close reading and analysis of selected works of Afro-American poetry as they reflect styles and themes that recur in the literature.

### **LTEN 185. Themes in Afro-American Literature (4)**

An intensive examination of a characteristic theme, special issue, or period in Afro-American literature. May be repeated for credit when topics vary.

### **LTEN 186. Literature of the Harlem Renaissance (4)**

The Harlem Renaissance (1917-39) focuses on the emergence of the "New Negro" and the impact of this concept on black literature, art, and music. Writers studied include Claude McKay, Zora N. Hurston, and Langston Hughes. Special emphasis on new themes and forms.

### **LTEN 187. Black Music/Black Texts: Communication and Cultural Expression (4)**

Explores roles of music as a traditional form of communication among Africans, Afro-Americans, and West Indians. Special attention given to poetry of black music, including blues, and other forms of vocal music expressive of contestatory political attitudes.

### **LTEN 188. Contemporary Caribbean Literature (4)**

This course will focus on contemporary literature of the English-speaking Caribbean. The parallels and contrasts of this Third World literature with those of the Spanish- and French-speaking Caribbean will also be explored.

### **LTEN 190. Seminars (4)**

These seminars are devoted to a variety of special topics, including the works of single authors, genre studies, problems in literary history, relations between literature and the history of ideas, literary criticism, literature and society, and the like. The student may enroll in more than one section in a single quarter.

*Prerequisites: upper-division standing and permission of department.*

### **LTEN 196. Honors Thesis (4)**

Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed LTGN 191. Oral exam.

### **LTEN 198. Directed Group Study (4)**

Research seminars and research, under the direction of a member of the staff. May be repeated for credit three times.(P/NP grades only.) *Prerequisite: permission of department.*

### **LTEN 199. Special Studies (2 or 4)**

Tutorial; individual guided reading in an area not normally covered in courses. May be repeated for credit three times.(P/NP grades only.) *Prerequisite: permission of department.*

## GRADUATE

### **LTEN 211A-B. Old English Literature (4-4)**

LTEN 211A is a study of Old English language, forms, and syntax and a reading of some prose and verse. LTEN 211B is a study of Old English poetry.

### **LTEN 214. Middle English Literature (4)**

Consideration of one or more major figures, texts, or trends in Middle English literature. May be repeated for credit as topics vary.

### **LTEN 221. Sixteenth-Century English Literature (4)**

Critical study of one or more major figures, texts, or literary trends in Tudor England. May be repeated for credit as topics vary.

### **LTEN 222. Elizabethan Studies (4)**

Selected topics in the study of literary, dramatic, and other Elizabethan cultural texts. Emphasis will be upon articulations among a range of discourses, practices, and institutions. May be repeated for credit when topics vary.

### **LTEN 224. Seventeenth-Century English Literature (4)**

Consideration of one or more figures, texts, or trends in seventeenth-century English literature, including the metaphysical poets and Jacobean drama. May be repeated for credit as topics vary.

### **LTEN 226. Shakespeare (4)**

Shakespeare's plays in relation to the Elizabethan background; selected major texts. May be repeated for credit as topics vary.

### **LTEN 231. Restoration and Eighteenth-Century English Literature (4)**

Consideration of one or more figures, texts, or trends in Restoration and eighteenth-century English literature, including Dryden, Pope, Swift, the early novel, satire. May be repeated for credit as topics vary.

### **LTEN 241. English Literature of the Romantic Period (4)**

A study of the major poetry and related prose of early nineteenth-century literature. May be repeated for credit as topics vary.

### **LTEN 245. Nineteenth-Century American Studies (4)**

Consideration of some of the principal writers and movements in nineteenth-century American literature. May be repeated for credit as topics vary.

### **LTEN 246. Victorian Literature (4)**

Consideration of one or more major figures, texts, or trends in the Victorian period. May be repeated for credit as topics vary.

### **LTEN 251. Twentieth-Century English Literature (4)**

Consideration of one or more major figures, texts, or trends in twentieth-century English literature. May be repeated for credit as topics vary.



**LTEN 252. Studies in Modern American Literature and Culture (4)**

Consideration of one or more major figures, texts, or trends in American literature, in particular the relationship between literature and culture. May be repeated for credit as topics vary.

**LTEN 271. Genres in English (4)**

Consideration of one or more genres present in English and/or American literature, for instance, the ballad, landscape poetry, comedy, satire, the familiar essay. May be repeated for credit as topics vary.

**LTEN 281. Practicum in Literary Research and Criticism (4)**

This course will focus on strategies for framing, organizing, and drafting projects in literary research. Students will study and apply various forms of literary methodology and will learn about recent developments in bibliography, textual editing, and research. May be repeated twice for credit as topics vary.

**LTEN 295. M.A. Thesis (1-8)**

Research for the master's thesis. Opened for repeated registration.

**LTEN 296. Research Practicum (1-12)**

Research project to be developed by a small group of students under the continued direction of individual faculty members. Primarily a continuation of a previous graduate seminar. The 296 courses do not count toward the seminar requirement. Repeatable for credit.

**LTEN 297. Directed Studies: Reading Course (1-12)**

This course may be designed according to an individual student's needs when seminar offerings do not cover subjects, genres, or authors of interest. No paper required. The 297 courses do not count toward the seminar requirement. Repeatable for credit.

**LTEN 298. Special Projects: Writing Course (1-12)**

Similar to a 297, but a paper is required. Papers are usually on subject not covered by seminar offerings. Up to two 298s may be applied toward the twelve-seminar requirement of the doctoral program. Repeatable for credit.

**LTEN 299. Dissertation (1-12)**

Research for the dissertation. Offered for repeated registration. Open only to Ph.D. students who have advanced to candidacy.

**■ FRENCH LITERATURE****LOWER DIVISION****Language and Literature Courses**

Ordinarily, students entering the French literature program elect the following sequence: LTFR 2A, 2B, and 50.

**LTFR 2A, 2B, 50. Readings and Interpretations/Advanced Readings and Interpretations (5-5-4)**

A three-quarter sequence designed to prepare students for upper-division French courses. The course is taught entirely in French and emphasizes the development of reading ability, listening comprehension, and conversational and writing skills. It also introduces the student to basic techniques of literary analysis. It is expected that this sequence will be completed in the course of one academic year. These courses may not be repeated for credit. *Prerequisites:* LTFR 2A-LTFR 33/53, 1C/1CX or its equivalent; LTFR 2B-LTFR 2A or its equivalent, LTFR 50-LTFR 2B or its equivalent.

**LTFR 2C. French Composition (4)**

A course in intensive French composition for students who wish to raise the quality of their written French to the level required in upper-division French literature courses.

**UPPER DIVISION**

*Prerequisite: upper-division standing or consent of instructor. All upper-division courses are taught in French. Additional prerequisites may be specified below.*

*Students are strongly encouraged to take LTFR 115 and 116 before enrolling in other upper-division French literature courses.*

**LTFR 115. Themes in French Intellectual and Literary History (4)**

This is the first course in a two-quarter sequence designed as an introduction to French literature and literary history. Each quarter will center on a specific theme or problem. It is recommended that majors whose primary literature is French take this sequence as early as possible. *Prerequisite:* LTFR 50.

**LTFR 116. Themes in French Intellectual and Literary History (4)**

This is the second course in a two-quarter sequence designed as an introduction to French literature and literary history. Each quarter will center on a specific theme or problem. It is recommended that majors whose primary literature is French take this sequence as early as possible. *Prerequisite:* LTFR 50.

**LTFR 121. The Middle Ages and the Renaissance (4)**

Major literary works of the Middle Ages and Renaissance as seen against the historical and intellectual background of the period. Medieval texts in modern French translation. May be repeated for credit as topics vary.

**LTFR 122. Seventeenth Century (4)**

Major literary works of the seventeenth century. May be repeated for credit as topics vary.

**LTFR 123. Eighteenth Century (4)**

Major literary works and problems of the eighteenth century. May be repeated for credit as topics vary.

**LTFR 124. Nineteenth Century (4)**

Major literary works of the nineteenth century. May be repeated for credit as topics vary.

**LTFR 125. Twentieth Century (4)**

Major literary works and problems of the twentieth century. May be repeated for credit as topics vary.

**LTFR 141. French Literature (4)**

One or more periods or authors in French literature. Texts will be read in the original language. May be repeated for credit as topics vary.

**LTFR 142. Genres of French Literature (4)**

An examination of one or more major or minor genres of French literature: for example, drama, novel, poetry, satire, prose poem, essay.

**LTFR 143. Major French Authors (4)**

A study in depth of the works of a major French writer. Recommended for students whose primary literature is French. May be repeated for credit as topics vary.

**LTFR 144. Literature and Ideas (4)**

This course will center on writers or movements of international literary, cultural, or ideological significance. May be repeated for credit when topics vary.

**LTFR 145. Contemporary French Thought (4)**

Presentation of major currents and debates in contemporary philosophy, linguistics, psychoanalysis, anthropology, and social and feminist theory that have led to major changes in French cultural and literary studies.

**LTFR 160. Composition and Stylistics (4)**

Analysis of classical and modern French literary texts to increase the student's sensitivity to style and improve his or her ability to write and speak French.

**LTFR 161. Poetic Analysis (4)**

Through the examination of a group of texts that transcends the boundaries of historical periodization, this course will introduce the student to the basic modes of poetic analysis. The emphasis of the course will be on the acquisition of a method and the mastery of specific techniques of reading poetic texts rather than on their content or on the historical continuity and/or development of their themes or forms.

**LTFR 162. Translation of Literary Texts: French to English (4)**

A workshop in the problems and techniques of literary translation. A good reading knowledge of French is required. This course counts for majors whose primary literature is French. Not applicable to the secondary literature requirement in other literature majors.

**LTFR 163. Translation Workshop (4)**

The course centers on issues in the theory and practice of literary translation. Students should be proficient in French and English. Their primary task will be to translate several literary texts and discuss the versions with the instructor and other course members, and they will also do selected readings in translation theory and in published translations. May be repeated for credit twice. *Prerequisite: department stamp required.*

**LTFR 164. French Civilization (4)**

An introduction to several major sectors and themes of contemporary France: the family, the school system, social structures, the economy, the political structures and parties. Emphasis on vocabulary of these sectors and ability to analyze documents involving such themes.

**LTFR 165. Explication de texte/Close Reading (4)**

A course in a fundamental technique of literary analysis—close reading—central to literary study in France. Designed for upper-division students planning further work in literature. Application of the close-reading technique to a variety of examples from different periods and genres.

**LTFR 190. Seminars (4)**

These seminars are devoted to a variety of special topics, including the works of single authors, genre studies, problems in literary history, relations between literature and the history of ideas, literary criticism, literature and society, and the like. The student may enroll in more than one seminar in a single quarter.

**LTFR 196. Honors Thesis (4)**

Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed LTGN 191. Oral exam.

**LTFR 198. Directed Group Study (4)**

Research seminars and research, under the direction of a member of the staff. (P/NP grades only.) *Prerequisites: upper-division standing and special permission of department.*

**LTFR 199. Special Studies (2 or 4)**

Tutorial; individual guided reading in areas of French literature not normally covered in courses. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

**GRADUATE****LTFR 220. Introduction to Old French Language and Literature (4)**

An introduction to the reading of Old French and a study of the medieval period through original texts. May be repeated for credit as topics vary.

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### **LTFR 221. Renaissance (4)**

Critical study of one or more major figures, texts, or literary trends of the French Renaissance. May be repeated for credit as topics vary.

### **LTFR 222. Seventeenth-Century French Literature (4)**

Consideration of one or more major figures, texts, or trends in seventeenth-century French literature. May be repeated for credit as topics vary.

### **LTFR 223. Eighteenth-Century French Literature (4)**

Consideration of one or more major figures, texts, or trends in eighteenth-century French literature. May be repeated for credit as topics vary.

### **LTFR 224. Nineteenth-Century French Literature (4)**

Consideration of one or more major figures, texts, or trends in nineteenth-century French literature. May be repeated for credit as topics vary.

### **LTFR 225. Twentieth-Century French Literature (4)**

Selected topics in modern French literature and thought. May be repeated for credit as topics vary.

### **LTFR 240. Topics in French Literature (4)**

An examination of one or more major topics in French literature.

### **LTFR 260. Poetic Analysis (4)**

Through the examination of a group of texts that transcends the boundaries of historical periodization, this course will emphasize the methods and techniques of poetic analysis. The particular attention given to one or several approaches to the text—formal, thematic, textual, etc.—as well as the specific composition of the corpus of texts to be studied will vary with each instructor of the course. In every case, however, the focus will be on the assimilation of a method and the mastery of a specific technique of reading poetic texts rather than on their content or on the historical continuity of their themes or forms.

### **LTFR 295. M.A. Thesis (1-8)**

Research for the master's thesis. Opened for repeated registration up to eight units. (S/U grades only.)

### **LTFR 296. Research Practicum (1-12)**

Research project to be developed by a small group of students under the continued direction of individual faculty members. Primarily a continuation of a previous graduate seminar. The 296 courses do not count toward the seminar requirement. Repeatable for credit. (S/U grades only.) *Prerequisite: consent of the instructor.*

### **LTFR 297. Directed Studies: Reading Course (1-12)**

This course may be designed according to an individual student's needs when seminar offerings do not cover subjects, genres, or authors of interest. No paper required. The 297 courses do not count toward the seminar requirement. Repeatable for credit. (S/U grades only.) *Prerequisite: consent of the instructor.*

### **LTFR 298. Special Projects: Writing Course (1-12)**

Similar to a 297, but a paper is required. Papers are usually on subjects not covered by seminar offerings. Up to two 298s may be applied toward the twelve-seminar requirement of the doctoral program. Repeatable for credit. (S/U grades only.) *Prerequisite: consent of the instructor.*

### **LTFR 299. Dissertation (1-12)**

Research for the dissertation. Offered for repeated registration. Open only to Ph.D. students who have advanced to candidacy.

## ■ GENERAL LITERATURE

In both lower- and upper-division general literature courses, texts may be read in English translation when necessary, and lectures and discussions are conducted in English.

## LOWER DIVISION

### **LTGN 4A-B-C-D-E-F. Fiction and Film in Twentieth-Century Societies (4-4-4-4-4)**

A study of modern culture and of the way it is expressed and understood in novels, stories, and films. The sequence aims at an understanding of relationships between the narrative arts and society in the twentieth century, with the individual quarters treating fiction and film of the following language groups:

- 4A. French
- 4B. German
- 4C. Spanish
- 4D. Italian
- 4E. Russian
- 4F. Chinese/Japanese

### **LTGN 6A-B-C. Understanding Literature: Fiction, Poetry, and Drama (4-4-4)**

An introduction to the reading, interpretation, and appreciation of literature, according to the major genres, and corresponding to the three quarters of the academic year. There is a varying emphasis on themes and techniques in selected works from different periods and cultures.

- 6A. Fiction
- 6B. Poetry
- 6C. Drama/Comedy

### **LTGN 19A-B-C. Introduction to the Ancient Greeks and Romans (4-4-4)**

This interdisciplinary sequence includes the literature, mythology, art, philosophy, and history of ancient Greece and Rome, a complex civilization which had a determining influence on all later Western culture.

### **TWS 21-22-23. Third World Literatures (4-4-4)**

(See entry under "Third World Studies" heading.)

The courses in this sequence are equivalent to general literature courses. The sequence satisfies Third College general-education requirements.

## UPPER DIVISION

*Prerequisite: upper-division standing or consent of instructor.*

### **European Literature in Translation**

#### **LTGN 100. The Classical Tradition (4)**

Greek and Roman literature in translation. May be repeated for credit as topics vary.

#### **LTGN 101. Women in Antiquity (4)**

Selected topics in classical culture, including women and myth, women in Greek and Roman society, and the representation of women in classical literature. May be repeated for credit when topics vary.

#### **LTGN 102. Literature of the Renaissance (4)**

A study of literary/humanistic texts from various cultures involved in the European Renaissance.

#### **LTGN 104. Studies in Eighteenth-Century European Literature (4)**

Topics to be considered include the age of sensibility, Enlightenment, neoclassicism. Attention given to historical and cultural contexts.

#### **LTGN 105. European Romanticism (4)**

Attention given to historical and cultural contexts. Topics to be considered include the concept of nature, the reaction to science, the role of the imagination. May be repeated for credit as topics vary.

#### **LTGN 106A-B-C. The Rise of Christianity (4-4-4)**

A study of the origins and development of Christian thought, history, literature, and institutions during the formative period

from the birth of Jesus to the Middle Ages. The first quarter is devoted to the background in post-biblical Judaism and pagan religions during the early Roman Empire. The second quarter focuses on New Testament literature, the early Fathers, and the history of the Church in the Ante-Nicene period (A.D. 325). The third concentrates on the impact of Christianity on Western Europe during the Middle Ages and the fusion of Christian and pagan cultures in the Latin, Germanic, and Celtic traditions. Satisfies the minor in the Humanities Program.

### **LTGN 110A-B-C. Survey of Russian and Soviet Literature in Translation, 1800 to the Present**

A study of literary works from Pushkin to the present.

- 110A—1800–1860
- 110B—1860–1917
- 110C—1917–present

### **LTGN 111. Nineteenth-Century Russian Literature (4)**

A study of literary works from the nineteenth century. May be repeated for credit when topics vary.

### **LTGN 112. Twentieth-Century Russian or Soviet Literature in Translation (4)**

A study of literary work from the twentieth century. May be repeated for credit as topics vary.

### **LTGN 113. Genres in Russian Literature in Translation (4)**

An examination of one or more genres in Russian literature—for example, the novel, the short story, autobiography, drama, poetry. All readings will be in English. May be repeated for credit as topics vary.

### **LTGN 114. Single Authors in Russian Literature in Translation (4)**

A study of literary works by a single Russian author. All readings will be in English. May be repeated for credit when authors vary.

### **LTGN 116. Spanish Literature in Translation (4)**

One or more periods or authors in Spanish literature. Texts may be read in English. May be repeated for credit as topics vary.

### **LTGN 117. French Literature in Translation (4)**

One or more periods or authors in French literature. Texts may be read in English. May be repeated for credit as topics vary.

### **LTGN 118. Italian Literature in Translation (4)**

One or more periods or authors in Italian literature. Texts may be read in English. May be repeated for credit as topics vary.

### **LTGN 119. German Literature in Translation (4)**

One or more aspects of German literature, such as major authors, the contemporary novel, nineteenth-century poetry, German expressionism. Texts may be read in English or the original language. May be repeated for credit as topics vary.

### **LTGN 120. Yiddish Literature in Translation (4)**

Representative works of fiction, drama, poetry, parable, film, and song from Eastern European Jewish culture. Topics include Chasidism, Zionism, the life of the *shtetl*, relations with the biblical and rabbinic traditions, and a study of literary forms and styles. May be repeated for credit as topics vary.

### **LTGN 121. Medieval Studies (4)**

Studies in medieval culture and thought with focus on one of the "three crowns" of Italian literature: Dante, Boccaccio, or Petrarca. May be repeated for credit when course content varies.

### **LTGN 122. Love, War, and Conquest in the Italian Renaissance (4)**

A critical reading of Italian Renaissance texts, with special attention to those themes, forms, and ideological conflicts still operative in today's culture.

### **LTGN 123. Women in Italy (4)**

A study of historical, political, and literary texts regarding women and feminism in Italian society.

**LTGN 124. Italian Romanticism in Translation (4)**

This course will consider the rise of romanticism in Italy and its relationship to European romanticism. Particular attention will most likely be paid to the works of Foscolo and Leopardi. Credit will not be given for both LTGN 124 and LTIT 118, Italian Romanticism.

**LTGN 125. Theory in Italy (4)**

Selected topics in Italian theory, criticism, and philosophy from the eighteenth to twentieth centuries. Will be organized around one or two leading figures in theory and Italy (such as Vico, Crice, or Gramsci). All readings in translation. Repeatable for credit when topics vary.

**Third World Literature in Translation****LTGN 130. Novel and History in the Third World (4)**

This course sets out to explore the relation between the novel and the "dependent" history of the Third World, contrasting and comparing the uses of history in the European novel as defined in the theoretical analysis of Lukacs with uses of history in the Third World novel. An analysis of major themes and movements common to selected ethnic literature in the United States and national literatures in the Third World.

**LTGN 132. African Oral Literature (4)**

This is a survey of various genres of African and oral literary traditions. Although the focus is on oral narrative genres, investigation of proverb, riddle, praise poetry, and epic also falls into the compass of the course. The central concern will be the development and use of a methodology to analyze the aspects of performance, composition, and education in oral traditional systems.

**LTGN 133. Introduction to Literature and Film of Modern Africa (4)**

This course traces the rise of modern literature in traditional African societies disrupted by the colonial and neocolonial experience. Contemporary films by African and Western artists will provide an additional insight into the complex social self-images of the continent.

**LTGN 136. Latin American Literature in Translation (4)**

Reading of representative works in Latin American literature with a view to literary analysis (form, theme, meaning), the developmental processes of the literature, and the many contexts: historical, social, cultural. Texts may be read in English. May be repeated for credit as topics vary.

**LTGN 137. Mexican Literature in Translation (4)**

Study of popular novels, movements, traditions, key authors, or major trends in modern Mexican literature. Texts may be read in English. May be repeated for credit as topics vary.

**LTGN 140A. Classical Chinese Literature in Translation (4)**

The course will focus on a few representative masterpieces of Chinese literature in its classical age, with emphasis on the formal conventions and the social or intellectual presuppositions that are indispensable to their understanding. May be repeated for credit as topics vary.

**LTGN 140B. Modern Chinese Literature in Translation (4)**

A survey of representative works of the modern period from 1919 to 1949. May be repeated for credit as topics vary.

**LTGN 140C. Contemporary Chinese Literature in Translation (4)**

An introductory survey of representative texts produced after 1949, with particular emphasis on the social, cultural, and political changes. May be repeated for credit as topics vary.

**LTGN 142A-B-C-D-E. Earlier Japanese Literature in Translation (4-4-4-4-4)**

An introduction to earlier Japanese (*bungo*) literature in translation. Each course will focus on several works, placing their

forms in the historical context. No knowledge of Japanese required. May be repeated for credit as topics vary.

- 142A. General
- 142B. Poetry
- 142C. Prose Fiction
- 142D. Drama
- 142E. Essay, Travelogue, Diary, etc.

**LTGN 143A-B-C-D-E. Later Japanese Literature in Translation (4-4-4-4-4)**

An introduction to later Japanese (*kogo*) literature in translation. Each course will focus on several "modern" works, placing their form in the historical context. No knowledge of Japanese required. May be repeated for credit as topics vary.

- 143A. General
- 143B. Poetry
- 143C. Prose Fiction
- 143D. Drama/Film
- 143E. Essay, Criticism, etc.

**LTGN 144. A Single Japanese Author (In Translation) (4)**

A good number of Japanese authors are by now well represented in English translation. The course will focus on one writer and his or her relationships to the social context. May be repeated for credit as topics vary.

**LTGN 145. Special Topics in Japanese Literature (4)**

The course will focus on important problematics of literary studies as they relate to Japan (e.g., "feminism," "modernity," "literary mode of production," "Orientalism and nativism"). No knowledge of Japanese required. May be repeated for credit as topics vary.

**LTGN 146. Japanese Literary Works/Writers in Japanese (4)**

Intended for students with the knowledge of the language. Selections range from Heian to contemporary works. Critical examination of the texts; not just translation exercise. May be repeated as topics vary. Consult with the instructor before registering for the course. May be repeated for credit as topics vary.

**Topics in Literature****LTGN 148. The Bible and Western Literature (4)**

Biblical and related texts that influenced the great writers of the Middle Ages and the Renaissance, including selections from the Jewish and Christian scriptures.

**LTGN 149. The Jewish Experience in Literature (4)**

Literary works from various periods dealing with Jewish themes, with an emphasis on modern Jewish writing in America, Russia, etc. May be repeated for credit as topics vary.

**LTGN 150. Jewish Mysticism (4)**

Theological and literary texts covering the broad range of Jewish mystical experience, with discussion of analogous developments in other religious traditions.

**LTGN 151. The Bible: The Prophetic Books (4)**

The prophetic books of the Bible in their historical contexts. The relationship between the prophetic and narrative books. Literary-critical analysis, theological issues, reference to archaeological data.

**LTGN 152. The Bible: The Narrative Books (4)**

Examination of the biblical accounts in their ancient Near Eastern context. Literary-critical, form-critical, and textual analysis. Attention to related literature and to archaeological data; consideration of theological issues.

**LTGN 153. The Bible: The Poetic Books (4)**

Study of biblical poetry, its settings, genres, and themes. Analysis of metre and structure with particular attention to the use of parallel. Comparison with Canaanite and Mesopotamian examples.

**LTGN 154. Medieval Hebrew Literature (4)**

Major literary works of the Middle Ages and Renaissance as seen against the historical and intellectual background of the period.

**LTGN 155. Hebrew Literature: The Modern Period (4)**

Selected topics in modern Hebrew literature.

**LTGN 156. Topics in the Prophets (4)**

Study of a single book, period, or issue in the biblical prophets.

**LTGN 157. Topics in Biblical Narrative (4)**

Study of a single book, period, or issue in the narrative books of the Bible.

**LTGN 158. Topics in Biblical Poetry (4)**

Study of a single book, period, or issue in the poetic books of the Bible.

**LTGN 160. Specialized Genres in Literature (4)**

The study of literary genres that do not fall into the ordinary categories of lyric, drama, and fiction. Topics vary from year to year. May be repeated for credit as topics vary.

**LTGN 161. Epic Poetry (4)**

A study of major epics, in translation if their original language is not English. May be repeated for credit as topics vary.

**LTGN 162. Prose Fiction (4)**

Aspects of prose fiction. Not confined to a single national literature. Texts may be read in English. May be repeated for credit as topics vary.

**LTGN 164. Lyric Poetry (4)**

Studies in lyric poetry. Not confined to a single national literature. Texts may be read in English.

**LTGN 165. Comedy (4)**

Comedy in fiction and film from ancient times to contemporary, including the Bible, Aristophanes, Shakespeare, and modern writers and film makers.

**LTGN 166. The Forms of Folklore (4)**

A survey of the range of folkloristic phenomena as exemplified by major and minor forms—narrative, legend, myth, superstition, speech, custom, games, and music. Examples will be considered both as artistic entities and as social documents.

**LTGN 167. Folk and Fairy Tales (4)**

A study of folk and fairy tales from various cultures, from the point of view of literary form, psychological meaning, and cultural function. May be repeated for credit as topics vary.

**LTGN 171. Children's Literature (4)**

A study of literature written for children in various cultures and periods. May be repeated for credit as topics vary.

**LTGN 172. Adolescent Literature (4)**

A study of fiction written for the young adult in various cultures and periods. Consideration will be given to the young adult hero in fiction. May be repeated for credit as topics vary.

**LTGN 173. Contemporary Literature (4)**

A study of novels and authors of the present and recent times. May be repeated for credit as topics vary.

**LTGN 174. Popular Literature (4)**

A study of various forms of popular literature, such as the Broadway play, song lyrics, the detective novel, etc. May be repeated for credit as topics vary.

**LTGN 175. Words into Images (4)**

With the proliferation of comic books, photostories, films, and television, these efforts toward the visualization of the verbal abstractions of literature have become a central concern of the entertainment industry. This course will explore the cultural implications of the transformation of words into images—what is gained and what is lost in the translation.

## LITERATURE

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### **LTGN 176. The Psychology of the Filmic Text (4)**

This course will examine a variety of films using different perspectives and methods of psychology to analyze the types of problems raised by the nature of cinematic communication. Topics will include an introduction to basic elements of cinematography, theoretical and technical bases of film's "grammar," perception of moving pictures, the function and status of sound, the influence of film on behavior and culture (and vice versa), the representation of psychological and social interaction, the communication of narrative and spatial information, the generation and translation of films' conventions, and the parameters which the medium and the culture impose upon the attempt to express various forms of abstraction in the concrete visual language of film.

### **LTGN 177. Fantasy and Science Fiction (4)**

Works of fantasy and/or science fiction will be studied in their cultural context. May be repeated for credit as topics vary.

### **LTGN 178. Classic Science Fiction Films and Literature (4)**

This course will attempt to define in literature and film the genre of science fiction by tracing the development of its characteristic themes and preoccupations from the first major science fiction film, *Metropolis*, to a recent remake of the classic, *The Thing*.

### **LTGN 179. Contemporary Science Fiction (4)**

In the last twenty years or so a new generation of science fiction writers has taken this relatively young literary genre into new realms of subject matter and technique. In this course some of the most recent works of modern science fiction will be read closely and discussed in depth. May be repeated for credit as topics vary.

### **LTGN 180A. Visual Arts, Film Studies, and Literature: Painting and Literature (4)**

An investigation into themes and styles of mutual relevance to literature and painting. Repeatable for credit when topics vary.

### **LTGN 180B. Visual Arts, Film Studies, and Literature: Photography and Literature (4)**

The history of photography and its effect upon literary descriptions and literary perception (Rf. Barthes, Sontage, et al.). Repeatable for credit when topics vary.

### **LTGN 180C. Visual Arts, Film Studies, and Literature: Art History and Literature (4)**

The study of art history and its effect upon methods and styles in literary history. Repeatable for credit when topics vary.

### **LTGN 180D. Visual Arts, Film Studies, and Literature: Director's Work (4)**

Methods of criticism of author's work applied to the study and analysis of film director's style and work. Repeatable for credit when topics vary.

### **LTGN 180E. Visual Arts, Film Studies, and Literature: Study of Film Movement (4)**

Study of analogies between literary movements and film movements. Repeatable for credit when topics vary.

### **LTGN 180F. Visual Arts, Film Studies, and Literature: Close Analysis of Filmic Text (4)**

Methods of literary analysis applied to the study of shots, sequences, poetics, and deep structure in filmic discourse. Repeatable for credit when topics vary.

### **LTGN 180G. Visual Arts, Film Studies, and Literature: Close Analysis of Filmic Genre (4)**

Methods of literary study of "genre" applied to the study of filmic "genre." Repeatable for credit when topics vary.

### **LTGN 180H. Visual Arts, Film Studies, and Literature: Studies in Film History (4)**

The study of film history and its effects upon methods of styles in literary history. Repeatable for credit when topics vary.

### **LTGN 181. Mythology (4)**

A study of various bodies of myth: their content, form, and meaning. May be repeated for credit as topics vary.

### **LTGN 182. Psychoanalysis and Literature (4)**

Psychoanalytic approaches to art and literature. Readings in psychoanalytic literature and interpretation (from Freud to the present). Psychoanalysis as it defines and is defined by modernity.

### **LTGN 183. Introduction to Semiotics and Applications (4)**

Students should acquire specific techniques and methods of analysis. Applications will vary from year to year, e.g., semiotics of literary discourse, semiotics of cinema, semiotics of legal discourse, etc. May be repeated for credit as topics will necessarily vary.

### **LTGN 184. Ethnopoetics (4)**

An investigation of traditional native poetry and performance art of the Americas in relation to contemporary practices in the non-Indian world. Topics will vary from year to year, including shamanism, ritual performance, mythopoesis, and oral narration. Repeatable for credit when topics vary.

### **LTGN 185. Literature and Ideas (4)**

The course will center on writers or movements of international literary, cultural, or ideological significance. The texts studied, if foreign, may be read either in the original language or in English. May be repeated for credit as topics vary.

### **LTGN 186A-B-C. Modernity and Literature (4-4-4)**

This course explores the various cross-cultural historical, philosophical, and aesthetic ideas which formed the basis of most twentieth-century literature. By pursuing comparatist tenets, this team-taught sequence will draw on diverse influences and areas to illustrate some of the ways in which literature not only reflects historical periods but also defines and shapes them. Literature from the Americas, Europe, Asia, and Africa will be studied through lectures and the reading of texts in English translation.

### **LTGN 187. Women and Literature (4)**

This course will explore the relationship between women and literature, i.e., women as producers of literature, as objects of literary discourse, and as readers. Foreign language texts will be read in translation. May be repeated for credit as topics vary.

### **LTGN 188. Culture, Ideology, and Collective Memory (4)**

How do societies remember (and forget) the past and, through this process of collective memory, conceive their present? What stories are stored, who constructs them, and what purposes do they serve? Readings in the theory of ideology and close study of empirical cases.

### **LTGN 189. Gender Studies (4)**

The study of the construction of sexual differences in literature and culture. May be repeated for credit when topics vary.

## **Seminars/Independent Studies**

### **LTGN 190. Seminars (4)**

These seminars are devoted to a variety of special topics, including the works of single authors, problems in literary history, relations between literature and the history of ideas, literary criticism, literature and society, and the like. The student may enroll in more than one seminar in a single quarter. *Prerequisites: upper-division standing, consent of instructor, and permission of department.*

### **LTGN 191. Honors Seminar (4)**

Explorations in critical theory and method. This course, which is designed to prepare students for the writing of an honors thesis, is open only to literature majors who have been admitted to the Literature Honors Program. Literary texts will be drawn from several languages but will be available in English

translation. (The Honors Seminar may be applied toward the primary concentration in the literature major.)

### **LTGN 195. Apprentice Teaching (0 & 4)**

Undergraduate instructional assistance. Responsibilities both in area of learning and instruction. A student must (1) prepare reading materials assigned by the professor; (2) lead student discussions; (3) assist professor in grading; (4) prepare a report to the professor at the conclusion of the quarter concerning his or her work.

### **LTGN 196. Honors Thesis (4)**

Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed LTGN 191. Oral exam.

### **LTGN 198. Directed Group Study (4)**

Research seminars and research, under the direction of a member of the staff. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

### **LTGN 199. Special Studies (2 or 4)**

Tutorial; individual guided reading in areas of literature (in translation) not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

## GRADUATE

### **LTGN 500. Apprentice Teaching in Literature (2-4)**

Consideration of pedagogical methods appropriate to undergraduate teaching in literature courses under the supervision of instructor of course. Doctoral students in literature are required to participate in undergraduate teaching for a minimum of twelve units (two to four units per quarter) prior to completion of the Ph.D. degree. This requirement is the equivalent of a 50 percent teaching assistantship (four units per quarter for three quarters). May be repeated for credit. (S/U grades only.)

### **LTGN 501. Apprentice Teaching in Humanities (2-4)**

Consideration of pedagogical methods appropriate to undergraduate teaching in humanities sequences under the supervision of instructor of course. Doctoral students in literature are required to participate in undergraduate teaching for a minimum of twelve units (two to four units per quarter) prior to completion of the Ph.D. degree. This requirement is the equivalent of a 50 percent teaching assistantship (four units per quarter for three quarters). May be repeated for credit. (S/U grades only.)

### **LTGN 502. Apprentice Teaching in Muir College (2-4)**

Consideration of pedagogical methods appropriate to undergraduate teaching in Muir College courses under the supervision of instructor of course. Doctoral students in literature are required to participate in undergraduate teaching for a minimum of twelve units (two to four units per quarter) prior to completion of the Ph.D. degree. This requirement is the equivalent of a 50 percent teaching assistantship (four units per quarter for three quarters). May be repeated for credit. (S/U grades only.)

### **LTGN 503. Apprentice Teaching in Third College (2-4)**

Consideration of pedagogical methods appropriate to undergraduate teaching in Third College courses under the supervision of instructor of course. Doctoral students in literature are required to participate in undergraduate teaching for a minimum of twelve units (two to four units per quarter) prior to completion of the Ph.D. degree. This requirement is the equivalent of a 50 percent teaching assistantship (four units per quarter for three quarters). May be repeated for credit. (S/U grades only.)

### **LTGN 504. Apprentice Teaching in Warren College (4)**

Consideration of pedagogical methods appropriate to undergraduate teaching in Warren College courses under the super-



vision of instructor of course. Doctoral students in literature are required to participate in undergraduate teaching for a minimum of twelve units (two to four units per quarter) prior to completion of the Ph.D. degree. This requirement is the equivalent of a 50 percent teaching assistantship (four units per quarter for three quarters). May be repeated for credit. (S/U grades only.)

**LTGN 505. Seminar on Teaching in the Humanities (4)**

A seminar for teaching assistants in the Revelle Humanities/Writing Program. Graduate students appointed to teaching Humanities during the winter and spring quarters must enroll in this seminar during the preceding fall quarter. The course involves the study of major humanistic texts used in the Humanities/Writing Program and the development of interpretive strategies and pedagogical tactics appropriate for teaching beginning undergraduates to read and write about those texts.

**LTGN 506. Apprentice Teaching in Fifth College (4)**

Consideration of pedagogical methods appropriate to undergraduate teaching in Fifth College courses under the supervision of instructor of course. Doctoral students in literature are required to participate in undergraduate teaching for a minimum of twelve units (two to four units per quarter) prior to completion of the Ph.D. degree. This requirement is the equivalent of a 50 percent teaching assistantship (four units per quarter for three quarters). May be repeated for credit. (S/U grades only.)

■ **GERMAN LITERATURE**

**LOWER DIVISION**

**Language and Literature Courses**

**LTGM 2A. Readings and Interpretations (5)**

LTGM 2A follows the basic language sequence of the Department of Linguistics and emphasizes the development of reading ability, listening comprehension, and conversational and writing skills. *Prerequisite: LIGM 1C/1CX or the equivalent or consent of instructor.* The course is designed to prepare students for LTGM 2B and LTGM 2C. Successful completion of LTGM 2A satisfies the requirement for language proficiency in Revelle College.

**LTGM 2B. Advanced Readings and Interpretations (4)**

LTGM 2B is a continuation of LTGM 2A for those students who intend to practice their skills in reading, listening comprehension, and writing on a more advanced level. The literary texts are supplemented by readings from other disciplines as well as audio-visual materials. *Prerequisite: LTGM 2A or consent of instructor.*

**LTGM 2C. Composition and Conversation (4)**

A course designed for students who wish to improve their ability to speak and write German. *Prerequisite: LTGM 2B or equivalent or consent of instructor.*

**LTGM 51-52-53-54. Readings in German Literature and Culture (4-4-4-4)**

An introduction to German literature. May be taken for three quarters, starting with any quarter. The instructor will advise students when they have achieved sufficient proficiency to proceed to upper-division courses which call for an ability to read extensive texts in German. *Prerequisite: adequate proficiency in German to handle course assignments, i.e., successful completion of LTGM 2C, or equivalent preparation.*

51. *Middle Ages and Renaissance*

52. *Classicism and Romanticism: Eighteenth and Nineteenth Centuries*

53. *The Twentieth Century*

54. *Baroque and Enlightenment*

**UPPER DIVISION**

*Prerequisite: upper-division standing or consent of instructor. Normally, a student will be expected to take two courses of the LTGM 51-52-53-54 sequence before being admitted to upper-division courses. Additional prerequisites may be specified below.*

**LTGM 100. German Literature (4)**

One or more aspects of German literature, such as major authors, the contemporary novel, nineteenth-century poetry, German expressionism. The texts studied will be read in the original language. May be repeated for credit as topics vary.

**LTGM 101. Major German Authors (4)**

A study in depth of the works of a major German author. May be repeated for credit as topics vary.

**LTGM 123. Eighteenth-Century German Literature (4)**

Major literary works as seen against the historical and intellectual background of the period. May be repeated for credit as topics vary.

**LTGM 124. Goethe (4)**

Study of some major works in the context of Goethe's life and milieu. Recommended for literature majors whose primary literature is German. May be repeated for credit as topics vary.

**LTGM 125. Nineteenth-Century German Literature (4)**

Major literary works, authors, or movements of the nineteenth century. May be repeated for credit as topics vary.

**LTGM 126. Twentieth-Century German Literature (4)**

Major literary works, authors, or movements of the twentieth century. May be repeated for credit as topics vary.

**LTGM 130. German Literary Prose (4)**

The development of major forms and modes of German literary prose. May be repeated for credit as topics vary.

**LTGM 131. German Dramatic Literature (4)**

The development of the drama in Germany. May be repeated for credit as topics vary.

**LTGM 132. German Poetry (4)**

The development of major forms and modes of German verse. May be repeated for credit as topics vary.

**LTGM 133. The Forms of Folklore (4)**

A survey of the range of folkloristic phenomena as exemplified by major and minor forms—narrative, legend, myth, superstition, speech, custom, games, and music. Examples will be considered both as artistic entities and as social documents.

**LTGM 160. Composition and Stylistics (4)**

Analysis of classical and modern German literary texts to increase the student's sensitivity to style and improve his or her ability to write and speak German. Stylistic variations and potentialities will be explored, various classical and modern texts will be analyzed to establish stylistic criteria and guiding principles. One composition per week on various subjects.

**LTGM 170. Literature and Ideas (4)**

This course will center on German writers or movements of international literary, cultural, or ideological significance. May be repeated for credit as topics vary.

**LTGM 190. Seminars (4)**

These seminars are devoted to a variety of special topics, including the works of single authors, genre studies, problems in literary history, relations between literature and the history of ideas, literary criticism, literature and society, and the like.

**LTGM 196. Honors Thesis (4)**

Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed LTGN 191. Oral exam.

**LTGM 198. Directed Group Study (4)**

Research seminars and research, under the direction of a member of the staff. May be repeated for credit. (P/NP grades only.) *Prerequisite: permission of department.*

**LTGM 199. Special Studies (2 or 4)**

Tutorial; individual guided reading in areas of German literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

**GRADUATE**

**LTGM 202. Methods and Tools of Research (4)**

A pragmatic workshop to familiarize students with basic methodological approaches, standard works of literary criticism, and indispensable tools of literary research.

**LTGM 203. Cultural History of the German Language (4)**

Philological survey of the German language, with particular attention to historical, cultural, and social interrelations.

**LTGM 210A-B. Middle High German (4-4)**

*210A:* Introduction to the middle High German language. Reading of texts, with exercises in semantics, grammar, etymology, and syntax. *210B:* Middle High German II. Analysis of texts representing a variety of genres.

**LTGM 221. Middle High German Classicism (4)**

Medieval epics (heroic and Arthurian) and courtly poetry. Analysis: methods of interpretation and recent research. May be repeated for credit as topics vary.

**LTGM 231. Eighteenth-Century German Literature (4)**

Consideration of one or more major figures, texts, or trends in eighteenth-century German literature. May be repeated for credit as topics vary.

**LTGM 238. Goethe (4)**

A study of Goethe's work in the context of Goethe's life and milieu and of German classicism. May be repeated for credit as topics vary.

**LTGM 241. German Romanticism (4)**

Studies in the prose, poetry, and theoretical writings of German romantics. May be repeated for credit as topics vary.

**LTGM 242. Nineteenth-Century German Literature (4)**

Consideration of one or more major figures, texts, or trends in nineteenth-century German literature. May be repeated for credit as topics vary.

**LTGM 251. The Twentieth Century (4)**

A study of the structural, philosophical, and social aspects of twentieth-century German literature. May be repeated for credit as topics vary.

**LTGM 252. Major German Authors (4)**

A study in depth of the work of one major German author. May be repeated for credit as topics vary.

**LTGM 272. Genres, Trends, and Forms (4)**

Seminars on literary genres, trends, movements, schools, and on aspects of literary forms and structures in any given era or over a certain period of time. May be repeated for credit as topics vary.

**LTGM 295. M.A. Thesis (1)**

Research for the master's thesis. Opened for repeated registration up to eight units. (S/U grades only.)

**LTGM 296. Research Practicum (1-12)**

Research project to be developed by a small group of students under the continued direction of individual faculty members. Primarily a continuation of a previous graduate seminar. The 296 courses do not count toward the seminar requirement. Repeatable for credit.



## LITERATURE

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### **LTGM 297. Directed Studies: Reading Course (1-12)**

This course may be designed according to an individual student's needs when seminar offerings do not cover subjects, genres, or authors of interest. No paper required. The 297 courses do not count toward the seminar requirement. Repeatable for credit.

### **LTGM 298. Special Projects: Writing Course (1-12)**

Similar to a 297, but a paper is required. Papers are usually on subjects not covered by seminar offerings. Up to two 298s may be applied toward the twelve-seminar requirement of the doctoral program. Repeatable for credit.

### **LTGM 299. Dissertation (1-12)**

Research for the dissertation. Offered for repeated registration. Open only to Ph.D. students who have advanced to candidacy. (S/U grades only.)

## ■ GREEK LITERATURE

### LOWER DIVISION

#### **LTGK 1. Beginning Greek (4)**

Study of ancient Greek, including grammar and reading.

#### **LTGK 2. Intermediate Greek (I) (4)**

Continuation of study of ancient Greek, including grammar and reading. *Prerequisite: LTGK 1 or equivalent.*

#### **LTGK 3. Intermediate Greek (II) (4)**

Continuation of study of ancient Greek, including grammar and reading of texts. *Prerequisites: LTGK 1 and 2 or equivalent.*

#### **LTGK 4. Intensive Elementary Greek (12)**

Equivalent of LTGK 1, 2, and 3. Given in Summer Session only.

### UPPER DIVISION

*Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.*

#### **LTGK 100. Introduction to Greek Literature (4)**

Reading and discussion of selections from representative authors. Review of grammar as needed. *Prerequisite: LTGK 3 or equivalent.*

#### **LTGK 101. Greek Composition (4)**

Greek prose composition. *Prerequisite: completion of LTGK 100. Students must be concurrently enrolled in an upper-division LTGK course numbered 110 or above.*

#### **LTGK 110. Archaic Period (4)**

Readings, in Greek, of texts from the archaic period. May be repeated for credit as topics vary.

#### **LTGK 112. Homer (4)**

Readings from the works of Homer. Repeatable for credit when texts and material vary.

#### **LTGK 113. Classical Period (4)**

Readings, in Greek, of texts from the fifth and fourth centuries B.C. May be repeated for credit as topics vary.

#### **LTGK 118. Hellenistic Period (4)**

Readings, in Greek, of texts from the Hellenistic period. May be repeated for credit as topics vary.

#### **LTGK 120. New Testament Greek (4)**

Readings, in Greek, in the Greek New Testament. May be repeated for credit as topics vary.

#### **LTGK 130. Tragedy (4)**

Readings, in Greek, of one or more of the works of the classical tragedians Aeschylus, Sophocles, and Euripides. May be repeated for credit as topics vary.

#### **LTGK 131. Comedy (4)**

Readings, in Greek, of one or more of the works of Aristophanes. May be repeated for credit as topics vary.

#### **LTGK 132. History (4)**

Readings, in Greek, in the works of the ancient historians, including Herodotus, Thucydides, Xenophon, and others. May be repeated for credit as topics vary.

#### **LTGK 133. Prose (4)**

Readings, in Greek, in the works of ancient prose writers. May be repeated for credit as topics vary.

#### **LTGK 134. Epic Poetry (4)**

Readings, in Greek, in the works of Homer, Hesiod, and/or Apollonius Rhodius. May be repeated for credit as topics vary.

#### **LTGK 135. Lyric Poetry (4)**

Readings, in Greek, of the works of the ancient lyric poets. May be repeated for credit as topics vary.

#### **LTGK 190. Seminars (4)**

These seminars are devoted to a variety of special topics, including the works of single authors, genre studies, problems in literary history, relations between literature and the history of ideas, literary criticism, literature and society, and the like. The student may enroll in more than one seminar in a single quarter. May be repeated for credit when topics vary.

#### **LTGK 198. Directed Group Study (4)**

Directed group study in areas of Greek literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

#### **LTGK 199. Special Studies (2 or 4)**

Tutorial; individual guided reading in areas of Greek literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

## GRADUATE

#### **LTGK 297. Directed Studies (1-12)**

Guided and supervised reading in a broad area of Greek literature. Offered for repeated registration. (S/U grades only.)

#### **LTGK 298. Special Projects (4)**

Treatment of a special topic in Greek literature. Offered for repeated registration. (S/U grades only.)

## ■ HEBREW LITERATURE

### UPPER DIVISION

*Prerequisite: upper-division standing or consent of instructor.*

#### **LTHE 148. The Bible and Western Literature (4)**

Biblical and related texts that influenced the great writers of the Middle Ages and Renaissance, including selections from the Jewish and Christian scriptures.

#### **LTHE 151. The Bible: The Prophetic Books (4)**

The prophetic books of the Bible in their historical contexts. The relationship between the prophetic and narrative books. Literary-critical analysis, theological issues, reference to archaeological data.

#### **LTHE 152. The Bible: The Narrative Books (4)**

Examination of the biblical accounts in their ancient Near Eastern context. Literary-critical, form-critical, and textual analysis. Attention to related literature and to archaeological data; consideration of theological issues.

#### **LTHE 153. The Bible: The Poetic Books (4)**

Study of biblical poetry, its settings, genres, and themes. Analysis of metre and structure, with particular attention to the use of parallel. Comparison with Canaanite and Mesopotamian examples.

#### **LTHE 154. Medieval Hebrew Literature (4)**

Major literary works of the Middle Ages and Renaissance as seen against the historical and intellectual background of the period.

#### **LTHE 155. Hebrew Literature: The Modern Period (4)**

Selected topics in modern Hebrew literature.

#### **LTHE 156. Topics in the Prophets (4)**

Study of a single book, period, or issue in the biblical prophets.

#### **LTHE 157. Topics in Biblical Narrative (4)**

Study of a single book, period, or issue in the narrative books of the Bible.

#### **LTHE 158. Topics in Biblical Poetry (4)**

Study of a single book, period, or issue in the poetic books of the Bible.

#### **LTHE 190. Seminars (4)**

These seminars are devoted to a variety of special topics, including works of single authors, genre studies, problems in literary history, relations between literature and the history of ideas, literary criticism, literature and society, and the like. The student may enroll in more than one section in a single quarter.

#### **LTHE 198. Directed Group Study (4)**

Directed group study in areas of Hebrew literature not normally covered in courses. (P/NP grades only.) *Prerequisite: permission of department.*

#### **LTHE 199. Special Studies (2 or 4)**

Tutorial; individual guided reading in areas of Hebrew literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

The following summer session course may be of interest:

#### **LTHE 197. Field Study: Archaeology and the Bible (4-8)**

Lectures and field work in excavations at the sites of importance to biblical archaeology. Students are expected to produce substantial final papers.

## GRADUATE

#### **LTHE 297. Directed Studies (1-12)**

Guided and supervised reading in a broad area of Hebrew literature. Offered for repeated registration. (S/U grades only.)

#### **LTHE 298. Special Projects (4)**

Treatment of a special topic in Hebrew literature. Offered for repeated registration. (S/U grades only.)

## ■ ITALIAN LITERATURE

### LOWER DIVISION

*See Department of Linguistics for course offerings in first-year Italian.*

#### **LTIT 2A. Advanced Italian I (5)**

A second-year course in Italian language and literature. Conversation, composition, grammar review, and an introduction to literary and nonliterary texts. *Prerequisite: LIIT 1C/1CX or equivalent or consent of instructor.*

#### **LTIT 2B. Advanced Italian II (5)**

Emphasis on composition discussion of literary texts in Italian. *Prerequisite: LTIT 2A or equivalent or consent of instructor.*

**LTIT 50. Advanced Italian (III) (4)**

This course constitutes the sixth and final quarter of the Italian language sequence. It offers an intensive study of Italian grammar, drills in conversation and composition, and readings in modern Italian literature. *Prerequisite: LTIT 2A and 2B, or consent of instructor.*

**UPPER DIVISION**

*Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.*

**LTIT 100. Introduction to Italian Literature (4)**

Reading and discussion of selections from representative authors. Review of grammar as needed. *Prerequisite: LTIT 50 or equivalent or consent of instructor.*

**LTIT 110. Italian Literature (4)**

One or more periods of authors in Italian literature. May be repeated for credit as topics vary.

**LTIT 113. Love, War, and Conquest in the Italian Renaissance (4)**

A critical reading of Italian Renaissance texts with special attention to those themes, forms, and ideological conflicts still operative in today's culture. May be repeated for credit when topics vary.

**LTIT 115. Medieval Studies (4)**

Studies in medieval culture and thought with focus on one of the "three crowns" of Italian literature: Dante, Boccaccio, or Petrarca. May be repeated for credit when course content varies. *Prerequisite: upper-division standing or consent of instructor.*

**LTIT 116. Sixteenth-Century Prose (4)**

Reading and discussion of sixteenth-century Italian novelle, philosophy, history, and scientific texts. May be repeated for credit when topics vary. *Prerequisite: LTIT 100 or permission of instructor.*

**LTIT 118. Italian Romanticism (4)**

This course will consider the rise of romanticism in Italy and its relationship to European romanticism. Particular attention will most likely be paid to the works of Foscolo and Leopardi. Credit will not be given for both LTIT 118 and LTGN 124, Italian Romanticism in Translation.

**LTIT 122. Studies in Modern Italian Culture (4)**

Politics, literature, and cultural issues of twentieth-century Italy.

**LTIT 136. Studies in Modern Poetry**

A study of the chief modern Italian poets, including Montale, Ungaretti, and Quasimodo, with attention to long poetic form and contemporary Italian culture.

**LTIT 137. Studies in Modern Italian Prose (4)**

A study of the chief modern Italian *prosatori*, including D'Annunzio, Calvino, Pavese, Pasolini, etc.

**LTIT 138. Contemporary Italian Thought (4)**

Presentation of major currents and debates in contemporary philosophy, anthropology, political theory, sociology, and feminism that have had an impact on Italian cultural studies. May be repeated for credit when topics vary. *Prerequisite: LTIT 100 or permission of instructor.*

**LTIT 139. Italy and the Question of Subaltern Cultures (4)**

Subaltern studies from Gramsci to Lombardi-Satriani to Cirese, with emphasis on issues of textuality. *Prerequisite: LTIT 100 or permission of instructor.*

**LTIT 140. Women in Italy (4)**

A study of historical, political, and literary texts regarding women and feminism in Italian society.

**LTIT 143. Major Italian Authors (4)**

A study in depth of the works of a major Italian author. May be repeated for credit when topics vary. *Prerequisite: LTIT 100 or permission of instructor.*

**LTIT 161. Advanced Stylistics and Conversation (4)**

Analysis of Italian essays, journalism, literature. Intensive practice in writing and Italian conversation. *Prerequisite: LTIT 100 or consent of instructor.*

**LTIT 162. Translation (4)**

This course will concentrate on further developing writing and composition skills through translation exercise. Translation will be both from English to Italian and from Italian to English in order to give the greatest amount of practice in moving from one language to another. *Prerequisite: LTIT 161.*

**LTIT 190. Seminars (4)**

These seminars are devoted to a variety of special topics, including the works of single authors, genre studies, problems in literary history, relations between literature and the history of ideas, literary criticism, literature and society, and the like. The student may enroll in more than one seminar in a single quarter. *Prerequisites: upper-division standing, consent of instructor, and permission of department.*

**LTIT 198. Directed Group Study (4)**

Directed group study in areas of Italian literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

**LTIT 199. Special Studies (2 or 4)**

Tutorial; individual guided reading in areas of Italian literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

**GRADUATE****LTIT 297. Directed Studies (1-12)**

Guided and supervised reading in a broad area of Italian literature. Offered for repeated registration. (S/U grades only.)

**LTIT 298. Special Projects (4)**

Treatment of a special topic in Italian literature. Offered for repeated registration. (S/U grades only.)

The following Summer Session courses may be of interest:

**LTIT 7A-B-C. Introductory Intensive Italian (4-4-4)**

The equivalent of a full year of Italian language is covered. Through a total immersion approach, students will be able to develop proficiency in grammar, essential reading and writing skills, basic comprehension and production of spoken Italian and language functions. Given in Summer Session only.

**LTIT 40. Conversational Intermediate Italian (4)**

Students improve their verbal skills through group conversations about issues relevant to modern life in Italy and their own life in America. Italian current events and society are discussed; students contribute oral presentations on Italian topics. Given in Summer Session only. *Prerequisite: Linguistics/Italian 1C/1CX or consent of instructor.*

**■ LATIN LITERATURE****LOWER DIVISION****LTLA 1. Beginning Latin (4)**

Study of Latin, including grammar and reading.

**LTLA 2. Intermediate Latin (I) (4)**

Study of Latin, including grammar and reading. *Prerequisite: LTLA 1 or its equivalent.*

**LTLA 3. Intermediate Latin (II) (4)**

Study of Latin, including grammar and reading. *Prerequisite: LTLA 2 or its equivalent.*

**LTLA 4. Intensive Elementary Latin (12)**

Equivalent of LTLA 1, 2, and 3. Given in Summer Session only.

**UPPER DIVISION**

*Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.*

**LTLA 100. Introduction to Latin Literature (4)**

Reading and discussion of selections from representative authors of the Augustan age. Review of grammar as needed. *Prerequisite: LTLA 3 or equivalent.*

**LTLA 101. Latin Composition (4)**

Latin prose composition. *Prerequisite: completion of LTLA 100. Students must be concurrently enrolled in an upper-division LTLA course numbered 111 or above.*

**LTLA 102. Prose Composition (4)**

Designed for those who have completed more than one upper-division course. Latin prose composition is aimed at refining students' grasp of Latin and appreciation of its varying styles through graded exercises in writing and selected readings. What is gained in such a course is a knowledge of the language from the inside out, rather than the opposite, which is usual in translation courses.

**LTLA 111. Pre-Augustan (4)**

Readings, in Latin, in the works of Roman writers of the pre-Augustan period. May be repeated for credit as topics vary.

**LTLA 113. Augustan (4)**

Readings, in Latin, in the works of Roman writers of the Augustan period. May be repeated for credit as topics vary.

**LTLA 114. Vergil (4)**

Readings from the works of Vergil. Repeatable for credit when texts and material vary.

**LTLA 116. Silver Latin (4)**

Readings, in Latin, in the works of Roman writers of the Silver Age. May be repeated for credit as topics vary.

**LTLA 120. Late Latin (4)**

Readings, in Latin, in the works of Roman writers of the post-Silver Age. May be repeated for credit as topics vary.

**LTLA 126. Renaissance Latin (4)**

Readings, in Latin, in the works of the Renaissance period. May be repeated for credit as topics vary.

**LTLA 130. The Novel (4)**

Readings, in Latin, in the works of the Latin novelists. May be repeated for credit as topics vary.

**LTLA 131. Prose (4)**

Readings, in Latin, of the work of Roman prose writers. May be repeated for credit as topics vary.

**LTLA 132. Lyric and Elegiac Poetry (4)**

Readings, in Latin, in the works of lyric and elegiac poets. May be repeated for credit as topics vary.

**LTLA 133. Epic (4)**

Readings, in Latin, in the works of Roman epic poets. May be repeated for credit as topics vary.

**LTLA 134. History (4)**

Readings, in Latin, in the works of Roman historians. May be repeated for credit as topics vary.

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### LTLA 190. Seminars (4)

These seminars are devoted to a variety of special topics, including the works of single authors, genre studies, problems in literary history, relations between literature and the history of ideas, literary criticism, literature and society, and the like. The student may enroll in more than one seminar in a single quarter. Repeatable for credit when topics vary.

### LTLA 198. Directed Group Study (4)

Directed group study in areas of Latin literature not normally covered in courses. May be repeated three times. (P/NP grades only.) *Prerequisites:* upper-division standing and permission of department.

### LTLA 199. Special Studies (2 or 4)

Tutorial; individual guided reading in areas of Latin literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites:* upper-division standing and permission of department.

## GRADUATE

### LTLA 297. Directed Studies (1-12)

Guided and supervised reading in a broad area of Latin literature. Offered for repeated registration. (S/U grades only.)

### LTLA 298. Special Projects (4)

Treatment of a special topic in Latin literature. Offered for repeated registration. (S/U grades only.)

## RUSSIAN LITERATURE

### LOWER DIVISION

#### LTRU 1A-B-C. First-Year Russian (5-5-5)

First-year Russian, with attention to reading, writing, and speaking.

#### LTRU 2A-B-C. Second-Year Russian (5-5-5)

Second-year Russian grammar, with attention to reading, writing, and speaking. *Prerequisite:* LTRU 1A-B-C or equivalent.

### UPPER DIVISION

*Prerequisite:* upper-division standing or consent of instructor. Additional prerequisites may be specified below.

#### LTRU 101A-B-C. Advanced Russian (4-4-4)

Third-year Russian. Advanced grammar and stylistics, introduction to analysis of Russian literary texts.

#### LTRU 110A-B-C. Survey of Russian and Soviet Literature in Translation, 1800-Present (4-4-4)

A study of literary works from Pushkin to the present. *LTRU 110A is not a prerequisite for LTRU 110B, and LTRU 110B is not a prerequisite for LTRU 110C.*

110A—1800-1860

110B—1860-1917

110C—1917-present

#### LTRU 123. Single Author in Russian Literature (4)

Study of the works of a single Russian author. May be repeated for credit two times. *Prerequisite:* LTRU 101C, its equivalent, or permission of instructor.

#### LTRU 128. Single Author in Soviet Literature (4)

Study of the works of a single author from the Soviet period. May be repeated for credit two times. *Prerequisite:* LTRU 101C, its equivalent, or permission of instructor.

#### LTRU 129. Twentieth-Century Russian or Soviet Literature (4)

A study of literary works from the twentieth century. May be repeated for credit as topics vary. *Prerequisite:* upper-division standing or consent of instructor.

#### LTRU 130. Genres in Russian Literature (4)

An examination of one or more genres in Russian literature—for example, the novel, the short story, autobiography, drama, poetry. May be repeated for credit as topics vary. *Prerequisite:* LTRU 101C, its equivalent, or consent of instructor.

#### LTRU 131. Russian Short Fiction (4)

A study of short works of fiction by a selection of Russian or Soviet authors. May be repeated for credit. *Prerequisite:* LTRU 101C, its equivalent, or permission of instructor.

#### LTRU 132. Russian Poetry (4)

Survey of Russian poetry from the late eighteenth century to the Revolution. *Prerequisite:* LTRU 101C, its equivalent, or permission of instructor.

#### LTRU 133. Russian and Soviet Drama (4)

A study of Russian and/or Soviet drama. Authors and topics may vary. May be repeated for credit. *Prerequisite:* LTRU 101C, its equivalent, or permission of instructor.

#### LTRU 160. Russian Stylistics and Grammar (4)

Study of style in various textual and spoken genres of Russian. Review of grammar, geared toward individual student needs, and encouraging independent study of the language beyond this course. *Prerequisites:* LTRU 101A-B-C or the equivalent.

#### LTRU 190. Seminars (4)

These seminars are devoted to a variety of special topics, including the works of single authors, genre studies, problems in literary history, relations between literature and the history of ideas, literary criticism, literature and society, and the like. The student may enroll in more than one section in a single quarter. *Prerequisites:* upper-division standing and consent of instructor.

#### LTRU 198. Directed Group Study (4)

Directed group study in areas of Russian literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites:* upper-division standing and permission of department.

#### LTRU 199. Special Studies (2 or 4)

Tutorial; individual guided reading in areas of Russian literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites:* upper-division standing and permission of department.

## SPANISH LITERATURE

### LOWER DIVISION

#### Language and Literature Courses

Ordinarily, students entering the Spanish literature program elect the following sequence: LTSP 2A-B-C, 50A-B-C.

#### LTSP 2A. Readings and Composition (5)

The course is taught entirely in Spanish and emphasizes the development of reading ability, listening, comprehension, and writing skills. It includes intensive grammar review, weekly compositions, and class discussions. The course is designed to prepare students for LTSP 2B and 2C. *Prerequisite:* basic language proficiency (550 plus oral interview) or completion of LISP 33/53 or 1C/1CX. Successful completion of LTSP 2A satisfies the requirement for language proficiency in Revelle College.

#### LTSP 2B. Readings and Interpretations (5)

This course further reviews major points of grammar and emphasizes critical reading and interpretation of Spanish texts through class discussion, vocabulary development, and written compositions. It is a continuation of LTSP 2A. *Prerequisite:* LTSP 2A or consent of instructor.

#### LTSP 2C. Cultural Readings and Composition (4)

This course is a continuation of LTSP 2B, with special emphasis on problems in writing and translation. It includes class discussion of cultural topics as well as grammar review and composition. The course will further develop the ability to read articles, essays, and longer pieces of fictional/nonfictional texts. *Prerequisite:* LTSP 2B or equivalent. (Numbered 40 prior to fall 1989.)

#### LTSP 2D. Advanced Readings and Composition (4)

Designed for bilingual students seeking to become biliterate. Reading and writing skills stressed with special emphasis on improvement of written expression and problems of grammar and orthography. Prepares native speakers with little or no formal training in Spanish for more advanced courses. *Prerequisite:* native speaking ability and/or recommendation of instructor.

#### LTSP 7. Introductory Intensive Spanish (8)

This course will offer highly intensive Spanish language instruction to beginning language students. The course will enable students to develop basic language skills, to include listening comprehension, speaking, reading and writing, through a total immersion approach, with a focus on the acquisition of language functions. (Offered in summer session only.)

#### LTSP 50A. Readings in Peninsular Literature (4)

An introduction to Peninsular literature, this course offers a selection of major works and introduces students to literary analysis through reading extensive texts in Spanish. Two or more quarters of courses in the 50 series are suggested before students proceed to upper-division courses. *Prerequisites:* two years of college Spanish or the equivalent.

#### LTSP 50B. Readings in Latin American Literature (4)

An introduction to Latin American literature, this course offers a selection of major works and introduces students to literary analysis through reading extensive texts in Spanish. Two or more quarters of courses in the 50 series are suggested before students proceed to upper-division courses. *Prerequisites:* two years of college Spanish or the equivalent.

#### LTSP 50C. Readings in Latin American Topics (4)

An introduction to major topics in Latin American literature, this course focuses on the literature of a particular region, period, or movement. Works vary from those in 50B and introduce students to literary analysis through reading extensive texts in Spanish. *Prerequisites:* two years of college Spanish or the equivalent.

### UPPER DIVISION

*Prerequisite:* upper-division standing or consent of instructor. Additional prerequisites may be specified below.

Note: As of fall 1992, students must have taken at least one (but preferably two) course(s) in the LTSP 50A-B-C sequence with a grade of C— or better before enrolling in upper-division courses. Without fulfillment of this prerequisite, students must obtain the consent of the instructor of the requested course.

#### LTSP 100. Major Works of the Middle Ages (4)

Major Spanish literary works of the Middle Ages and Renaissance as seen against the historical and intellectual back-

ground of the period. May be repeated for credit as topics vary.

**LTSP 102. Topics in Medieval Poetry (4)**

Study of Spanish poetry from the eleventh to the fifteenth century. May be repeated for credit as topics vary.

**LTSP 107. Literature of the Fifteenth Century (4)**

A concentrated study of the Spanish literature of the fifteenth century, including the *Celestina*. May be repeated for credit as topics vary.

**LTSP 110A-B. Major Works of the Renaissance and Baroque (4-4)**

A survey. Historical, but with close reading of the major (complete) texts of the sixteenth and seventeenth centuries. Garcilaso's poetry, *Lazarillo*, Fray Luis, San Juan, Quevedo, Góngora, Lope de Vega, Tirso de Molina, Calderon, Gracian. Cervantes will be read—but not the *Quijote*.

**LTSP 111. Topics in Golden Age Poetry (4)**

A study of the thematic and stylistic evolution, from Garcilaso de la Vega to Góngora. Close textual reading of major poems.

**LTSP 115. Topics in Golden Age Prose (Except Cervantes) (4)**

The topics may vary, as, for example: origins of the modern novel, the picaresque, romances of chivalry, and the appearance of "realism," etc. May be repeated for credit as topics vary.

**LTSP 117. Golden Age Drama (4)**

A close look at the major themes of the Golden Age drama, with special attention to the theater of Lope, Tirso, and Calderon, "National" theatre, and the baroque.

**LTSP 119. Cervantes (4)**

A close study of the *Quijote*. In alternate years Cervantes' other prose works and his theatre will be studied. (Required of all majors.) *Prerequisites: two courses from LTSP 50A-B-C.*

**LTSP 120. Major Works in the Modern Period: from Feijoo to Galdos (4)**

Survey of major figures and movements in Spanish literature from 1700-1880. The selection of works to be studied may vary from year to year, but will always be representative of the main literary and historical developments of this period.

**LTSP 122. The Romantic Movement (4)**

The course will explore the historical context of the emergence of a romantic movement in Spain, particularly the links between romanticism and liberalism. Major romantic works in several genres will be studied in depth.

**LTSP 124. The Nineteenth-Century Novel (4)**

Study of major novelists of the realist tradition. Selection of works and thematic focus may vary.

**LTSP 125. The Generation of '98 (4)**

The course will explore the significant literary tendencies that arose during the crisis of Spanish society at the end of the nineteenth century and the beginning of the twentieth.

**LTSP 127. Modern Drama (4)**

Study of significant developments in Spanish theatre of the nineteenth and twentieth century. Selection of works to be studied will vary at the discretion of the instructor.

**LTSP 128. Modern Poetry (4)**

The course will consider major trends and figures in the development of Spanish poetry throughout the last two centuries. Topics may vary significantly in selection of poets and periods to be studied; thus, course may be repeated for credit when topics vary.

**LTSP 129. Twentieth-Century Prose (4)**

The course will explore significant aspects of Spanish prose literature in this century. Specific topics will vary by genre

(novel, short story, essay) and by period. May be repeated for credit when topics vary.

**LTSP 130A. Development of Spanish Literature (4)**

An introduction to the major movements and periods of Spanish literary history, centered on close reading of representative texts, but aimed at providing a sense of the scope of Spanish literature and its relation to the course of Spain's cultural and social history. This course is required of all Spanish literature majors. *Prerequisites: two courses from LTSP 50A-B-C.*

**LTSP 130B. Development of Latin American Literature (4)**

An introduction to major movements and periods in Latin American literature, centered on a study of key works from pre-Columbian to the present time. Texts will be seen within their sociohistorical context and in relation to main artistic trends of the period. This course is required of all Spanish literature majors. *Prerequisite: two courses from LTSP 50A-B-C.*

**LTSP 131. Spanish American Literature: The Colonial Period (4)**

A study of the major literary works of the Latin American colonial period as seen against the historical context of that period.

**LTSP 132. Spanish American Literature: The Nineteenth Century (4)**

A study of the major literary works and problems of the nineteenth century in Latin America as seen against the historical context of that period.

**LTSP 133. Spanish American Literature: The Twentieth Century (4)**

A study of the major literary works and problems of the twentieth century in Latin America as seen against the historical context of that period.

**LTSP 134. Argentine Literature (4)**

Study of movements, traditions, key authors, or major trends in Argentine literature, such as gaucho poetry, the realist novel, modern urban narrative, the school of Jorge Louis Borges. May be repeated for credit as topics vary.

**LTSP 135. Mexican Literature (4)**

Study of popular novels, movements, traditions, key authors, or major trends in modern Mexican literature. May be repeated for credit as topics vary.

**LTSP 136. Peruvian Literature (4)**

Study of movements, traditions, key authors, or major trends in Peruvian literature, such as the romantic movement, the essay tradition, the rural narrative, the novel of national definition, postmodernist poetry authors such as Vallejo, Arqueadas, Vargas Llosa. May be repeated for credit as topics vary.

**LTSP 137. Caribbean Literature (4)**

Study of movements, traditions, key authors, or major trends in Caribbean literature in Spanish, such as the romantic movement, the literature of independence, the essay tradition, Afro-Antillean literature, the historical novel. May be repeated for credit as topics vary.

**LTSP 140. Spanish American Novel (4)**

A study in depth of selected novelists of Spanish America. May be organized around a specific theme or idea which is traced in its development through the narratives. Course may be repeated for credit when topics vary.

**LTSP 141. Spanish American Poetry (4)**

A critical study of some of the major poets of Spanish America, focusing on the poet's central themes, the evolution of poetic style, and the significance of the poetry to the historical context. May be repeated as topics vary.

**LTSP 142. Spanish American Short Story (4)**

Readings and interpretation of short story form in Latin America. Focus is primarily nineteenth or twentieth century. May be repeated for credit as topics vary.

**LTSP 143. Spanish American Essay (4)**

A study of the essay in Spanish American literature from either an historical or a topical point of view. May be repeated for credit as topics vary.

**LTSP 144. Spanish American Theatre (4)**

This course studies the representative plays of the major dramatists of Latin America. Discusses and analyzes the dramatic works in light of their historical, social, and cultural background. Considers their contribution to the development of a theatrical tradition in Latin America. May be repeated for credit as topics vary.

**LTSP 150. The Development of Chicano Literature (4)**

A cross-genre survey of the major works in Chicano literature from its beginnings to the present, with primary emphasis on contemporary works. Speaking, writing, and reading knowledge of Spanish is required.

**LTSP 151. Themes and Motifs in Chicano Literature (4)**

This course is organized around some of the significant themes and ideas expressed in specific Chicano writings. The importance of these themes to particular Chicano experience is considered. Speaking, writing, and reading knowledge of Spanish is required.

**LTSP 152. Chicano Prose (4)**

Study of the different genres of Chicano prose: novel, short story, poetry, autobiography. Attention is given to Chicano prose styles and the historical and cultural movement in which they develop. Speaking, writing, and reading knowledge of Spanish is required.

**LTSP 153. Chicano Poetry (4)**

The analysis and discussion of the major forms and modes of Chicano poetry, with primary emphasis on the developing styles of the poets and on the study of the texts' and the authors' historical moment. Speaking, writing, and reading knowledge of Spanish is required.

**LTSP 160. Spanish Phonetics (4)**

A comparative study of the English and Spanish phonetics systems. The course will include a study of the organs of articulation, manner of articulation, stress and intonation patterns, as well as dialectal variations in Spanish.

**LTSP 161. Spanish Syntax and Morphology (4)**

An analysis of Spanish syntax and morphology to increase the student's ability to speak and write Spanish.

**LTSP 162. Spanish Language in the United States (4)**

A sociolinguistic study of the popular dialects in the U.S.A. and their relation to other Latin American dialects. The course will cover phonological and syntactic differences between the dialects as well as the influence of English on the Southwest dialects.

**LTSP 163. Spanish Language in America (4)**

A study of the history, structure, and peculiarities of the Spanish language in Latin America with selected readings from Latin American authors utilizing these dialects within their works.

**LTSP 164. Language and Society (4)**

A comparison of language policy in Latin America and that of other Third World countries and its reflection in literature.

**LTSP 165. History of the Spanish Language (4)**

Historical description of Spanish phonology, morphology, and syntax based on readings of the different periods.

**LTSP 166. Creative Writing (4)**

A workshop designed to foster and encourage writing in Spanish of students working on short forms of fiction. The workshop will include discussion of techniques and intensive writing.



## LITERATURE

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### LTSP 170. Literary Criticism (4)

The course will discuss major contemporary critical approaches and the question of their applicability to the analysis of contemporary Latin American, Peninsular, and Chicano literature. Open to literature majors only.

### LTSP 171. Studies in Literature and Society (4)

Focus on interaction between literary expression and the study of society, covering issues such as the sociology of literature, the historical novel, literature and social change, the writer as intellectual. May be repeated for credit as topics vary.

### LTSP 172. Indigenista Themes in Spanish American Literature (4)

Study of the varying literary modes by which nineteenth- and twentieth-century poets and narrators have interpreted the themes of Andean survival in Latin America, primarily in Mexico and the Andean Highlands. May be repeated for credit as topics vary.

### LTSP 173. Problems in Spanish and Spanish American Literary History (4)

Study of the issues involved in understanding the development process of literary expression; the problem of genre; the relation of literature to social institutions; the function of literary influence and tradition; the relation of popular and print cultures. May be repeated for credit as topics vary.

### LTSP 190. Seminars (4)

These seminars are devoted to a variety of special topics, including the works of single authors, genre studies, problems of literary history, relations between literature and the history of ideas, literary criticism, literature and society, and the like. The student may enroll in more than one seminar in a single quarter.

### LTSP 196. Honors Thesis (4)

Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed LTGN 191. Oral Exam.

### LTSP 198. Directed Group Study in Spanish Literature (4)

Research seminars and research, under the direction of a member of the staff. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

### LTSP 199. Special Studies (2 or 4)

Tutorial: individual guided reading in areas of Spanish literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

## GRADUATE

### LTSP 201. Reading Medieval Texts (4)

Introduction to the reading of medieval Spanish. It will provide the student the linguistic and cultural background necessary to go on to more work in depth in the medieval field. May be repeated for credit as topics vary.

### LTSP 202. Spanish Language in America (4)

Selected topics on the history, structure, and peculiarities of the Spanish language in America. May be repeated for credit as topics vary.

### LTSP 208. Textual Criticism in Spanish (4)

Tools and methods of scholarly research in literature for establishing texts from both manuscript and printed sources.

### LTSP 214. Studies in Medieval Literature (4)

Consideration of one or more major figures, texts, trends, or problems in medieval Spanish literature.

### LTSP 216. Fifteenth-Century Spanish Literature and Culture (4)

Consideration of one or more major figures, texts, trends, or problems in fifteenth-century Spanish literature. May be repeated for credit as topics vary.

### LTSP 224. Golden Age Studies (4)

Consideration of one or more major figures, texts, trends, or problems in Spanish Golden Age studies. May be repeated for credit as topics vary.

### LTSP 226. Cervantes (4)

A critical reading of the *Quijote*.

### LTSP 252. Studies in Modern Hispanic Literature and Culture (4)

Major trends and figures considered in the context of late nineteenth- and twentieth-century Hispanic culture. May be repeated for credit as topics vary.

### LTSP 253. Chicano Literature (4)

Study of the particular life experience of the Chicano and the unique expression given that experience by Chicano authors, whether in novels, short stories, poetry, or dramatic works. May be repeated for credit as topics vary.

### LTSP 254. Modern Spanish Poetry (4)

An historical approach to modern Spanish poetry. May be repeated for credit as topics vary.

### LTSP 255. The Modern Spanish Novel (4)

An historical approach to the modern Spanish novel. May be repeated for credit as topics vary.

### LTSP 258. Spanish American Prose (4)

Consideration of one or more major figures, texts, trends, or problems in Spanish American prose. May be repeated for credit as topics vary.

### LTSP 259. Spanish American Poetry (4)

Consideration of one or more major figures, texts, trends, or problems in Spanish American poetry. May be repeated for credit as topics vary.

### LTSP 261. Studies in Spanish Linguistics (4)

A study of current linguistic and psycholinguistic theories and their application to Spanish. The course will focus on grammatical (syntactic and phonological) programs as well as on contemporary theoretical perspectives in the acquisition of language.

### LTSP 264. Bilingualism and Bidialectalism: A Sociolinguistic Study (4)

A study of the relation between language production-reception and contextual factors. The course will examine current theories of language variation and problems of multilingual or bilingual societies determining language shift, maintenance, and standardization.

### LTSP 266. Language Teaching: Theory and Methodology (4)

A study of theories of second language acquisition and methodologies proposed for the teaching of a second language, with particular focus on Spanish language instruction.

### LTSP 272. Literature and Society Studies (4)

Special topics in practical criticism involving social and economic historical perspectives. May be repeated for credit as topics vary.

### LTSP 280. Field Work (4)

Techniques of on-the-spot linguistic and folkloric surveys, including the practice of ballad collections in the Spanish Peninsula. Offered for repeated registration.

### LTSP 281. Practicum in Literary Research and Criticism (4)

This course will focus on strategies for framing, organizing, and drafting projects in literary research. Students will learn

and apply forms of argumentation and persuasion as well as such technicalities as referencing systems, style sheets, and bibliographic techniques. May be repeated twice for credit as topics vary. (S/U grades only.)

### LTSP 295. M.A. Thesis (1-8)

Research for the master's thesis. Open for repeated registration up to eight units. (S/U grades only.)

### LTSP 296. Research Practicum (1-12)

Research project to be developed by a small group of students under the continued direction of individual faculty members. Primarily a continuation of a previous graduate seminar. The 296 courses do not count toward the seminar requirement. Repeatable for credit.

### LTSP 297. Directed Studies: Reading Course (1-12)

This course may be designed according to an individual student's needs when seminar offerings do not cover subjects, genres, or authors of interest. No paper required. The 297 courses do not count toward the seminar requirement. Repeatable for credit.

### LTSP 298. Special Projects: Writing Course (1-12)

Similar to a 297, but a paper is required. Papers are usually on subjects not covered by seminar offerings. Up to two 298s may be applied toward the twelve-seminar requirement of the doctoral program. Repeatable for credit.

### LTSP 299. Dissertation (1-12)

Research for the dissertation. Offered for repeated registration. Open only to Ph.D. students who have advanced to candidacy.

## ■ CRITICAL THEORY/CULTURAL STUDIES

Courses in theory/cultural studies may apply to various literature majors. Please consult your adviser.

Additional theory courses are offered in the various department sections. See quarterly course descriptions in the literature office, first floor LIT building.

Literature/Cultural Studies (LTCS) listed below are pending approval effective fall 1992.

## LOWER DIVISION

### LTCS 50. Introduction to Cultural Studies (4)

An introduction to cultural studies with a focus on the following areas: literary and historical studies, popular culture, women's studies, ethnic studies, science studies, and gay/lesbian studies. Particular emphasis on the question of "cultural practices" and their social and political conditions and effects.

## UPPER DIVISION

*Prerequisite: upper-division standing or consent of instructor.*

### LTCS 100. Theories and Methods in Cultural Studies (4)

Readings in some of the major theoretical texts that have framed work in cultural studies, with particular emphasis on those drawn from critical theory, studies in colonialism, cultural anthropology, feminism, semiotics, gay/lesbian studies, historicism, and psychoanalytic theory. Additional readings in various conceptions of cultural studies.

### LTCS 110. Popular Culture (4)

A reading of recent theory on popular culture and a study of particular texts dealing with popular cultural practices, both contemporary and noncontemporary, as sites of conflict and struggle. Repeatable for credit when topics vary.



**LTCS 120. Historical Perspectives on Culture (4)**

The course will explore the relation among cultural production, institutions, history, and ideology during selected historical periods. In considering different kinds of texts, relations of power and knowledge at different historical moments will be discussed. Repeatable for credit when topics vary.

**LTCS 130. Gender, Race/Ethnicity, Class, and Culture (4)**

The course will focus on the representation of gender, ethnicity, and class in cultural production in view of various contemporary theories of race, sex, and class. Repeatable for credit when topics vary.

**LTCS 140. Subaltern Studies in Context (4)**

This course will explore some basic texts related to subaltern studies and the variations in the field as related to national and historical situations. Repeatable for credit when readings and focus vary.

**LTCS 150. Topics in Cultural Studies (4)**

The course will examine one or more forms of cultural production or cultural practice from a variety of theoretical and historical perspectives. Topics may include: contemporary debates on culture, genres of popular music/fiction/film, AIDS and culture, the history of sexuality, subcultural styles, etc. Repeatable for credit when topics vary.

**LTTH 100. Introduction to Critical Theory (4)**

A critical review of major contemporary theories of the nature of literature, its sociocultural function, and appropriate modes of evaluation.

**LTTH 101. Issues in Feminist Theory (4)**

The study of selected issues in feminist theory, feminist approaches to literature; and the function of feminist critics in society. May be repeated for credit when topics vary.

**LTTH 110. History of Criticism (4)**

A critical and interpretive review of some of the major documents in criticism from the classical period to the present time.

**LTTH 120. Major Figures (4)**

Close study of major critics, as individuals or as groups, from the classical period to the present time. May be repeated for credit when topics vary.

**GRADUATE****LTTH 200A. Text/Culture/Critical Practice (4)**

An introduction to theories and practices of literary and cultural criticism. Topics may vary, but emphasis will be on terminology, methods of readings, modes of interdisciplinary analysis and argumentation, recent debates on questions of theory, history, textual scholarships, etc. *Prerequisite: registered doctoral student in literature.*

**LTTH 200B. Problems in Contemporary Literary Theory (4)**

The focus is feminist literary/cultural theories and their relations with major contemporary theoretical discourses (e.g., psychoanalysis, poststructuralism, and various forms of historicism). *Prerequisite: registered doctoral student in literature.*

**LTTH 200C. Cultural Perspectives and Cultural Criticism (4)**

Literary and cultural relations between the First and Third Worlds, colonialism and neo-colonialism, orality and literacy, construction of ethnicity, formation of canon, and popular culture and the market. *Prerequisite: registered doctoral student in literature.*

**LTTH 210. Major Periods and Movements (4)**

Historically oriented study of past criticism and critical theory as they pertain to contemporary interests and concerns. May be repeated for credit when topics vary.

**LTTH 220. Theories of Literary Criticism (4)**

Close study of any of the several bodies of literary theory currently applied to literary criticism: psychoanalytic, Marxist, historicist, semiotic, feminist, hermeneutic, reader-response, among others. May be repeated for credit when topics vary.

**LTTH 230. Comparative Literary Theory (4)**

Comparison of theoretical approaches across cultures (e.g., East/West studies), across modes of discourse (e.g., oral/written), or across media (e.g., literature/art or literature/music). May be repeated for credit when topics vary.

**LTTH 240. Forms and Genres (4)**

Theory as it focuses on the various literary modes—e.g., narratology, poetics, formalism. May be repeated for credit when topics vary.

**LTTH 270. Psychoanalytic Approaches to Literature (4)**

A systematic study of basic psychoanalytic theory as it applies to literary criticism, with practical psychoanalytical exploration of works from various periods and literatures.

**LTTH 296. Research Practicum (1-12)**

Research project to be developed by a small group of students under the continued direction of individual faculty members. Primarily a continuation of a previous graduate seminar. The 296 courses do not count toward the seminar requirement. Repeatable for credit.

**LTTH 297. Directed Studies: Reading Course (1-12)**

This course may be designed according to an individual student's needs when seminar offerings do not cover subjects, genres, or authors of interest. No paper required. The 297 courses do not count toward the seminar requirement. Repeatable for credit.

**LTTH 298. Special Projects: Writing Course (1-12)**

Similar to a 297, but a paper is required. Papers are usually on subjects not covered by seminar offerings. Up to two 298s may be applied toward the twelve-seminar requirement of the doctoral program. Repeatable for credit.

**WRITING/LITERATURE****LOWER DIVISION****LTWR 8A. Craft of Writing: Fiction (4)**

Study of fiction in terms of structure and content. Plot, description, character, theme, genre, dialogue, and revision studied through readings from throughout the history of the short story. Practical exercises accompany reading assignments. *Prerequisite: Students must have completed their college writing requirements prior to enrollment in LTWR 8A.*

**LTWR 8B. Craft of Writing: Poetry (4)**

Study of poetry in terms of craft and formal structure. Techniques of composition (metrics, narrative voice, personification) studied through written examples of this genre. Practical imitations and exercises accompany reading assignments. *Prerequisite: Students must have completed their college writing requirements prior to enrollment in LTWR 8B.*

**LTWR 8C. Craft of Writing: Nonfiction (4)**

Study of nonfictional prose in terms of genre and craft. Techniques of composition (journalism, essay, letters, reviews) studied through written examples of the genre. Practical imitations and exercises accompany reading assignments. *Prerequisite: Students must have completed their college writing requirements prior to enrollment in LTWR 8C.*

**UPPER DIVISION**

Departmental approval is required for enrollment in all upper-division Lit/Writing courses. *Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.*

*See Department of Theatre for course offerings in dramatic writing.*

**Prose Fiction, Poetry, Media Workshops****LTWR 100. Short Fiction (4)**

A workshop for students with some experience and special interest in writing fiction. This workshop is designed to encourage regular writing in the short forms of prose fiction and to permit students to experiment with various forms. There will be discussion of student work, together with analysis and discussion of representative examples of short fiction from the present and previous ages. May be taken for credit three times. *Prerequisite: LTWR 8A.*

**LTWR 102. Poetry (4)**

A workshop for students with some experience and special interest in writing poetry. This workshop is designed to encourage regular writing of poetry. There will be discussion of student work, together with analysis and discussion of representative examples of poetry from the present and previous ages. May be taken for credit three times. *Prerequisite: LTWR 8B.*

**LTWR 104. The Novel (4)**

A workshop designed to encourage writing of longer narrative forms. There will be discussion of student work, together with analysis and discussion of novels from the present and previous ages. May be taken for credit three times. *Prerequisite: LTWR 8A.*

**LTWR 106. Translation Workshop (4)**

The course centers on issues in the theory and practice of literary translation. Students should be proficient in at least one language other than their native language. Their primary task will be to translate several literary texts and discuss the versions with the instructor and other course members, and they will also do selected readings in translation theory and in published translations. May be taken for credit three times.

**LTWR 110. Screen Writing (4)**

A workshop designed to encourage writing of original screen plays and adaptations. There will be discussion of student work, together with analysis and discussion of representative examples of screen writing. May be taken for credit three times.

**LTWR 111. Prose Poem (4)**

Although prose poems have been written by writers all over the world, the question of what constitutes a prose poem has never been adequately answered. Through practice, we will explore the inner dynamics central to this mixed genre. *Prerequisite: LTWR 8B.*

**LTWR 114. Writing for Television (4)**

A workshop course during which students will be expected to devise and write a one-hour drama script for television, either original or conforming to an already existing drama series, and to consider and respond to each other's work. May be taken for credit three times.

**LTWR 115. Experimental Writing (4)**

This workshop explores writing for which the traditional generic distinctions of prose/poetry, fiction/documentary, narrative/discourse do not apply. Students taking this course will be asked to challenge the boundaries of literature to discover new forms and modes of expression. May be taken for credit three times.

## THE MAKING OF THE MODERN WORLD

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### **LTWR 116. Magazine Writing (4)**

This workshop will encourage students to write as well as they can on the sort of topics that appear in today's better magazines. Exercises will stress various techniques, such as the interview, library research, the use of quotations, factual accuracy, style. By the end of the course, each student will have had to complete one full-length article or essay of at least 4,000 words. May be repeated for credit one time.

### **LTWR 118. Writing for Radio (4)**

A workshop in writing for radio. Students will learn basic techniques of scripting, dialogue, news reporting, and feature writing. Evaluation will be based on creative exercise and peer critique. May be repeated once for credit when projects vary.

### **Nonfiction Prose Workshops**

#### **LTWR 120. Personal Narrative (4)**

A workshop designed to encourage regular writing of all forms of personal experience narrative, including journals, autobiography, firsthand biography, and firsthand chronicle. Instructor and students will discuss student work as well as published personal narratives. May be taken for credit three times. *Prerequisite: LTWR 8C.*

#### **LTWR 121. Reportage (4)**

A workshop designed to encourage the full range of reportage writing: observations, interviews, case studies, profiles, reporter-at-large. Instructor and students will discuss student work and published reportage. May be taken for credit three times. *Prerequisite: LTWR 8C.*

#### **LTWR 122. Writing for the Sciences (4)**

A workshop in the writing of scientific or technical reports. Instructor and students will discuss student work, exploring the particular constraints and possibilities of science writing. May be taken for credit three times. *Prerequisite: LTWR 8C.*

#### **LTWR 123. Writing for the Social Sciences (4)**

A workshop in the writing of reports (reviews, analyses, field studies, surveys) in the social sciences. Instructor and students will discuss student work, exploring the particular constraints and possibilities of the various forms of social science writing. May be taken for credit three times. *Prerequisite: LTWR 8C.*

#### **LTWR 124. Writing Literary Criticism (4)**

A workshop designed to encourage regular writing of literary criticism. Instructor and students will discuss student work. May be taken for credit three times. *Prerequisite: LTWR 8C.*

#### **LTWR 125. Persuasion (4)**

A workshop in the writing of argument or persuasion, with particular attention to strategies of persuasion for different kinds of audiences. Instructor and students will discuss student work as well as published work. May be taken for credit three times. *Prerequisite: LTWR 8C.*

#### **LTWR 127. General Nonfiction Prose Workshop (2)**

A workshop designed to encourage the writing of all forms of nonfiction prose. This workshop is usually limited to advanced students in the writing major. May be taken for credit three times. *Prerequisite: LTWR 8C.*

### **Writing Process, Written Discourse, and Writing Pedagogy**

These courses are not writing workshop courses like those listed above. Rather, they examine various aspects of writing as a field of study and writing pedagogy. Writing majors who plan to teach writing may be particularly interested in these courses. See the department for applicability of these courses to the writing major requirements.

Note: As of fall 1991, all writing majors are required to take one course chosen from offerings numbered LTWR 140-144 to fulfill one of their upper-division requirements.

#### **LTWR 140. History of Writing (4)**

A review of the history of the development of alphabets and writing systems. Survey of the rise of literacy since the fifteenth century and analysis of continuing literacy problems in developed and developing countries.

#### **LTWR 141. The Process of Writing (4)**

A study of writing as a creative process. Review of research on creativity and on the writing process and analysis of writers' introspective accounts of their work. Delineation of the stages in writing process and exploration of implications for learning to write.

#### **LTWR 142. Forms of Written Discourse (4)**

A review of current rhetorical theory and discourse theory. Some attention to recent developments in text linguistics. Students will write several discourse types and explore differences among the types, with special attention to differences for the writing process and for the structure of the written discourse itself.

#### **LTWR 143. Stylistics and Grammar (4)**

A close look at sentence-level features of written discourse—stylistics and sentence grammars. Students will review recent research on these topics and experiment in their own writing with various stylistic and syntactic options.

#### **LTWR 144. The Teaching of Writing (4)**

Wide reading in current theory and practice of teaching writing in schools and colleges. Careful attention to various models of classroom writing instruction and to different approaches in the individual conference. Students in this course may observe instruction in the UCSD college writing programs or tutor freshman students in those programs.

### **Directed Study and Special Study**

#### **LTWR 180. Senior Writing Workshop (4)**

A workshop in any genre to be offered for advanced students. May be repeated for credit when topics vary. *Prerequisite: consent of instructor.*

#### **LTWR 196. Honors Thesis (4)**

Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed LTGN 191. Oral exam.

#### **LTWR 198. Directed Group Study (4)**

Directed group study in areas of writing not normally covered in courses. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.* May be taken for credit three times.

#### **LTWR 199. Special Studies (2 or 4)**

Tutorial; individual guidance in areas of writing not normally covered in courses. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.* May be taken for credit three times.

### **LTWR 271. Theory and Practice of College Writing Instruction (4)**

In this course we will explore the implications for writing instruction of current discourse theory and of linguistics (sentence-level and text-level). We will also review research on writing instruction and look carefully at several models of classroom instruction and individual conferencing.

### **LTWR 272. Research on Composing and Written Discourse (4)**

This course will survey current research and carry out research studies. Emphasis will be placed on research which can contribute to a theoretical understanding of the writing process.

### **LTWR 273. Practicum on Research in Composing and Written Discourse (4)**

In this course students will design and carry out research studies. Emphasis will be placed on research which can contribute to a theoretical understanding of the writing process.

### **LTWR 280. Graduate Workshop in Imaginative Writing (4)**

This course will be a workshop where students will produce work every week to share with the class. Their work will be critiqued in class and in conference with the instructor. They will be expected to complete a substantial body of work, one which is publishable as is. Weekly reading assignments will be required, in order to provide a common basis for discussion of poetics, politics, and process. The purpose of the class is to give those graduate students in literature, who have written poetry and fiction already, a chance to develop their abilities in those genres. Repeatable for credit when material/instructors vary.

## THE MAKING OF THE MODERN WORLD

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OFFICE: Fifth College, Bldg. 412 Matthews Administrative and Academic Complex

The Making of the Modern World is a six-course sequence required of all Fifth College students. It is designed to encourage them to think historically, comparatively, and in an interdisciplinary manner about both Western and non-Western cultures, as well as learn about them. Disciplinary perspectives include literature, history, philosophy, anthropology, sociology, political science, and fine arts. Students will examine and interpret primary documents and artifacts from diverse eras and cultures, as well as learn about them from secondary sources. All six quarters of the sequence will include lectures, discussions, and writing assignments. Courses in the sequence may be taken for a letter grade only.

Students in the Making of the Modern World 2 and 3 (offered in winter and spring quarters respectively) receive intensive instruction in university-level writing. Subject matter for writing instruction is drawn from or related to course material. Instruction in writing is provided in small writing laboratory sessions which meet twice each week. Each of these two writing-intensive quarters carries six units of credit. Students must have satisfied the university's Subject A requirement in English composition before enrolling in the Making of the Modern World 2 or 3.

Students from colleges other than Fifth may enroll in the sequence if space is available after

the initial enrollment period. Such students should consult staff in the program office during the first week of classes regarding space availability.

For further details on Fifth College requirements, see "Fifth College, General-Education Requirements."

## Courses

### ■ TRADITIONS

#### 1. Prehistory and the Birth of Civilization (4)

The first in a six-quarter sequence constituting a comparative, interdisciplinary, and historical inquiry into "The Making of the Modern World." Students will be introduced to what is known about early humans, including the evolution of the human body and the reconstruction of Paleolithic and Neolithic cultures. Contemporary hunting-and-gathering and tribal societies will be examined to illuminate the complexity of such cultures with respect to mythology and oral tradition, interpersonal relations, and ecological practices. The course will conclude with an analysis of the emergence of large agrarian societies and the earliest great settled communities and civilizations. Three hours of lecture, one hour of discussion. Open to Fifth College students only. (Letter grade only.) (F)

#### 2. The Great Classical Traditions (6)

An introduction to four major classical civilizations of the ancient world, all of which have left legacies to the present. Equal attention will be given to Israel, Greece, India, and China. The course covers the great early systems of religious and social thought, using an approach which combines history and social sciences. This course includes intensive instruction in writing expository prose. Three hours of lecture, two hours of writing and discussion sections. *Prerequisite: satisfaction of the Subject A requirement.* Open to Fifth College students only. (Letter grade only.) (W)

#### 3. The Medieval Heritage (6)

A survey of the period from the early centuries of the Christian era to the sixteenth century. The following topics will be addressed: Christianity and the birth of Europe; India, Africa, and the rise and spread of Islam; Imperial China and Japan; early cross-cultural contacts (the Crusades and other encounters among Europeans and peoples of the Near and Far East, Africa, and the Americas). Emphasis will be on the dynamism of medieval societies in contrast to the image of static or "dark" ages. Care will be taken to recreate the popular history of these times: lives of common people, the rise of towns, growth of commerce, popular religion, magic and superstition, entertainments, etc. This course includes intensive instruction in university-level writing. Three hours of lecture, two hours of writing and discussion sections. *Prerequisite: satisfaction of the Subject A requirement.* Open to Fifth College students only. (Letter grade only.) (S)

### ■ TRANSFORMATIONS

#### 4. European Expansion and the Clash of Cultures (4)

An examination of the world from the sixteenth to the end of the eighteenth century. Topics will include the religious reformations in Europe and the fierce competition of the European powers for slaves, souls, and material wealth in Africa, America, and Asia. The course will examine the effects of European expansion on the formerly invincible Ottoman Turks and indigenous people of the "New World," as well as the challenge this expansion posed to China and Japan. Attention will be given throughout to views concerning human relations, nature, and

the state that transformed both the European and non-European worlds. The course will conclude with a review of conflicting forces in Europe during the period of the Old Regime and the first phase of world-wide colonial empire. Three hours of lecture, one hour of discussion. *Prerequisite: satisfaction of the Subject A requirement.* Open to Fifth College students only. (Letter grade only.) (F)

#### 5. Revolution, Industry, and Empire (4)

A consideration of the great changes in European society from the late seventeenth century to the Russian Revolution and their impact on the non-Western world. Topics will include the absolutist state and the Enlightenment, the French and American revolutions, industrialization, the rise of nationalism and the nation-state, mass politics, Western imperialism, and the colonial experience. Developments in non-Western countries during this period will be examined from their own internal perspective. Three hours of lecture, one hour of discussion. *Prerequisite: satisfaction of the Subject A requirement.* Open to Fifth College students only. (Letter grade only.) (W)

#### 6. Our Century and After (4)

Beginning with World War I and the Russian Revolution, a study of developments that set our century apart. The expansion of state power and conflicts between democratic and anti-democratic forces will be examined, along with the social and cultural implications of these developments. Changes in the international system (the end of European hegemony, the rise of the superpowers, decolonialization, international economic instability, etc.) and in the character of warfare (particularly the development of nuclear weapons) also will be explored. Finally, the notions of world culture and world system will be addressed. Three hours of lecture, one hour of discussion. *Prerequisite: satisfaction of the Subject A requirement.* Open to Fifth College students only. (Letter grade only.) (S)

## MATERIALS SCIENCE

OFFICE: 4207 Engineering Building 1, Warren College

### Professors

Siavouche Nemat-Nasser, Ph.D., *AMES, Program Coordinator*

Gustaf Arrhenius, Ph.D., *SIO*

Robert J. Asaro, Ph.D., *AMES*

Ami Berkowitz, Ph.D., *Physics*

Robert Dynes, Ph.D., *Physics*

Yuan-Cheng Fung, Ph.D., *Emeritus, AMES*

David Gough, Ph.D., *AMES*

Gilbert G. Hegemier, Ph.D., *AMES*

S.S. Lau, Ph.D., *ECE*

Huey-Lin Luo, Ph.D., *ECE*

M. Brian Maple, Ph.D., *Physics*

Xanthippi Markenscoff, Ph.D., *AMES*

Marc A. Meyers, Ph.D., *AMES*

Stanley Middleman, Ph.D., *AMES*

David R. Miller, Ph.D., *AMES*

Johann K. Oesterreicher, Ph.D., *Chemistry*

Constantin Politis, Ph.D., *Adjunct/ECE*

M. Lea Rudee, Ph.D., *Dean, Division of Engineering, ECE*

Geert W. Schmid-Schoenbein, Ph.D., *AMES*

Ivan K. Schuller, Ph.D., *Physics*

Massoud Simnad, Ph.D., *Adjunct/AMES*

Richard Skalak, Ph.D., *AMES*

Frank E. Talke, Ph.D., *AMES*

T. Don Tilley, Ph.D., *Chemistry*

Charles W. Tu, Ph.D., *ECE*

Harry H. Wieder, D.Sc., *ECE*

### Associate Professors

Richard K. Herz, Ph.D., *AMES*

Hidenori Murakami, Ph.D., *AMES*

J. Talbot, Ph.D., *AMES*

### Assistant Professors

Atul Chokshi, Ph.D., *AMES*

John E. Crowell, Ph.D., *Chemistry*

Frances Hellman, Ph.D., *Physics*

Karen L. Kavanagh, Ph.D., *ECE*

John B. Kosmatka, Ph.D., *AMES*

Joanna McKittrick, Ph.D., *AMES*

Michael J. Sailor, Ph.D., *Chemistry*

Kenneth S. Vecchio, Ph.D., *AMES*

Materials science is concerned with the study of the structure and properties of materials. The Materials Science Program at UCSD aims to provide fundamental knowledge for quantitative understanding of materials with the objective of predicting, modifying, and tailoring the properties of materials to yield, at the technology level, enhanced material performance. The foundations of materials science are the basic sciences of physics, chemistry, and mathematics. The great variety of materials response, at the optical, magnetic, electrical, mechanical, and chemical levels, requires a solid scientific foundation and breadth of basic knowledge from the materials scientists. The interdisciplinary nature of the program at UCSD is ideally suited to address this requirement. The graduate Materials Science Program benefits from unique research facilities existing at UCSD. These include the resources in the Department of AMES, ECE, Physics, Chemistry, and SIO, as well as in the Center of Excellence for Advanced Materials and the Center for Magnetic Recording Research. Of particular emphasis within the program is the experimental investigation and theoretical modelling of the mechanical response and failure models of advanced materials at ultrahigh strain rates as well as electronic, superconducting, magnetic, and optical properties of materials for advanced applications.

## THE GRADUATE PROGRAM

The Materials Science Program is interdisciplinary, with participation of faculty members from several departments. The governance of the program is carried out by the executive committee of the program. The executive committee co-

ordinates all affairs of the Materials Science Program, including student admissions, degree requirements, graduate courses in materials science given by various participating departments, maintenance of laboratory instructional facilities, seminars, special courses, part-time instructors, and related matters. Faculty from the following departments participate in the graduate Materials Science Program: the Departments of Applied Mechanics and Engineering Sciences (AMES), Physics, Scripps Institution of Oceanography (SIO), Electrical and Computer Engineering (ECE), and Chemistry.

Undergraduate preparation for the materials science M.S. and Ph.D. normally would include a degree in engineering or physical sciences, such as physics, chemistry, geology, and related disciplines. It is expected that interested students would have the adequate mathematics, physics, chemistry and related basic sciences background.

## MASTER'S DEGREE PROGRAM

The program offers the M.S. degree in materials science under both the Thesis Plan I and the Comprehensive Examination Plan II; see "Graduate Studies: Master's Degree." The requirements for the M.S. degree are as follows:

1. All students must complete a total of thirty-six units.
2. All students must complete a core of the following five courses:  
(1) Physics 152 or MS 227; (2) MS 201A; (3) MS 201B; (4) MS 201C; (5) MS 205A.  
See "Courses" for descriptions.
3. Students may include up to twelve units of undergraduate courses. These include the one undergraduate core course, Physics 152.
4. Remaining courses to complete the thirty-six unit requirement for the M.S. degree may be selected from an approved list of graduate courses with the consent of a faculty adviser.
5. Students either complete a thesis (Plan I) or pass a comprehensive examination (Plan II) as described in the "Graduate Studies" section of this catalog.
6. Students must meet all other requirements established by the university.

In the case of students who transfer with some graduate credit or an M.S. from another institution, their records will be reviewed by a faculty adviser, and an appropriate individual course of study will be approved by the executive committee.

## THE PH.D. PROGRAM

After completing the M.S. degree or meeting equivalent requirements and meeting the minimum standard on the comprehensive examination to be admitted to the Ph.D. program, a student must:

1. Meet all the university's residency and other requirements.
2. Successfully complete three advanced graduate courses (in addition to those required for the M.S. degree) approved by the student's potential dissertation adviser.
3. Present a Research Seminar. This seminar requirement must be completed before scheduling the Ph.D. Qualifying Examination (Senate Exam).
4. Pass an oral examination (Ph.D. Qualifying Examination) to be advanced to candidacy.
5. Successfully complete and defend a dissertation which in the opinion of the dissertation committee contains original work that should lead to publication of at least one significant article in an appropriate refereed journal.

In principle, it should be possible to finish the M.S. degree in three quarters, and a Ph.D. in an additional three years. Ph.D. time limits are as follows: Pre-candidacy—four years; Support limit—six years; Total time limit—seven years; Normative time limit for a properly prepared B.S. student—five years. (See "Graduate Studies—Ph.D. Time Limits" for further explanation.)

## Courses

### GRADUATE

#### 200. Graduate Seminar (0)

Each graduate student in the Materials Science Program is expected to attend a weekly seminar in materials science or related areas. (S/U grades only.) (F,W,S)

#### 201A. Thermodynamics of Solids (4)

The thermodynamics and statistical mechanics of solids. Basic concepts; equilibrium properties of alloy systems; thermodynamic information from phase diagrams, surfaces, and interfaces; crystalline defects. *Prerequisite: consent of instructor.*

#### 201B. Solid State Diffusion and Reaction Kinetics (4)

Thermally activated processes, Boltzmann factor, homogeneous and heterogeneous reactions, solid state diffusion, Fick's laws, diffusion mechanisms, Kirkendall effect, Boltzmann-Matano analysis, high diffusivity paths. *Prerequisite: consent of instructor.*

#### 201C. Phase Transformations (4)

Classification of phase transformations: displacive and reconstructive transformations: classical and nonclassical theories of nucleation: Becker-Doering, Volmer-Weber, lattice instabilities, spinodal decomposition. Growth theories: interface migration, stress effects, terrace-ledge mechanisms, epitaxial growth, kinetics, and mechanics. Precipitation. Order-disorder transformations. Solidification. Amorphization. *Prerequisite: consent of instructor.*

#### 205A. Imperfections in Solids (4)

Point, line, and planar defects in crystalline solids, including vacancies, self-interstitials, solute atoms, dislocations, stacking faults, and grain boundaries; effects of imperfections on mechanical, electrical, and chemical properties; interactions of dislocations with point defects; hardening by localized obstacles, and precipitation and dispersion hardened alloys. *Prerequisite: consent of instructor.*

#### 205B. Advanced Study of Defects in Solids (4)

Advanced topics in dislocation theory and dislocation dynamics. Defects and defects interactions. Atomistic and sub-atomistic effects. Physical models based on microscopic considerations. *Prerequisite: MS 205A or consent of instructor.*

#### 206. Mathematical Theory of Dislocations (4)

Dislocations in crystals. The stress field of an isolated dislocation in isotropic and anisotropic elastic materials. Theory of continuously distributed dislocations. Interaction between a dislocation and other defects. Moving dislocations and dislocation dynamics. Dislocation cores. Application of dislocation theory to plasticity of solids, to fracture mechanics, and to dynamic failure processes. *Prerequisite: MS 205A or consent of instructor.*

#### 207. Surface Reactions, Corrosion, and Oxidation (4)

The nature of surfaces; nucleation and growth of surface films. Techniques for studies of surface structures and of surface films. Types of corrosion phenomena and mechanisms of corrosion. Methods of corrosion control and prevention. Mechanisms of oxidation. Control of oxidation by alloying and surface coatings. *Prerequisite: MS 201A or consent of instructor.*

#### 211A. Mechanical Properties (4)

Review of basic concepts in mechanics of deformation; elasticity, plasticity, viscoelasticity, and creep; effects of temperature and strain-rate on inelastic flow; microstructure and mechanical properties; application of basic concepts to selected advanced materials. *Prerequisite: consent of instructor.*

#### 211B. Advanced Mechanical Behavior (4)

Rate mechanisms in crystalline solids. Kinetics and dynamics of plastic flow by slip at low and high strain rates. Mechanisms of inelasticity in nonmetals, metals, and polymeric materials. Mechanisms of failure and effects of strain rates. *Prerequisite: MS 211A or consent of instructor.*

#### 212A. Fracture and Failure of Solids (4)

The engineering and scientific aspects of crack nucleation, slow crack growth, and unstable fracture in crystalline and amorphous solids. Dislocation models of cracks. Fatigue and fracture in reactive environments. Dynamic fracturing at high and ultrahigh loading rates. Alloy development and fracture safe design. *Prerequisite: MS 211A or consent of instructor.*

#### 212B. Thermomechanical Properties of Composite Materials (4)

Relationship between structure and thermomechanical properties of composite materials with fiber and particulate reinforcements. Properties of fibers, matrices, and interfaces. Fracture and failure modes under static and dynamic loads. *Prerequisite: MS 212A or consent of instructor.*

#### 213A. Dynamic Behavior of Materials, I (4)

Elastic waves in continuum; longitudinal and shear waves. Surface waves. Plastic waves; shock waves; Rankine-Hugoniot relations. Method of characteristics, differential and difference form of conservation equations; dynamic plasticity and dynamic fracture. Shock wave reflection and interaction. *Prerequisite: consent of instructor. (F)*

#### 213B. Dynamic Behavior of Materials, II (4)

Shock induced phase transformations and reactions. Wave propagation through distended materials. Impact; Mie-Grun-eisen and other equations of state, the Gurney equation. Detonation theory. Dislocation behavior at high strain rates. Shear



instabilities. Spalling and fragmentation. *Prerequisite: consent of instructor. (W)*

**217. Nondestructive Testing and Failure Analysis (4)**  
Survey of nondestructive testing methods and their applications. Analysis of failures of engineering structures and components, with examples of different types of reported failures of materials. *Prerequisite: consent of instructor.*

**221. Electronic Materials and Processes (4)**  
Fermi statistics, occupation of bulk impurity levels; electron transport and electron-phonon interactions; quantum effects in transport phenomenon; physics and chemistry of surfaces and interfaces. *Prerequisite: consent of instructor.*

**225. Materials for Magnetic Recording (4)**  
Magnetic properties of small particles and thin films. Origin of magnetic anisotropy. Switching behavior. Magnetopics. Effect of surfaces on magnetic properties. *Prerequisite: MS 221 or consent of instructor.*

**227. Physics and Chemistry of Materials (4)**  
The atomic and molecular structure of metals, ceramics, and semiconductors; materials properties as a function of the type of the chemical bond and the arrangement of the atoms in the structure. Symmetry operations, crystal symmetry, crystal structures, chemical bonds, orbital structure, band theory, and tensor properties: magnetic and electrical susceptibility, stress, piezoelectricity, elasticity. *Prerequisite: consent of instructor.*

**228. Magnetism, Superconductivity, and the Chemical Bond (4)**  
Molecules and solids. Localized, collective, and superconducting electrons. Types of magnetic order and moment interactions. Jahn Teller ordering vs. spin orbit ordering. Ionic compounds, ionic compounds with metallic conductivity, metallic compounds. Illustrative examples. Bands, magneto-optic effects. *Prerequisite: consent of instructor.*

**233A-B. Processing and Synthesis of Advanced Materials (4-4)**  
Background information on conventional techniques: forging, rolling, drawing, casting. Rapid solidification processing of metals and ceramics. Production of composites. Directionally solidified eutectics. Combustion synthesis. Sol-gel synthesis of ceramics. Mechanical alloying. Shockwave synthesis and processing. Thin film techniques. Laser glazing. Electron beam mixing. Molecular beam epitaxy. Superplastic processing. *Prerequisite: consent of instructor.*

**236. Ceramic and Glass Technology (4)**  
Powder synthesis, powder compaction and densification via different processing routes. Phase equilibria and crystallography in ceramic materials. Sintering, liquid and vapor phase processing and single crystal growth. Control of the microstructural development and interfacial properties to optimize properties for structural, thermal, electrical, or magnetic use. Topics in processing and use of advanced ceramic materials. Glass formation and structure, phase separation, viscous flow and relaxation. *Prerequisite: consent of instructor.*

**240A. Scanning Electron Microscopy (4)**  
Electron optics, electron-beam-specimen interactions. Image formation in the SEM. The role of specimen and detector in contrast formation. Imaging strategies. X-ray spectral measurements. Qualitative and quantitative X-ray microanalysis. Materials specimen preparation. *Prerequisite: consent of instructor.*

**240B. Transmission Electron Microscopy (4)**  
Operation and calibration of the TEM, lens defects and resolution, formation of images and diffraction patterns, electron diffraction theory (kinematic dynamical), indexing diffraction patterns, the fine structure in diffraction patterns, diffraction contrast. Quantitative analysis of crystal defects, phase contrast, and specimen preparation. *Prerequisite: MS 240A or consent of instructor.*

**240C. Analytical Electron Microscopy (4)**  
Concepts of AEM and AEM capabilities, alignment in the AEM. Imaging modes in the AEM (TEM and STEM). Quantitative X-ray microanalysis. Limits of microanalysis. Electron energy loss spectroscopy (EELS). Microdiffraction. Convergent beam electron diffraction (CBED), and high-resolution transmission electron microscopy (HRTEM). *Prerequisite: MS 240B or consent of instructor.*

**290. Topics in Materials Science (4)**  
A course to be given at the discretion of the faculty on topics of current interest in materials science.

**296. Independent Study (4)**  
*Prerequisite: consent of instructor.*

**298. Directed Group Study (1-4)**  
Directed group study on a topic or in a field not included in the regular materials science curriculum by special arrangement with a faculty member. *Prerequisite: consent of instructor. (S/U grades permitted.)*

**299. Graduate Research (1-12)**  
(S/U grades only.)

Subject to the approval of a faculty adviser, students may also choose from the following courses offered by departments participating in the Materials Science Program (see the relevant pages of this catalog for descriptions):

■ **APPLIED MECHANICS AND ENGINEERING SCIENCES (AMES)**

**AMES 231A. Foundations of Solid Mechanics (4)**

**AMES 231B. Elasticity (4)**

**AMES 231C. Anelasticity (4)**

**AMES 233A. Mechanics of Composite Materials (4)**

**AMES 233B. Micromechanics (4)**

**AMES 233C. Fracture Mechanics (4)**

**AMES 234. Experimental Mechanics (4)**

**AMES 238. Stress Waves in Solids (4)**

**AMES 261. Thermodynamics (4)**

**AMES 256. Rheology of Fluids (4)**

**AMES 257A. Polymer Processing (4)**

**AMES 257B. Polymerization Reactor Design (4)**

■ **ELECTRICAL AND COMPUTER ENGINEERING (ECE)**

**ECE 220A. Solid State Electronics (4)**

**ECE 220B. Solid State Electronics (4)**

**ECE 220C. Solid State Electronics (4)**

**ECE 221. Thin Film Phenomena (4)**

**ECE 224. Introduction to VLSI Microfabrication Technology (4)**

**ECE 233. Structure of Solids (4)**

**ECE 267. Modern Materials Analysis (4)**

■ **PHYSICS**

**Phys. 211. Solid State Physics (5)**

▼ **MATHEMATICS**

OFFICE: 7018 Applied Physics and Mathematics Building, Muir College

**Professors**

- Jim Agler, Ph.D.
- Donald W. Anderson, Ph.D., *Dean, Division of Natural Sciences*
- Randolph E. Bank, Ph.D.
- M. Salah Baouendi, Ph.D.
- Edward A. Bender, Ph.D.
- James R. Bunch, Ph.D.
- Thomas J. Enright, Ph.D.
- John W. Evans, M.D., Ph.D.
- Ronald J. Evans, Ph.D.
- Jay P. Fillmore, Ph.D.
- Carl H. FitzGerald, Ph.D.
- Patrick J. Fitzsimmons, Ph.D.
- Theodore T. Frankel, Ph.D., *Emeritus*
- Michael L. Fredman, Ph.D.
- Michael H. Freedman, Ph.D.
- Adriano M. Garsia, Ph.D.
- Ronald K. Getoor, Ph.D.
- Philip E. Gill, Ph.D.
- Leonard R. Haff, Ph.D.
- Hubert Halkin, Ph.D.
- Richard S. Hamilton, Ph.D.
- J. William Helton, Ph.D.
- James P. Lin, Ph.D.
- Alfred B. Manaster, Ph.D.
- John O'Quigley, Ph.D.
- Jeffrey B. Remmel, Ph.D.
- Yosef Rinott, Ph.D.
- Burton Rodin, Ph.D.
- Helmut Rohrl, Ph.D.
- Murray Rosenblatt, Ph.D.
- Linda Rothschild, Ph.D.
- Michael J. Sharpe, Ph.D.
- Lance W. Small, Ph.D.
- Donald R. Smith, Ph.D., *Vice-Chair*
- Harold M. Stark, Ph.D., *Chair*
- Audrey A. Terras, Ph.D.
- Adrian R. Wadsworth, Ph.D.
- Nolan R. Wallach, Ph.D.
- Ruth J. Williams, Ph.D.
- Stanley G. Williamson, Ph.D.
- Daniel E. Wulbert, Ph.D.

**Associate Professors**

- Ian S. Abramson, Ph.D.
- Samuel R. Buss, Ph.D.
- Jeffrey M. Rabin, Ph.D.
- Norman A. Shenk, Ph.D.
- John Wavrik, Ph.D.
- Hans G. Wenzl, Ph.D.

**Senior Lecturers in Mathematics**

- Patrick J. Ledden, Ph.D., *Provost, Muir College*
- Frank B. Thiess, Ph.D., *Emeritus*



## MATHEMATICS

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### Assistant Professors

Bruce K. Driver, Ph.D.  
Mark Haiman, Ph.D.  
Kevin Walker, Ph.D.

The Department of Mathematics offers a wide range of courses and programs. These vary in their objectives and levels of required mathematical maturity. In certain courses, the cultural aspects of mathematics are emphasized, and the prerequisites are minimal. In others, the scientific and technical aspects are paramount, and the prerequisites are considerable. In making selections, students are advised to keep in mind their particular objectives and backgrounds.

## THE UNDERGRADUATE PROGRAM

### 348 FIRST-YEAR COURSES

During orientation, each freshman is given an examination to determine that student's level of mathematics preparation for the department's calculus courses. Before orientation, students should briefly review their mathematics so that their test performance accurately reflects their competence. The examination results will be used to assist the student in selecting a starting point in the mathematics program. Some students will be required to take precalculus courses before beginning a calculus sequence.

A course in college algebra is offered on the UCSD campus by a community college in cooperation with the department. This course is designed both for students who need a preparatory course before beginning the Mathematics 1 sequence and for students who plan to enroll in the Mathematics 2 sequence but need to strengthen their algebraic skills and facility in graphing and working with exponential and logarithmic functions before enrolling in Mathematics 4C. Mathematics 4C is the department's preparatory course for the Mathematics 2 sequence, providing a brief review of the material in the college algebra course followed by an introduction to trigonometry and a more advanced treatment of graphing and functions.

Mathematics 1A-B-C is one of two calculus sequences. The students in this course have completed a minimum of two years of high school mathematics. This course is acceptable for majors in liberal arts, economics, and some of the majors in biology. It fulfills the mathematics requirements of Revelle College and the option of the general-education requirements of Muir College. Completion of two quarters fulfills the requirement of Third College and the option of Warren College and Fifth College.

The other first-year calculus sequence, Mathematics 2A (or 2AH), 2B (or 2BP or 2BH), and 2C (or 2CP or 2CH), is taken mainly by students who have completed four years of high school mathematics or have taken a college level precalculus course such as Mathematics 4C. This sequence fulfills all college level requirements met by Mathematics 1A-1B-1C and is required of many majors, including biochemistry, cell biology, molecular biology, mathematics, chemistry, AMES, CSE, ECE, and physics. Students with adequate backgrounds in mathematics are strongly encouraged to take Mathematics 2 since Mathematics 1 is inadequate preparation for many later courses in science and economics.

Students who are considering becoming mathematics majors (including applied mathematics, scientific programming, or mathematics-computer science majors) and others with particular interest in mathematics should arrange their schedules so they can take the honors calculus classes, Mathematics 2AH through Mathematics 2FH, instead of Mathematics 2A through Mathematics 2F whenever possible. These honors classes may be substituted for the corresponding nonhonors classes for all UCSD requirements, except that Mathematics 2DH may not be substituted for Mathematics 2DA in the AMES major. With this exception, any combination of honors and nonhonors calculus classes may be taken.

Students who have received credit for Math. 2A by advanced placement or other examinations, or by taking equivalent courses at other institutions other than UCSD, should take Math. 2BP instead of Math. 2B in the fall and Math. 2CP instead of 2C in the winter. Those who have received credit for Math. 2A and 2B by advanced placement, examinations, or transfer credit should take Math. 2CP instead of Math. 2C in the fall.

Certain transfers between the Mathematics 1 and Mathematics 2 sequences are possible, but such transfers should be carefully discussed with an adviser. Able students who begin the Mathematics 1 sequence and who wish to transfer to the Mathematics 2 sequence, may follow one of three paths, the first of which is highly recommended over the others:

1. Follow Math. 1A with Math. 2A, with two units of credit given for Math. 2A. This option is not available if the student has credit for Math. 1B or Math. 1C. This option is available only if the student obtains a grade of A in Math. 1A.
2. Follow Math. 1B with Math. 2B, receiving two units of credit for Math. 2B.
3. Follow Math. 1C with Math. 2B, receiving two units of credit for Math. 2B and two units of credit for Math. 2C.

Credit will not be given for courses taken simultaneously from the Mathematics 1 and the Mathematics 2 sequence.

## MAJOR PROGRAMS

The department offers four different majors: (1) mathematics, (2) applied mathematics, (3) applied mathematics (scientific programming), and (4) mathematics-computer science. The specific emphases and course requirements for these majors are described in the following sections. All majors must obtain a minimum 2.0 grade-point average in the upper-division courses used to satisfy the major requirements. Further, the student must receive a grade of C — or better in any course to be counted toward fulfillment of the major requirements. Any mathematics course numbered 100-194 may be used as an upper-division elective with the exception of 183. (Note: 195, 198, and 199 cannot be used towards a major.) All courses used to fulfill the major must be taken for a letter grade.

## SECONDARY SCHOOL MATHEMATICS TEACHING

A mathematics major offers excellent preparation for teaching math in the secondary schools. If you are interested in earning a California teaching credential from UCSD, contact the Teacher Education Program for information about the prerequisites and professional preparation requirements. It is recommended that you contact TEP as early as possible in your academic career.

## MAJOR IN MATHEMATICS

The upper-division curriculum provides programs for mathematics majors as well as courses for students who will use mathematics as a tool in the physical and behavioral sciences and the humanities. Foreign languages recommended for mathematics majors are French, German, and Russian. See also requirements for all major programs.

All students majoring in mathematics must complete the basic sequence 2A (or 2AH), 2B (2BP or 2BH), 2C (2CP or 2CH), 2DA (or 2DH), 2EA (or 2EH), 2F (or 2FH) and, in so doing, should take as many of the honors classes (2AH-2FH) as they can work into their schedules. Mathematics 89 should be taken in the spring quarter of the sophomore year, but may be taken in the fall, concurrently with Mathematics 140A, 100A, or 103A. In addition to these lower-division courses, math. majors must complete at least twelve one-quarter, upper-division courses including:

1. 140A-B
2. 100A-B or 103A-B
3. Two complete sequences from the following list: 100A-B-C, 103A-B-102, 104A-B-C, 110-120A-B, 111A-B, 110-130A-B, 110-132A-B, 140A-B-C, 150A-B-C, 160A-B, 170A-B-C, 171A-B, 180A-B-C, 180A-181A-B, 141-190-191.

As with all departmental requirements, more advanced courses on the same material may be substituted with written approval from the departmental adviser.

To be prepared for a strong major curriculum, students should complete Mathematics 2DA(or 2DH), 2EA(or 2EH), 2F(or 2FH), and Mathematics 89 before the end of their sophomore year. Either Mathematics 140A-B or 100A-B (103A-B) should be taken during the junior year.

### MAJOR IN APPLIED MATHEMATICS

A major in applied mathematics is also offered. The program is intended for students planning to work on the interface between mathematics and other fields. Students considering this major should obtain the department's list of requirements on applied mathematics. See also requirements for all major programs.

All students majoring in applied mathematics are required to complete the following courses:

1. Calculus: 2A(or 2AH), 2B(2BP or 2BH), 2C(2CP or 2CH), 2DA(or 2DH), 2EA(or 2EH), and 2F(or 2FH) with as many honors classes taken in place of the regular classes as possible. (Math. 89 is recommended but not required.)
2. Programming:  
Fortran (AMES 10) or (CSE 75)  
Pascal (CSE 62AB or CSE 65)
3. Linear Algebra: Math. 102 and 170A.
4. Statistics: 183 or 181A. Note: Math. 183 cannot be used toward the 52 required upper-division units.
5. Advanced Calculus: Math. 142AB (or 140AB).
6. One of the following sequences: 180A-B-C (probability), 180A-181A-B (probability and statistics), or any three courses from 170A-B-C, 172, and 173 (numerical analysis).
7. One additional sequence which may be chosen from the list (#6) above or the following list: 110-120A-130A, 111A-B, 120A-B, 130A-132A, 155A-B, 171A-B, 184A-B.

At least fifty-two upper-division units must be completed in mathematics, except:

- a. Up to twelve units may be outside the department in an approved applied mathematical area. A petition approved by an applied math. adviser

is required. No such units may also be used for a minor or program of concentration.

- b. AMES 154, Econ. 120A-B-C, Math. 183, 195, and 199 cannot be counted toward the fifty-two units.

To be prepared for a strong major curriculum, students should complete Mathematics 2DA(or 2DH), 2EA(or 2EH) before the end of their sophomore year. 102 and 142A-B should be taken during the junior year.

### MAJOR IN APPLIED MATHEMATICS (SCIENTIFIC PROGRAMMING)

This is a specialized applied mathematics program with a concentration in scientific programming, i.e., computer solution of scientific problems. The requirements are those of the applied mathematics major, except for the following additions and substitutions:

1. Physics 1A-B-C, 2A-B-C, or 3A-B-C
2. Instead of (#6) and (#7) in the applied mathematics major, the following sequences are required:  
(#6) any three from 170A-B-C, 172, 173  
(#7) 171A-B

### MAJOR IN MATHEMATICS—COMPUTER SCIENCE

The program provides for a major in computer science within the Department of Mathematics. Graduates of this program will be mathematically oriented computer scientists who have specialized in the mathematical aspects and foundations of computer science or in the computer applications of mathematics.

The curriculum for the B.A. in mathematics-computer science requires thirty-six units of lower-division courses and sixty units of upper-division courses. Of these sixty units, fifty-six units are required courses and four units are elective courses. A 3.0 average in the courses in item #1 is required for admission to the major. See requirements for all major programs.

The detailed curriculum is given in the following list.

#### Required Courses:

1. 2A(or 2AH), 2B(2BP or 2BH), 2C(2CP or 2CH), 2DA(or 2DH), 2EA(or 2EH), and 2F(or 2FH) with as many honors classes taken in place of the regular classes as possible.
2. 89 or 79B
3. One of 79A, CSE 65, CSE 62A-B, CSE 75
4. 79B or CSE 70
5. 103A-B (100A-B may be substituted)

6. 184A
7. 176A and 186A
8. 166A
9. 180A
10. 188
11. One of the two areas of concentration:
  - I. Numerical Computing
    - a) 170A
    - b) Three one-quarter courses chosen from: 170B, 170C, 172, 173
    - c) Two additional one-quarter courses from: 102, 110, 111A-B-C, 171A-B, 130A-B, 131, 132A-B, 140A-B, 142A-B, 180 B-C, 181A-B, 185
    - d) One mathematics-related elective
  - II. Non-Numerical Computing
    - a) Two from 174, 170A-B-C, 172, 173
    - b) 189A-B
    - c) Two from: 140A-B, 142A-B, 176B, 186B, 179A-B, 155A-B, 184B, 166B, 168A-B, 187, 189C, 160A-B, CSE 170A-B, CSE 171A-B, CSE 173
    - d) One mathematics-related elective

In order to graduate by the end of their senior year, students must complete Mathematics 103A, 103B, 166A, 176A and 186A by the end of their junior year.

### MINOR IN MATHEMATICS

The minor in mathematics (for all colleges) consists of a total of six or more courses, taken from the UCSD mathematics department, of which at least three are upper-division courses. Acceptable lower-division courses are Mathematics 2DA (or 2DH), 2EA (or 2EH), 2F (or 2FH), 79A, 79B, and Mathematics 89. At least two of the upper-division courses must be from a single sequence as described for the mathematics, applied mathematics, or mathematics-computer science major. As with the mathematics major, Mathematics 183 and 195 are not considered upper-division courses for the mathematics minor.

For a class to count toward the minor, a grade of C — or better (or P if the Pass/Not Pass option is used) is obligatory. There is no restriction on the number of classes taken with the P/NP option.

### DUPLICATION OF CREDIT

In the circumstances listed below, a student will not receive full credit for a Department of Mathematics course. The notation "Math. 2A [2 if Math. 1A previously/0 if Math. 1A concurrently/0 if Math. 1B or 1C]" means that a student already having credit for Mathematics 1A will receive only two units of credit for Mathematics 2A, but will receive no units if he or she has

credit for Mathematics 1B or 1C, and no credit will be awarded for Mathematics 2A if Mathematics 1A is being taken concurrently. Math. 4C cannot be taken for credit after Math. 1 or Math. 2.

1. Math. 2A [2 if Math. 1A previously/0 if Math. 1A concurrently/0 if Math. 1B or 1C]
2. Math. 2B [2 if Math. 1B or 1C previously/0 if Math. 1B concurrently]
3. Math. 2C [2 if Math. 1C previously/0 if Math. 1C concurrently]
4. Math. 103A-B [0 if Math. 100A-B], Math. 142A-B [0 if Math. 140A-B]
5. Math. 155A [0 if CSE 177], Math. 171A-B [0 if Math. 172A-B]
6. Math. 180A [2 if Econ. 120A or Math. 183 previously/0 if Econ. 120A or Math. 183 concurrently]
7. Math. 181A [2 if Econ. 120B/0 if Econ. 120B concurrently]

Credit will be given for only one from each of the following sets of courses, and either course in a set may be used to replace a D or F in the other course: Mathematics 2A and 2AH; Mathematics 2B, 2BH, and 2BP; Mathematics 2C, 2CH, and 2CP; 2DA and 2DH; 2EA and 2EH; Mathematics 2F and 2FH.

**ADVISERS**

Advisers change yearly. Contact the undergraduate office at (619) 534-3590 for the current list.

**THE GRADUATE PROGRAM**

The department offers graduate programs leading to the M.A., M.S., and Ph.D. degrees.

Admission to the graduate program is in accordance with the general requirements of the graduate division of the University of California. Students with a bachelor's degree and background in mathematics comparable to the requirements for the undergraduate major in mathematics at this university may apply for admission. Applicants must present satisfactory scores on the Graduate Record Examination, including the advanced examination in mathematics.

In each quarter, a student's program must include at least twelve units. At least eight of these units must be in graduate mathematics courses; in addition, these eight units must be taken for a letter grade unless the student has advanced to Ph.D. candidacy. The remaining four units must be in upper-division or graduate courses in mathematics-related subjects or in Mathematics 501. Mathematics 500, Apprentice Teaching, may not be used to satisfy any part of this require-

ment. Mathematics 299, Reading and Research, may only be used by students in the Ph.D. program who have passed both written qualifying examinations (see "Doctoral Degree Program") or who have obtained the approval of the graduate adviser.

**MASTER'S DEGREE PROGRAM**

Requirements for the master of arts degree are to be met according to Plan II, Comprehensive Examination, as defined by the university. A total of forty-eight units of course credit is required as follows:

1. At least twenty-four units of graduate mathematics courses.
2. Not more than nine units of upper-division mathematics courses.
3. Not more than twelve units of graduate courses in a related field approved by the department.
4. Not more than four units of Mathematics 500, Apprentice Teaching, or Math. 295. No units of Mathematics 299 may be used in satisfying the requirements for the master's degree. Mathematics 500 may not be used under item 1. Mathematics 501 may be used under item 2.

The comprehensive examination will cover basic facts in two topics, one from each group:

1. Algebra or applied algebra or topology.
2. Real analysis or complex analysis.

The examinations are typically given at the end of June and in mid-September. A detailed list of the depth requirements in each of these areas, with literature references and approved courses, is available in the office of the Department of Mathematics.

A reading knowledge of one foreign language—French, German, or Russian—is required. (In exceptional cases other languages may be substituted.) The foreign language examinations, which consist of the translation of selected passages in mathematics, are administered by the department.

Full-time M.A. students are permitted seven quarters in which to complete all requirements.

**MASTER'S DEGREE PROGRAM IN APPLIED MATHEMATICS**

The Department of Mathematics also offers an M.A. program in applied mathematics for regular or part-time students. The program requires one to two years for completion. A total of forty-eight units of course credit is required. These must include at least thirty-two units of graduate work, of which at least twenty-four must be graduate

courses in mathematics. The remaining required units may be composed of:

1. Approved graduate courses in other departments.
2. No more than eight units of upper-division mathematics courses or Mathematics 501.
3. No more than eight units of approved upper-division courses in other departments.
4. No more than four units of Mathematics 500 (which cannot be used to satisfy graduate course unit requirements).

No units of Mathematics 299 or 295 may be used to satisfy the M.A. requirements. There is no foreign language requirement, and a thesis is not required.

Students must take two sequences and pass two qualifying exams (at the M.A. level) from the following applied mathematics courses: 202A-B-C, 210A-B-C, 261A-B-C, 264A-B-C, 270A-B-C, 271A-B-C, 272A-B-C, 277A-B-C. In certain cases one substitution may be made from the supplementary list: 220A-B-C, 230A-B-C, 240A-B-C, 280A-B-C, 281A-B-C, 282A-B-C. (Not every course is offered each year.) The dates for the qualifying exams for this program vary. Consult with the instructors of the relevant courses.

In addition, students are encouraged to take a one-year graduate sequence in a related area outside the Department of Mathematics (e.g., computer science, engineering, physics, economics). Full-time M.A. students are permitted seven quarters in which to complete all requirements.

**MASTER'S DEGREE PROGRAM IN STATISTICS**

The program leading to the M.S. in statistics at UCSD was designed on the premise that students need strong mathematical backgrounds plus exposure to statistical computing and serious applications. Courses are offered in mathematics and applied statistics and in probability and stochastic processes. The curriculum includes multivariate analysis, nonparametric statistics, time series, sequential analysis, and numerical analysis. Some courses entail computing on a VAX 11/780. Students in the M.S. program are encouraged to broaden their horizons by studying material in other disciplines.

Mathematics 281A-B, 282A-B, and two of the topics given in 287A-B-C-D and 289A-B-C are required. For the applied orientation 270A-B-C is suggested, while 280A-B-C is required for a theoretical emphasis. Students are encouraged to take other departments' courses which apply statistical and probabilistic concepts.

A total of forty-eight units of course credit is required. A maximum of twenty-four of these

units may come from approved graduate courses outside the Department of Mathematics. At most, eight units as a combined total may come from the following: Mathematics 500 and undergraduate upper-division courses in applied mathematics approved by departmental advisers.

Each student must pass, at the master's level, two written comprehensive examinations offered by the Department of Mathematics and approved by departmental advisers as related to the student's studies in statistics. The dates for the comprehensive exams for this program vary. Consult with the instructors of the relevant courses. There is no foreign language requirement, and a thesis is not required. Full-time M.S. students are permitted seven quarters in which to complete all requirements.

## DOCTORAL DEGREE PROGRAM

A student acquires a general background in mathematics by preparing for and taking written departmental qualifying examinations in two topics, one from each group:

1. Algebra or applied algebra or topology.
2. Real analysis or complex analysis.

One of the two areas must be real analysis or complex analysis; another must be algebra or applied algebra or topology. There is a third requirement which depends on the student's area of study; see the faculty adviser. The examinations are typically given at the end of June and in mid-September. A detailed list of depth requirements in each area, with literature references and approved courses, is available in the office of the Department of Mathematics. No exam may be taken more than twice, and no more than four attempts are allowed to pass the examinations in the two areas.

Students in the Ph.D. program are required to pass (at the Ph.D. level) one of these two qualifying examinations by the September following their first year of study. The second exam must be passed (at the Ph.D. level) before the beginning of their third year of study. Students in the Ph.D. program who do not meet this schedule will be transferred to an M.A. program in mathematics. They do have the opportunity, however, to retake the exams at a future date, find a thesis adviser, and submit a written request to transfer back into the Ph.D. program. No exam may be taken more than twice, and no more than four attempts are allowed to pass the examinations in the two areas.

Students originally admitted to a master's program who later wish to transfer to the Ph.D. program will be evaluated in comparison to the current year applicant pool. Previous passage of

qualifying exams at the Ph.D. level is not sufficient for admission to the Ph.D. program.

A student must demonstrate a satisfactory reading knowledge of two foreign languages (chosen from French, German, and Russian; in exceptional circumstances other languages may be substituted.) After a student has met the area and language requirements and has decided upon a field of research under the supervision of a faculty member, a doctoral committee appointed by the Office of Graduate Studies and Research conducts the student's oral qualifying examination. This examination deals primarily with the proposed area of thesis research and may include the project itself. A student must pass this examination by the end of his or her eleventh quarter. Successful completion of this requirement advances the student to candidacy. The student then concentrates on courses and research related to completion of a doctoral dissertation. After completion of the research and dissertation, the student takes a final oral examination on the dissertation.

## TIME LIMIT POLICIES

Students must be advanced to candidacy by the end of eleven quarters in order to continue receiving financial support, and twelve quarters in order to remain in the Ph.D. program. Total university support cannot exceed six years. Total registered time as a UCSD graduate student cannot exceed seven years.

## Courses

All prerequisites listed below may be replaced by an equivalent or higher-level course. The listings of quarters in which courses will be offered are only tentative. Please consult the Department of Mathematics to determine the actual course offerings each year.

### LOWER DIVISION

**1A. Elements of Mathematical Analysis (4)**  
Differentiation and integration of algebraic functions. Fundamental theorem of calculus. Applications. Three lectures, two recitations. (Credit not given if Math. 2A previously completed.) Three lectures, two recitations. *Prerequisites: passing score on placement examination and either two or more units of high school mathematics or equivalent. One-half unit of trigonometry is desirable.* (F,W,S)

**1B. Elements of Mathematical Analysis (4)**  
Further applications of the definite integral. Calculus of trigonometric, logarithmic, and exponential functions. Complex numbers. (Credit not given if Math. 2B previously completed.) Three lectures, two recitations. *Prerequisite: Math. 1A.* (F,W,S)

**1C. Elements of Mathematical Analysis (4)**  
Vector geometry, velocity and acceleration vectors. Partial derivatives, multiple integrals. Exact differentials. (Credit not

given if Math. 2C previously completed.) Three lectures, two recitations. *Prerequisite: Math. 1B.* (F,W,S)

**2A. Calculus and Analytic Geometry (4)**  
Differential and integral calculus of functions of one variable: limits, continuity; differentiation of algebraic and trigonometric functions; applications. Definite integral, primitive functions, fundamental theorem of the calculus. Elements of analytic geometry as needed in the development of the calculus. Three lectures, two recitations. *Prerequisites: passing score on placement examination and either three or more units of high school mathematics or Math. 4C. With a superior performance in Math. 4C no placement examination is required; one-half unit of trigonometry is desirable.* (F,W,S)

**2AH. Honors Calculus (4)**  
This course covers the material in Math. 2A, with somewhat less emphasis on drill and more on theory. It may be used in place of Math. 2A for all UCSD requirements. Recommended for all prospective mathematics majors and others with particular interest in mathematics. Three lectures, two recitation sections. *Prerequisites: the same as for Math. 2A.* (F)

**2B. Calculus and Analytic Geometry (4)**  
Applications of the definite integral, calculus of logarithmic, exponential, and hyperbolic functions. Methods of integration. Separable differential equations. Conic sections. In fall quarters all students who have received credit for Math. 2A by advanced placement or other examinations or by taking equivalent courses at institutions other than UCSD should take Math. 2BP (Calculus for AP Students), instead of Math. 2B. Three lectures, one recitation. *Prerequisite: Math. 2A or 2AH.* (F,W,S)

**2BH. Honors Calculus (4)**  
This course covers the material in Math. 2B, with somewhat less emphasis on drill and more on theory. It may be used in place of Math. 2B for all UCSD requirements. Recommended for all prospective mathematics majors and others with particular interest in mathematics. Three lectures, two recitation sections. *Prerequisites: Math. 2A or 2AH.* (F,W)

**2BP. Calculus for AP Students (4)**  
This course covers the topics in Math. 2B with somewhat more challenging problems. Intended for all students who have received credit for Math. 2A by advanced placement or other examinations or by taking equivalent courses at institutions other than UCSD. Three lectures, one recitation. *Prerequisite: Math. 2A, Math. 2AH, or advanced placement.* (F)

**2C. Calculus and Analytic Geometry (4)**  
Vector geometry, vector functions and their derivatives. Partial differentiation. Maxima and minima. Double and triple integrals. All students who have received credit for Math. 2A or Math. 2B by advanced placement or other examinations or by taking equivalent courses at institutions other than UCSD should take Math. 2CP (Calculus for AP Students), instead of Math. 2C. Three lectures, one recitation. *Prerequisite: Math. 2B, 2BP, or 2BH.* (F,W,S)

**2CH. Honors Calculus (4)**  
This course covers the material in Math. 2C, with somewhat less emphasis on drill and more on theory. It may be used in place of Math. 2C for all UCSD requirements. Recommended for all prospective math. majors and others with particular interest in mathematics. Three lectures, two recitation sections. *Prerequisites: Math. 2B, 2BP, or 2BH.* (F,W,S)

**2CP. Calculus for AP Students (4)**  
This course covers the topics in Math. 2C with somewhat more challenging problems. Intended for all students who have received credit for Math. 2A or Math. 2B by advanced placement or other examinations or by taking equivalent courses at institutions other than UCSD. Three lectures, one recitation. *Prerequisite: Math. 2B, 2BP, or Math. 2BH, or advanced placement.* (F,W)



**2DA. Introduction to Differential Equations (4)**

Infinite series. Ordinary differential equations: exact, separable, and linear; constant coefficients, variation of parameters, initial value problems. Series solutions: ordinary points, method of Frobenius. Higher order linear equations: systems, Laplace transforms. Techniques for engineering sciences. Three lectures, two recitations. *Prerequisite: Math. 2C, 2CP, or 2CH.* (F,W,S)

**2DH. Honors Differential Equations (4)**

This course covers the material in Math. 2DA, with somewhat less emphasis on drill and more on theory and infinite series. (Check with your major department to determine whether Math. 2DH fulfills your major requirements.) Recommended for all prospective math. majors and others with particular interest in mathematics. Three lectures, two recitation sections. *Prerequisites: Math. 2EA (2EH), or 2C, 2CP, or 2CH and consent of instructor.* (F,W,S)

**2EA. Introduction to Linear Algebra (4)**

Matrix operations, solutions to  $m$  linear algebraic equations in  $n$  unknowns, linear vector spaces, determinants, matrix eigenvalue problems, multiple eigenvalues, orthonormalization and expansions in orthonormal bases, orthogonal matrices, quadratic and positive-definite forms, simultaneous diagonalization, variational and iterative methods. Applications are directed towards the physical and engineering sciences. Three lectures, two recitations. *Prerequisite: Math. 2C, 2CP, or 2CH.* (F,W,S)

**2EH. Honors Linear Algebra (4)**

This course covers the material in Math. 2EA, with somewhat less emphasis on drill and more on theory. It may be used in place of Math. 2EA for all UCSD requirements. Recommended for all prospective math. majors and others with particular interest in mathematics. Three lectures, two recitation sections. *Prerequisites: Math. 2C, 2CP, or 2CH.* (F,W,S)

**2F. Calculus of Functions of Several Variables (4)**

Calculus of vector functions with use of linear algebra. Matrix formulation of the chain rule and the second derivative test for critical points of a function of several variables. Jacobian determinants and change of variables in a multiple integral. Vector fields, line and surface integrals. Stokes' theorem and the divergence theorem. Selected applications. Three lectures, one recitation. *Prerequisites: Math. 2DA (or 2DH) and Math. 2EA (or 2EH).* (F,W,S)

**2FH. Honors Multivariable Calculus (4)**

This course covers the material in Math. 2F, with somewhat less emphasis on drill and more on theory. (Check with your major department to determine whether Math. 2FH fulfills your major requirements.) Recommended for all prospective mathematics majors and others with particular interest in mathematics. Three lectures, two recitation sections. *Prerequisites: Math. 2DH or Math 2DA and Math. 2EA/2EH.* (F,W)

**4C. Elementary Functions (4)**

Review of polynomials. Graphing functions and relations: graphing rational functions, effects of linear changes of coordinates. Circular functions and right triangle trigonometry. Reinforcement of function concept: exponential, logarithmic, and trigonometric functions. Vectors. Conic sections. Polar coordinates. Three lectures, one recitation. *Prerequisite: qualifying score on placement examination. With a superior performance in the community college algebra course offered on the UCSD campus, the placement examination requirement may be waived. (Cannot be taken for credit after Math. 1 or Math. 2)* (F,W,S)

**6A-B. Introductory Statistics and Mathematical Analysis (4-4)**

Descriptive statistics, measures of location and variability, organization of multivariate data, basic probability, random sampling, Central Limit Theorem. Sampling distributions, confidence intervals, hypothesis testing, single population problems, comparisons between two populations. Credit not of-

fered for both Math. 6A and Social Science 60 or Psychology 60. Three lectures and one recitation section. *Prerequisite: intermediate or college algebra.*

**74. Scientific Application of Computers (4)**

Introduction to elementary numerical analysis with emphasis on computer applications. Systems of linear equations, interpolation, extrapolation, polynomial fits to data, root finding, numerical differentiation, and integration. Three lectures, one recitation. (Credit not offered for both Math. 74 and CSE 64.) *Prerequisites: Math. 2B and CSE 61 or 65 or equivalent course emphasizing structured programming approved by the instructor.*

**79A-B. Structure of Programs (4-4)**

This is an honor sequence for mathematically sophisticated students. Building abstractions with procedures and data. Iteration, recursion, hierarchical data, generic operators. Modularity, objects and state metalinguistic abstraction. Lambda calculus and functional programming. Three lectures, one recitation. *Prerequisites: Math. 2C, 2CP, or 2CH and a 3.5 average in two courses in the UCSD Math. 2 sequence or consent of instructor.*

**89. Proseminar (4)**

A course emphasizing the analysis and writing of proofs and other mathematical expositions, with topics chosen from calculus, linear algebra, set theory, and finite mathematics. Required of all pure mathematics and mathematics/computer science majors and recommended for applied mathematics and scientific programming majors. Three lectures and one recitation section. *Prerequisites: Math. 2EA or 2EH.* (F,S)

UPPER DIVISION

**100A-B-C. Modern Algebra (4-4-4)**

An introduction to the methods and basic structures of higher algebra: sets and mappings, the integers, rational, real and complex numbers, groups, rings (especially polynomial rings) and ideals, fields, real and complex vector spaces, linear transformations, inner product spaces, matrices, triangular form, diagonalization. Both 100 and 103 cannot be taken for credit. Three lectures, one recitation. *Prerequisites: Math. 2EA or 2EH and Math. 89 (may be taken concurrently).* (F,W,S)

**102. Applied Linear Algebra (4)**

A second course in linear algebra from a computational yet geometric point of view. Elementary Hermitian matrices, Schur's theorem, normal matrices, and quadratic forms. Moore-Pinrose generalized inverse and least square problems. Vector and matrix norms. Characteristic and singular values. Canonical forms. Determinants and multilinear algebra. Three lectures, one recitation. *Prerequisite: Math. 2EA or 2EH.* (S)

**103A-B. Modern Applied Algebra (4-4)**

Abstract algebra with applications to computation. Set algebra and graph theory. Finite state machines. Boolean algebras and switching theory. Lattices. Groups, rings and fields: applications to coding theory. Recurrent sequences. Three lectures, one recitation. Both 100 and 103 cannot be taken for credit. *Prerequisite: Math. 2EA or 2EH and Math. 89 (may be taken concurrently).* (F,W)

**104A-B-C. Number Theory (4-4-4)**

Topics from number theory with applications and computing. Possible topics are: congruences, reciprocity laws, quadratic forms, prime number theorem, Riemann zeta function, Fermat's conjecture, diophantine equations, Gaussian sums, algebraic integers, unique factorization into prime ideals in algebraic number fields, class number, units, splitting of prime ideals in extensions, quadratic and cyclotomic fields, partitions. Possible applications are Fast Fourier Transform, signal processing, coding, cryptography. Three lectures. *Prerequisite: consent of instructor.*

**107A-B. Computer Algebra (4)**

An introduction to algebraic computation. Computational aspects of groups, rings, fields, etc. Data representation and algorithms for symbolic computation. Polynomials and their arithmetic. The use of a computer algebra system as an experimental tool in mathematics. Programming using algebra systems. *Prerequisite: prior or concurrent enrollment in the Math. 100 or 103 sequence.*

**108. Problem Solving (4)**

Development of topics in algebra, geometry, probability, combinatorics, number theory, etc., as needed for solving nonroutine problems. May be repeated for credit. Three lectures. *Prerequisite: GPA better than 3.5 in Math. 2A-2E or consent of instructor.* (Not offered in 1991-92.)

**110. Introduction to Partial Differential Equations (4)**

Fourier series, orthogonal expansions, and eigenvalue problems. Sturm-Liouville theory. Some partial differential equations of mathematical physics. Boundary value problems and separation of variables. Three lectures, one recitation. *Prerequisites: Math. 2DA (or 2DH) and 2EA (or 2EH) or consent of instructor.* (F,W,S)

**111A. Mathematical Model Building (4)**

Analytic techniques and simulation methods will be used to study a variety of models. Students will work on independent projects. Three lectures. *Prerequisites: Math. 2DA (or 2DH) and 2EA (or 2EH).* (Not offered in 1991-92.)

**111B. Mathematical Model Building (4)**

Analytic techniques and simulation methods will be used to study a variety of models. Students will work on independent projects. Three lectures. *Prerequisites: Math. 2DA or 2DH and programming ability (any course).* (Not offered in 1991-92.)

**111C. Mathematical Model Building (4)**

Analytic techniques and simulation methods will be used to study a variety of models. Students will work on independent projects. Three lectures. *Prerequisite: Math. 111A or 111B.* (Not offered in 1991-92.)

**120A. Elements of Complex Analysis (4)**

Complex numbers and functions. Analytic functions, harmonic functions, elementary conformal mappings. Complex integration. Power series. Cauchy's theorem. Cauchy's formula. Residue theorem. Three lectures, one recitation. *Prerequisite or co-registration: Math. 2F or 2FH.* (F,W)

**120B. Applied Complex Analysis (4)**

Applications of the Residue theorem. Conformal mapping and applications to potential theory, flows, and temperature distributions. Fourier transformations. Laplace transformations, and applications to integral and differential equations. Selected topics such as Poisson's formula. Dirichlet problem. Neumann's problem, or special functions. Three lectures, one recitation. *Prerequisite: Math. 120A.* (W,S)

**130A. Ordinary Differential Equations (4)**

Linear and nonlinear systems of differential equations. Stability theory, perturbation theory. Applications and introduction to numerical solutions. Three lectures. *Prerequisites: Math. 2DA (or 2DH) and 2EA (or 2EH).* (F)

**130B. Ordinary Differential Equations (4)**

Existence and uniqueness of solutions to differential equations. Local and global theorems of continuity and differentiability. Three lectures. *Prerequisites: Math. 2DA (or 2DH) and 2EA (or 2EH), and Math. 130A.* (W)

**131. Variational Methods in Optimization (4)**

Maximum-minimum problems. Normed vector spaces, functionals, Gateaux variations. Euler-Lagrange multiplier theorem for an extremum with constraints. Calculus of variations via the multiplier theorem. Applications may be taken from a variety of areas such as the following: applied mechanics, elasticity, economics, production planning and resource allocation, astronau-



tics, rocket control, physics, Fermat's principle and Hamilton's principle, geometry, geodesic curves, control theory, elementary bang-bang problems. Three lectures, one recitation. *Prerequisites: Math. 2DA (or 2DH) and 2EA (or 2EH) or consent of instructor.* (S)

**132A. Elements of Partial Differential Equations and Integral Equations (4)**

Basic concepts and classification of partial differential equations. First order equations, characteristics. Hamilton-Jacobi theory; Laplace's equation, wave equation, heat equation. Separation of variables, eigenfunction expansions, existence and uniqueness of solutions. Three lectures. *Prerequisite: Math. 110 or consent of instructor.* (W)

**132B. Elements of Partial Differential Equations and Integral Equations (4)**

Relation between differential and integral equations, some classical integral equations, Volterra integral equations, integral equations of the second kind, degenerate kernels, Fredholm alternative, Neumann-Liouville series, the resolvent kernel. Three lectures. *Prerequisite: Math. 132A.* (S)

**140A-B-C. Foundations of Analysis (4-4-4)**

Axioms, the real number system, topology of the real line, metric spaces, continuous functions, sequences of functions, differentiation, Riemann-Stieltjes integration, partial differentiation, multiple integration, Jacobians. Additional topics at the discretion of the instructor: power series, Fourier series, successive approximations of other infinite processes. Three lectures, one recitation. *Prerequisites: Math. 2F or 2FH and Math. 89 (may be taken concurrently).* Credit cannot be obtained for both Math. 140A-B and 142A-B. (F,W,S)

**141. Introduction to Abstract Analysis (4)**

General topological spaces, compactness, separation, locally compact Hausdorff spaces, metrization, completeness, Baire category, Stone-Weierstrass theorem, function spaces. Three lectures. *Prerequisites: Math. 140A-B or equivalent.* (F)

**142A-B Advanced Calculus (4-4)**

The number system. Functions, sequences, and limits. Continuity and differentiability. The Riemann integral. Transcendental functions. Limits and continuity. Infinite series. Sequences and series of functions. Uniform convergence. Taylor series. Improper integrals. Gamma and Beta functions. Fourier series. Three lectures. *Prerequisite: Math. 2F or 2FH.* Credit cannot be obtained for both Math. 140A-B and 142A-B.

**150A. Differential Geometry (4)**

Differential geometry of curves and surfaces. Gauss and mean curvatures, geodesics, parallel displacement, Gauss-Bonnet theorem. Three lectures. *Prerequisites: Math. 2F or 2FH or consent of instructor.* (F)

**150B-C. Calculus on Manifolds (4-4)**

Calculus of functions of several variables, inverse function theorem. Further topics, selected by instructor, such as exterior differential forms, Stokes' theorem, manifolds, Sard's theorem, elements of differential topology, singularities of maps, catastrophes, further topics in differential geometry, topics in geometry of physics. Three lectures. *Prerequisite: Math. 150A.* (W)

**151. Topics in Geometry (4)**

A topic, selected by the instructor, from Euclidean geometry, non-Euclidean geometry, projective geometry, algebraic geometry, or other geometries. May be repeated for credit with a different topic. Three lectures. *Prerequisite: consent of instructor.* (S)

**155A. Computer Graphics (4)**

Overview of computer graphics. Drawing and transformations of points and lines, clipping and windowing, display files, plane curves, three-dimensional graphics, hidden surfaces. Introduction to graphics packages and interactive graphics. Three lectures, one recitation, and approximately eight laboratory hours per week. *Prerequisites: Math. 2EA or 2EH and programming*

*experience.* [Warning: There are duplicate credit restrictions on this course. See section on Duplication of Credit.] (F)

**155B. Topics in Computer Graphics (4)**

Special mathematical topics relevant to computer graphics. Topics may include three-dimensional transformations and projections, surface description and generation, hidden lines and surfaces, among others. Three lectures, one recitation, and approximately eight laboratory hours per week. *Prerequisite: Math. 155A or consent of instructor.* (W)

**160A-B-C. Elementary Mathematical Logic (4-4-4)**

An introduction to recursion theory, set theory, proof theory, and model theory. Turing machines. Undecidability of arithmetic and predicate logic. Proof by induction and definition by recursion. Cardinal and ordinal numbers. Completeness and compactness theorems for propositional and predicate calculi. Three lectures. *Prerequisite: Math. 100A, 103A, 140A, or consent of instructor.*

**163. History of Mathematics (4)**

The course will be taught from the original sources in translation, starting from Babylonian times to 1800 A.D. The unifying themes will be the histories of algebra and analysis. Half of the lecture will be actual mathematics of the times. Three lectures, one recitation. *Prerequisite: Math. 1C, 2B, 2BP, 2BH, or consent of instructor.* (S)

**165. Introduction to Set Theory (4)**

Sets, relations, and function. Partial, linear, and well-orders. The Axiom of Choice, proof by induction, and definition by recursion. Cardinal and ordinal numbers and their arithmetic. *Prerequisite: Math. 100A or 140A or 103A, or consent of instructor.* (S)

**166A-B. Theory of Computability (4-4)**

An introduction to the mathematical theory of computability, including formal treatment. Finite automata and regular expressions. Context-free languages and push-down automata. Turing machines and recursive functions. Church's thesis. Unsolvable problems. Further topics selected from computational complexity, arithmetical relations, word problems. Three lectures, one recitation. *Prerequisite: Math. 103A or 100A or consent of instructor.* (F,S)

**168A-B. Topics in Applied Mathematics-Computer Science (4-4)**

Topics to be chosen in areas of applied mathematics and mathematical aspects of computer science. May be repeated once for credit with different topics. Three lectures, one recitation. *Prerequisite: consent of instructor.* (W,S)

**170A. Numerical Linear Algebra (4)**

Analysis of numerical methods for linear algebraic systems and least squares problems. Orthogonalization methods. Illconditioned problems. Eigenvalue and singular value computations. Three lectures, one recitation. *Prerequisites: Math. 2EA or 2EH and knowledge of programming.* (F,S)

**170B. Numerical Analysis (4)**

Rounding and discretization errors. Calculation of roots of polynomials and nonlinear equations. Interpolation. Approximation of functions. Three lectures, one recitation. *Prerequisites: Math. 2EA or 2EH and knowledge of programming.* (W)

**170C. Numerical Ordinary Differential Equations (4)**

Numerical integration. Ordinary differential equations and their numerical solution. Basic existence and stability theory. Difference equations, numerical methods, and error propagation. Boundary value problems. Three lectures, one recitation. *Prerequisites: Math. 2DA (or 2DH) and 2EA (or 2EH) and knowledge of programming.* (S)

**171A-B. Mathematical Programming—Numerical Optimization (4-4)**

Mathematical optimization and applications. Linear programming, the simplex method, duality. Nonlinear programming,

Kuhn-Tucker theorem. Selected topics from integer programming, network flows, transportation problems, inventory problems, and other applications. Three lectures, one recitation. (Credit not offered for both Math. 171A-B and Econ. 172A-B.) *Prerequisites: Math. 102 or 170A and knowledge of programming.* (W,S)

**172. Numerical Partial Differential Equations (4)**

Finite difference methods for the numerical solution of hyperbolic and parabolic partial differential equations; finite difference and finite element methods for elliptic partial differential equations. Three lectures. *Prerequisites: Math. 170A or Math. 110 and programming experience.* (S)

**173. Mathematical Software—Scientific Programming (4)**

Development of high quality mathematical software for the computer solution of mathematical problems. Three lectures, one recitation. *Prerequisites: Math. 170A or Math. 174 and knowledge of FORTRAN.* (W)

**174. Numerical Methods in Science and Engineering (4)**

Floating point arithmetic, linear equations, interpolation, integration, ordinary differential equations, nonlinear equations, optimization, least squares. Three lectures and one recitation. Students may not receive credit for both Math. 174 and Physics 105 or AMES 153 or 154. Students may not receive credit for Math. 174 if Math. 170 A,B, or C has been taken already. *Prerequisites: Math. 2EA (or 2EH) and knowledge of FORTRAN.* (F)

**176A-B. Computer Implementations of Data Structures (4-4)**

Introduction to the use of data structures in computer implementation of combinatorial algorithms. This course is designed to give students hands-on experience with these fundamental tools of computer science. Part A covers dictionaries, heaps, priority queues, hashing structures, balanced and self-adjusting trees. Part B includes selected applications to sorting, searching, string processing, elementary parsing, geometric and graph algorithms. Three lectures. *Prerequisites: Math. 2F or 2FH, Math. 100A or 103A (may be taken concurrently), Math. 79B or CSE 70.*

**179A-B. Introduction to Artificial Intelligence (4-4)**

A general introduction to the basic ideas, techniques, and problems of artificial intelligence, including knowledge of representation, search methods, pattern matching, goal reduction, production systems, and control strategies. The logical foundation for automated reasoning and program verification will be provided. The programming languages Lisp and Prolog will also be introduced and used for course work. Three lectures. *Prerequisite: Math. 176A or CSE 161A.* (W,S)

**180A. Introduction to Probability (4)**

Probability spaces, random variables, independence, conditional probability, distribution, expectation, joint distributions, central-limit theorem. Three lectures. *Prerequisites: Math. 2DA or 2DH.* [Warning: There are duplicate credit restrictions on this course. See section on Duplication of Credit.] (F)

**180B. Introduction to Probability (4)**

Random vectors, multivariate densities, covariance matrix, multivariate normal distribution. Random walk, Poisson process. Other topics if time permits. Three lectures. *Prerequisites: Math. 180A and Math. 2F or 2FH.* (W)

**180C. Introduction to Probability (4)**

Markov chains in discrete and continuous time, random walk, recurrent events. If time permits, topics chosen from stationary normal processes, branching processes, queuing theory. Three lectures. *Prerequisite: Math. 180B.* (S)

**181A. Introduction to Mathematical Statistics (4)**

Random samples, linear regression, least squares, testing hypotheses, and estimation. Neyman-Pearson lemma, likelihood

ratios. Three lectures, one recitation. *Prerequisites: Math. 180A and 2EA or 2EH.* [Warning: There are duplicate credit restrictions on this course. See section on Duplication of Credit.] (W)

**181B. Introduction to Mathematical Statistics (4)**  
Goodness of fit, special small sample distribution and use, nonparametric methods. Komogorov-Smirnov statistics, sequential analysis. Three lectures. *Prerequisite: 181A.* (S)

**182. Introduction to Combinatorics (4)**  
Combinatorial methods and their computer implementation. Permutations and combinations, generating functions, partitions, principle of inclusion and exclusion. Polya's theory of counting. Hall's theorem, assignment problem, backtrack technique, error-correcting codes, combinatorial optimization problems. Three lectures, one recitation. *Prerequisites: Math. 2EA or 2EH and programming experience.* (W)

**183. Statistical Methods (4)**  
Introduction to probability. Discrete and continuous random variables—binomial, Poisson and Gaussian distributions. Central limit theorem. Data analysis and inferential statistics: graphical techniques, confidence intervals, hypothesis tests, curve fitting. This course is recommended for students in science and engineering. Three lectures, one recitation. This course may not be used to satisfy upper-division course requirement for any mathematics major. (Credit not offered for both Math. 183 and Econ. 120A.) *Prerequisite: Math. 2C, 2CP, or 2CH.* (F,S)

**184A-B. Mathematical Foundations of Computer Science (4-4)**  
Enumeration of combinatorial structures. Ranking and unranking. Graph theory with applications and algorithms. Recursive algorithms. Circuit design. Inclusion-exclusion. Generating functions. Polya theory. Three lectures, one recitation. *Prerequisite: Math. 100B or Math. 103B.* (F,W)

**185. Introduction to Computational Statistics (4)**  
Statistical analysis of data by means of package programs. Regression, analysis of variance, discriminant analysis, and analysis of categorical data. Emphasis will be on understanding the connections among statistical theory, numerical results, and analysis of real data. Three lectures. *Prerequisite: Math. 181B or equivalent.*

**186A-B. Principles of Algorithm Implementation (4-4)**  
Methods and tools that make for effective program design developed through case studies of nonnumerical algorithms from sorting, searching, backtracking, and algorithmic graph theory. Includes top down and structured programming, data structures, run time analysis, program correctness, comparative studies of algorithm design. Three lectures. *Prerequisites: Math. 176A, 103A.* (F,W)

**187. Introduction to Cryptography (4)**  
An introduction to the basic concepts and techniques of modern cryptography. Classical cryptanalysis. Probabilistic models of plaintext. Monalphabetic and polyalphabetic substitution. The one-time system. Caesar-Vigenere-Playfair-Hill substitutions. The Enigma. Modern-day developments. The Data Encryption Standard. Public key systems. Security aspects of computer networks. Data protection. Electronic mail. Three lectures, one recitation. *Prerequisite: programming experience.* (S)

**188. Design and Analysis of Algorithms (4)**  
Design and analysis of algorithms, with emphasis on non-numerical algorithms. Paradigms and heuristics. Measuring complexity of algorithms, time, and storage. Three lectures. *Prerequisites: Math. 103B, 176A, 180A, 184A, and 186A.* (S)

**189A-B-C. Compilers (4-4-4)**  
Compilers for high-level programming languages. Project to develop a working compiler. Part A: regular expressions and finite automata, context free grammars, parsing techniques. Part B: syntax directed translation, semantic actions (for declarations, statement structures, assignments, array references, ex-

pression evaluation, procedure and function calls), symbol tables, run-time storage management. Part C: error recovery, optimization, code generation. Three lectures. *Prerequisites: Math. 166A, 176A, and 103A or consent of instructor.* (F,W,S)

**190. Introduction to Topology (4)**  
Topological spaces, subspaces, products, sums and quotient spaces. Compactness, connectedness, separation axioms. Selected further topics such as fundamental group, classification of surfaces, Morse theory, topological groups. May be repeated for credit once when topics vary, with consent of instructor. Three lectures. *Prerequisite: Math. 89 or consent of instructor.* (W)

**191. Topics in Topology (4)**  
Topics to be chosen by the instructor from the fields of differential algebraic, geometric, and general topology. Three lectures. *Prerequisite: Math. 190 or consent of instructor.* (S)

**195. Introduction to Teaching in Mathematics (4)**  
Students will be responsible for and teach a class section of a lower-division mathematics course. They will also attend a weekly meeting on teaching methods. (Does not count towards a minor or major.) Five lectures, one recitation. *Prerequisite: consent of instructor.* (F,W,S)

**198. Directed Group Studies in Mathematics (1 to 4)**  
Group study course in some topic not covered in the undergraduate curriculum. (P/NP grades only.) *Prerequisite: consent of instructor.* (F,W,S)

**199. Independent Study for Undergraduates (2 or 4)**  
Independent reading in advanced mathematics by individual students. Three periods. (P/NP grades only.) *Prerequisite: permission of department.* (F,W,S)

## GRADUATE

**200A-B-C. Algebra (4-4-4)**  
Group theory. Jordan-Holder theorem, Sylow theorems. Rings, polynomial rings, principal ideal domains, radicals, Wedderburn theorems, Hilbert Basis theorem. Modules, exact sequences, projective modules, tensor products. Fields, algebraic and transcendental extensions, algebraic closure, finite fields. Galois theory, fundamental theorem, solvability by radicals. *Prerequisites: Math. 100A-B-C or consent of instructor.* (F,W,S)

**201A-B-C. Basic Topics in Algebra (4-4-4)**  
Recommended for all students specializing in algebra. Basic topics include categorical algebra, commutative algebra, group representations, homological algebra, nonassociative algebra, ring theory. *Prerequisites: Math. 200A-B-C or consent of instructor.* (F,W,S)

**202A-B-C. Applied Algebra (4-4-4)**  
Selected topics in applied mathematics that are principally algebraic in nature, Boolean algebras, group codes, polynomial rings and polynomial codes, selected applications of finite fields, recurrent sequences, switching theory, finite state machines. *Prerequisites: Math. 103A-B or Math. 100A-B.* (F,W,S)

**203A-B-C. Algebraic Geometry (4-4-4)**  
Places, Hilbert Nullstellensatz, varieties, product of varieties: correspondences, normal varieties. Divisors and linear systems; Riemann-Roch theorem; resolution of singularities of curves. Grothendieck schemes; cohomology, Hilbert schemes; Picard schemes. *Prerequisites: Math. 200A-B-C.* (F,W,S)

**204A-B-C. Topics in Number Theory (4-4-4)**  
Topics in number theory, such as algebraic number theory, cyclotomic and Kummer extensions, class number, units, splitting of primes in extensions, zeta and L-functions, Tchebotarev density theorem, prime ideal theorem, Brauer-Siegel theorem, class field theory (abelian extensions, reciprocity laws), p-adic numbers, adeles, number theory of simple algebras, diophantine

equations and approximation, quadratic forms, Hasse-Minkowski theorem, Siegel theorem, automorphic forms, and applications such as Kronecker limit formula, Rademacher's result on the partition function. *Prerequisite: consent of instructor.* (F,W,S)

**207A-B-C. Topics in Algebra (4-4-4)**  
In recent years, topics have included number theory, commutative algebra, noncommutative rings, homological algebra, and Lie groups. May be repeated for credit with consent of adviser. *Prerequisite: consent of instructor.*

**208. Seminar in Algebra (1-4)**  
*Prerequisite: consent of instructor.* (S/U grades permitted.)

**209. Seminar in Number Theory (1 to 4)**  
*Prerequisite: consent of instructor.* (S/U grades permitted.)

**210A. Mathematical Methods in Physics and Engineering (4)**  
Vector spaces and linear transformations, eigenvalue problems, tensor algebra, matrices, norms, completeness, the spaces  $L_p$  and  $C$ , distributions, delta sequences. Properties of Lebesgue, Stieltjes, line integrals. Analytic functions. *Prerequisites: Math. 2D-E or 3D-E and 140A or advanced calculus.* (F)

**210B. Mathematical Methods in Physics and Engineering (4)**  
Scalar products, orthogonal series in Hilbert space, best approximation. Compact symmetric operators, expansions in eigenvectors. Applications to matrices, quadratic forms, integral equations. Regular and singular Sturm-Liouville problems. Green's functions. *Prerequisite: Math. 210A or consent of instructor.* (W)

**210C. Mathematical Methods in Physics and Engineering (4)**  
Fourier transforms of functions and distributions. Laplace transforms, applications to boundary value problems. Simple second order elliptic, hyperbolic, and parabolic partial differential equations. Uniqueness theorems, maximum principles. Spherical harmonics. Wave propagations. *Prerequisite: Math. 210B or consent of instructor.* (S)

**210D. Mathematical Methods in Physics and Engineering (4)**  
Elements of measure and integration theory, convergence theorems,  $L_p$ -spaces, Fubini theorem, Radon-Nikodym theorem. Applications to probability and elements of calculus of variations as time permits. *Prerequisites: Math. 210A and 210B or consent of instructor.* (S)

**215A-B-C. Mathematical Theory of Process Optimization (4-4-4)**  
Optimal control problems for systems described by nonlinear differential equations, necessary conditions, sufficient conditions; existence theorems, applications to classical calculus of variations and to problems in electrical and aerospace engineering. Optimal control problems for systems described by nonlinear difference equations, applications to the theory of optimal economic growth. *Prerequisites: Math. 241A-B-C or consent of instructor.* (F,W,S)

**217A-B-C. Topics in Applied Mathematics (4-4-4)**  
In recent years, topics have included applied complex analysis, special functions, and asymptotic methods. May be repeated for credit with consent of adviser. *Prerequisite: consent of instructor.*

**218. Seminar in Applied Mathematics (1 to 4)**  
*Prerequisite: consent of instructor.* (S/U grades permitted.)

**220A-B-C. Complex Analysis (4-4-4)**  
Complex numbers and functions. Cauchy theorem and its applications, calculus of residues, expansions of analytic functions, analytic continuation, conformal mapping and Riemann mapping theorem, harmonic functions. Dirichlet principle,

Riemann surfaces. *Prerequisites: Math. 140A-B or consent of instructor.* (F,W,S)

**221A-B-C. Topics in Several Complex Variables (4-4-4)**  
Formal and convergent power series, Weierstrass preparation theorem; Cartan-Ruckert theorem, analytic sets; mapping theorems; domains of holomorphy; proper holomorphic mappings; complex manifolds; modifications. *Prerequisites: Math. 200A and 220A-B-C or consent of instructor.*

**227A-B-C. Topics in Complex Analysis (4-4-4)**  
In recent years, topics have included conformal mapping, Riemann surfaces, value distribution theory, external length. May be repeated for credit with consent of adviser. *Prerequisite: consent of instructor.*

**228. Seminar in Complex Analysis (1 to 4)**  
*Prerequisite: consent of instructor.* (S/U grades permitted.)

**230A-B-C. Ordinary Differential Equations (4-4-4)**  
Existence and uniqueness theorems. Linear systems with constant and periodic coefficients. Sturm-Liouville theory. Eigenfunction expansions. Stability and asymptotic behavior of nonlinear systems. Poincare-Bendixon theorem. Perturbation theory. Linear systems in the complex domain and their singularities. Control theory. Equations in Banach space. *Prerequisites: Math. 130A-B and 220A-B or consent of instructor.*

**231A-B-C. Partial Differential Equations (4-4-4)**  
Existence and uniqueness theorems. Cauchy-Kowalewski theorem, first order systems. Hamilton-Jacobi theory, initial value problems for hyperbolic and parabolic systems, boundary value problems for elliptic systems. Green's function, eigenvalue problems, perturbation theory. *Prerequisites: Math. 210A-B or 240A-B-C or consent of instructor.*

**232A-B-C. Calculus of Variations (4-4-4)**  
Euler-Lagrange equation theory of fields, Hamilton-Jacobi theory, sufficient conditions, Weierstrass E test. Mayer, Lagrange and Boza problems. Optimal control, Pontryagin's maximum principle, existence theorems, sufficient conditions. Caratheodory's approach to calculus of variations. *Prerequisites: Math. 240A-B-C or Math. 210A-B-C.* (F,W,S)

**233. Singular Perturbation Theory for Differential Equations (4)**  
Multivariable techniques, matching techniques and averaging techniques, including various approaches to proofs of asymptotic correctness, for singular perturbation problems including initial value problems with nonuniformities at infinity, initial value problems with initial nonuniformities, two point boundary value problems, and problems for partial differential equations. Applications taken from celestial mechanics, oscillation problems, fluid dynamics, elasticity, and applied mechanics. *Prerequisites: Math. 130A-B or 132A-B or consent of instructor.* (S/U grades permitted.) (S)

**237A-B-C. Topics in Differential Equations (4-4-4)**  
May be repeated for credit with consent of adviser. *Prerequisite: consent of instructor.*

**238. Seminar in Differential Equations (1 to 4)**  
*Prerequisite: consent of instructor.* (S/U grades permitted.)

**240A-B-C. Real Analysis (4-4-4)**  
Lebesgue integral and Lebesgue measure, Fubini theorems, functions of bounded variations, Stieltjes integral, derivatives and indefinite integrals, the spaces L and C, equi-continuous families, continuous linear functionals general measures and integrations. *Prerequisites: Math. 140A-B-C.* (F,W,S)

**241A-B-C. Functional Analysis (4-4-4)**  
Metric spaces and contraction mapping theorem; closed graph theorem; uniform boundedness principle; Hahn-Banach theorem; representation of continuous linear functionals; conjugate space, weak topologies; extreme points; Krein-Milman theorem;

fixed-point theorems; Riesz convexity theorem; Banach algebras. *Prerequisites: Math. 240A-B-C or consent of instructor.*

**242. Topics in Fourier Analysis (4)**  
A course on Fourier analysis in Euclidean spaces, groups, symmetric spaces. *Prerequisites: Math. 240A-B-C or consent of instructor.* (F,W,S)

**247A-B-C. Topics in Real Analysis (4-4-4)**  
In recent years, topics have included Fourier analysis, distribution theory, martingale theory, operator theory. May be repeated for credit with consent of adviser. *Prerequisite: consent of instructor.*

**248. Seminar in Real Analysis (1 to 4)**  
*Prerequisite: consent of instructor.* (S/U grades permitted.)

**250A-B-C. Differential Geometry (4-4-4)**  
Differential manifolds, Sard theorem, tensor bundles, Lie derivatives, DeRham theorem, connections, geodesics, Riemannian metrics, curvature tensor and sectional curvature, completeness characteristic classes. Differential manifolds immersed in Euclidean space. *Prerequisite: consent of instructor.* (F,W,S)

**251A-B-C. Lie Groups (4-4-4)**  
Lie groups, Lie algebras, exponential map, subgroup subalgebra correspondence, adjoint group, universal enveloping algebra. Structure theory of semi-simple Lie groups, global decompositions, Weyl group. Geometry and analysis on symmetric spaces. *Prerequisites: Math. 200 and 250 or consent of instructor.* (F,W,S)

**256. Seminar in Lie Groups and Lie Algebras (2 to 4)**  
Various topics in Lie groups and Lie algebras, including structure theory, representation theory, and applications. *Prerequisite: consent of instructor.* (F,W,S)

**257A-B-C. Topics in Differential Geometry (4-4-4)**  
In recent years, topics have included Morse theory and general relativity. May be repeated for credit with consent of adviser. *Prerequisite: consent of instructor.*

**258. Seminar in Differential Geometry (1 to 4)**  
*Prerequisite: consent of instructor.* (S/U grades permitted.)

**259A-B-C. Geometrical Physics (4-4-4)**  
Manifolds, differential forms, homology, deRham's theorem. Riemannian geometry, harmonic forms. Lie groups and algebras, connections in bundles, homotopy sequence of a bundle, Chern classes. Applications selected from Hamiltonian and continuum mechanics, electromagnetism, thermodynamics, special and general relativity, Yang-Mills fields. *Prerequisite: graduate standing in mathematics, physics, or engineering or consent of instructor.*

**260A-B-C. Mathematical Logic (4-4-4)**  
Propositional calculus and quantification theory. Completeness theorem, theory of equality, compactness theorem, Skolem-Lowenheim theorems. Vaught's test: Craig's lemma. Elementary number theory and recursive function theory. Undecidability of true arithmetic and of Peano's axioms. Church's thesis; set theory; Zermelo-Frankel axiomatic formulation. Cardinal and ordinal numbers. The axiom of choice and the generalized continuum hypothesis. Incompleteness and undecidability of set theory. Relative consistency proofs. *Prerequisites: Math. 100A-B-C or consent of instructor.*

**261A-B-C. Combinatorial Algorithms (4-4-4)**  
Lexicographic order, backtracking, ranking algorithms, isomorph rejection, sorting, orderly algorithms, network flows and related topics, constructive Polya theory, inclusion-exclusion and sieving methods, Mobius inversion, generating functions, algorithmic graph theory, trees, recursion, depth firstsearch and applications, matroids. *Prerequisites: CSE 160A-B or Math. 184A-B or consent of instructor.* (F,W,S)

**262A-B-C. Topics in Combinatorial Mathematics (4-4-4)**  
Development of a topic in combinatorial mathematics starting from basic principles. Problems of enumeration, existence, construction, and optimization with regard to finite sets. Some familiarity with computer programming desirable but not required. *Prerequisites: Math. 100A-B-C.*

**263. History of Mathematics (4)**  
Mathematics in the nineteenth century from the original sources. Foundations of analysis and commutative algebra. For algebra the authors studied will be Lagrange, Ruffini, Gauss, Abel, Galois, Dirichlet, Kummer, Kronecker, Dedekind, Weber, M. Noether, Hilbert, Steinitz, Artin, E. Noether. For analysis they will be Cauchy, Fourier, Bolzano, Dirichlet, Riemann, Weierstrass, Heine, Cantor, Peano, Hilbert. *Prerequisites: Math. 100A-B, Math. 140A-B.* (S)

**264A-B-C. Combinatorics (4-4-4)**  
Topics from partially ordered sets, Mobius functions, simplicial complexes and shellability. Enumeration, formal power series and formal languages, generating functions, partitions. Lagrange inversion, exponential structures, combinatorial species. Finite operator methods, q-analogues, Polya theory, Ramsey theory. Representation theory of the symmetric group, symmetric functions and operations with Schur functions. (F,W,S)

**265A-B-C. Topics in Algorithmic Combinatorics (4-4-4)**  
Advanced topics in combinatorial algorithms and the application of combinatorial methods to computer science. Topics chosen from algorithmic methods in enumerative combinatorics, graph theory, group theory, matroid theory, coding theory, cryptography, and subjects in computer science that involve applications of these areas. May be repeated for credit with consent of adviser. Three lectures. *Prerequisites: Math. 261A-B or consent of instructor.* (F,W,S)

**267A-B-C. Topics in Mathematical Logic (4-4-4)**  
Topics chosen from recursion theory, model theory, and set theory. May be repeated with consent of adviser. *Prerequisite: consent of instructor.* (S/U grades permitted.)

**268. Seminar in Logic (1 to 4)**  
*Prerequisite: consent of instructor.* (S/U grades permitted.)

**269. Seminar in Combinatorics (1 to 4)**  
*Prerequisite: consent of instructor.* (S/U grades permitted.)

**270A-B-C. Numerical Mathematics (4-4-4)**  
Numerical solution of linear equations, least squares, and eigenvalue problems. Iterative methods for linear equations, solution of nonlinear equations, optimization. *Prerequisites: Math. 2EA or 2EH, and knowledge of FORTRAN.*

**271A-B-C. Complexity of Computational Algorithms (4-4-4)**  
Recent research on the analysis of the complexity of computational algorithms will be explored: high-precision multiplication, manipulation of graphs, matrix multiplication, inversion, linear equations, sparse matrices, polynomial evaluation, discrete Fourier transforms, algebraic manipulation, lower bounds of computations, polynomial complete problems. *Prerequisite: Math. 102 or Math. 100. Some familiarity with computer science or numerical analysis desirable but not required.* (F,W,S)

**272A-B-C. Numerical Ordinary and Partial Differential Equations (4-4-4)**  
The numerical solution of ordinary differential equations and of elliptic, parabolic, and hyperbolic partial differential equations. *Prerequisites: Math. 170A, 172, or consent of instructor.* (F,W,S)

**277A-B-C. Topics in Numerical Mathematics (4-4-4)**  
Topics vary from year to year. May be repeated for credit with consent of adviser. *Prerequisite: consent of instructor.*

## MIDDLE EAST STUDIES

### 278. Seminar in Numerical Mathematics (1 to 4)

*Prerequisite: consent of instructor. (S/U grades permitted.)*

### 280A-B-C. Probability Theory (4-4-4)

Probability measures; Borel fields; conditional probabilities, sums of independent random variables; limit theorems; zero-one laws; stochastic processes. *Prerequisites: advanced calculus and consent of instructor. (F,W,S)*

### 281A-B-C. Mathematical Statistics (4-4-4)

Testing and estimation, sufficiency; regression analysis; sequential analysis; statistical decision theory; nonparametric inference. *Prerequisites: advanced calculus and consent of instructor.*

### 282A-B. Applied Statistics (4-4)

Sequence in applied statistics. First quarter: general theory of linear models with applications to regression analysis. Second quarter: analysis of variance and covariance and experimental design. Third quarter: further topics to be selected by instructor. Emphasis throughout is on the analysis of actual data. *Prerequisite: Math. 181B or equivalent or consent of instructor. (S/U grades permitted.)*

### 285. Statistical Inference in the Medical and Biological Sciences (4)

A first course in statistical procedures for the medical and biological sciences. Topics will be chosen from among experimental design, counts, regression and correlation, analysis of variance, survivorship, classification. Some emphasis will be given to computational techniques. *Prerequisite: consent of instructor. (This course offered only to graduate students in the medical or biological sciences and to medical students.) (W)*

### 287A. Time Series Analysis (4)

Discussion of finite parameter schemes in the Gaussian and non-Gaussian context. Estimation for finite parameter schemes. Stationary processes and their spectral representation. Spectral estimation. *Prerequisite: Math. 181B or equivalent or consent of instructor.*

### 287B. Multivariate Analysis (4)

Bivariate and more general multivariate normal distribution. Study of tests based on Hotelling's  $T^2$ . Principal components, canonical correlations, and factor analysis will be discussed as well as some competing nonparametric methods, such as cluster analysis. *Prerequisite: Math. 181B or equivalent or consent of instructor.*

### 287C. Nonparametric Analysis (4)

Topics covered will include the Mann-Whitney and Wilcoxon, sign, median, and Kruskal-Wallis tests; permutation methods in general; tests for goodness of fit, especially those based on chi-square and Kolmogorov-Smirnov statistics. *Prerequisite: Math. 181B or equivalent or consent of instructor.*

### 287D. Sequential Analysis (4)

This course will include the Wald sequential probability ratio test, operating characteristics of various sequential tests beyond the SPRT. The sequential estimation of parameters and confidence intervals and empirical Bayes methods will be discussed. *Prerequisite: Math. 181B or equivalent or consent of instructor.*

### 288. Seminar in Probability and Statistics (1 to 4)

*Prerequisite: consent of instructor. (S/U grades permitted.)*

### 289A-B-C. Topics in Probability and Statistics (4-4-4)

In recent years, topics have included Markov processes, martingale theory, stochastic processes, stationary and Gaussian processes, ergodic theory. May be repeated for credit with consent of adviser.

### 290A-B-C. Topology (4-4-4)

Point set topology, including separation axioms, compactness, connectedness. Algebraic topology, including the fundamental group, covering spaces, homology and cohomology. Homotopy

or applications to manifolds as time permits. *Prerequisites: Math. 100A-B-C and Math. 140A-B-C. (F,W,S)*

### 295. Special Topics in Mathematics (1 to 4)

A variety of topics and current research results in mathematics will be presented by staff members and students under faculty direction.

### 297A-B-C. Topics in Topology (4-4-4)

In recent years, topics have included generalized cohomology theory, spectral sequences, K-theory, homotopy theory. May be repeated for credit with consent of adviser. *Prerequisite: consent of instructor. (F,W,S)*

### 298. Seminar in Topology (1 to 4)

*Prerequisite: consent of instructor. (S/U grades permitted.)*

### 299. Reading and Research (1 to 12)

Independent study and research for the doctoral dissertation. One to three credits will be given for independent study (reading) and one to nine for research. *Prerequisite: consent of instructor. (S/U grades permitted.)*

## TEACHING OF MATHEMATICS

### 500. Apprentice Teaching (1 to 4)

Supervised teaching as part of the mathematics instructional program on campus (or, in special cases such as the CTF program, off campus). *Prerequisite: consent of adviser. (S/U grades only.)*

### 501. Computer Assistance in Mathematics Teaching (4)

Instruction in the use of scientific programming languages and UCSD computing facilities as an aid in the teaching of mathematics. One lecture. *Prerequisite: graduate-student status in mathematics. (S)*

## MIDDLE EAST STUDIES

OFFICE: 8009 Humanities and Social Sciences Building, Muir College

### Faculty

Guillermo Algaze, *Assistant Professor, Anthropology*

Suzanne Brenner, *Assistant Professor, Anthropology*

David Noel Freedman, *Professor, History*

Richard Friedman, *Professor, Literature*

Ali Gheissari, *Assistant Professor, Sociology*

David Goodblatt, *Professor, History*

Hasan Kayali, *Assistant Professor, History*

Timothy McDaniel, *Professor, Sociology*

Michael E. Meeker, *Professor, Anthropology*

William H. Propp, *Assistant Professor, History*

Gershon Shafir, *Associate Professor, Sociology*

Melford E. Spiro, *Professor Emeritus, Anthropology*

Winifred Woodhull, *Assistant Professor, Literature*

## THE MINOR

The minor in Middle East studies is an interdisciplinary program aimed at a comparative study of the Middle East (including North Africa).

The program consists of six courses, of which at least three must be upper-division courses dealing with the Middle East since the emergence of Islam, as listed here under "Core Courses." The remaining three courses may be lower- or upper-division courses chosen from either the Core Courses or the Supporting Courses; and they may be courses dealing with the ancient, medieval, or modern Middle East or a three-quarter sequence of a Middle Eastern language. All six courses must be taken for a letter grade.

The courses which make up the minor must be approved by the student's college and by the Middle East Studies Program.

Approved courses taken at other universities or through participation in the Education Abroad Program can be included as part of the minor.

## Courses

### CORE COURSES

ANRG 162. Peoples of the Near East

ANRG 166. Family and Society in the Near East

ANRG 189. Zionism

ANPR 199. Independent Study (Middle East Anthropology)

HINE 108. The Middle East before Islam

HINE 114. History of the Islamic Middle East

HINE 115. The Middle East since 1600

HINE 118. The Middle East in the Twentieth Century

HINE 166. Nationalism in the Middle East

HINE 199. Independent Study (Middle East History)

LTFR 141. French Literature (Novels in French by North African Authors)

LTGN 185. Gender and Decolonization in North African and French Literature

Poli. Sci. 121A-B. Governments and Politics of the Middle East

Poli. Sci. 121C-D. The Arab-Israeli Conflict

Soc. 158. Islam in the Modern World

Soc. 188F. Modern Jewish Societies and Israeli Society

Soc. 188H. Middle Eastern Societies

Soc. 189. Special Topics in Comparative-Historical Sociology (Middle East Topics)

Soc. 199. Independent Study (Middle East Sociology)

### SUPPORTING COURSES

ANLD 11. Human Origins (Examples from Near Eastern Archaeology)

ANGN 100. Prelude to Civilization



- ANGN 101. The Emergence of Civilization  
 ANRG 101. Near Eastern Pre-History  
 ANRG 182. Ethnography of Island Southeast Asia  
 Judaic Studies 1. Beginning Hebrew  
 Judaic Studies 2. Intermediate Hebrew  
 Judaic Studies 3. Intermediate Hebrew Continued  
 Judaic Studies 101. Introduction to Hebrew Texts  
 Judaic Studies 102. Intermediate Hebrew Texts  
 Judaic Studies 103. Advanced Hebrew Texts  
 HINE 100. The Ancient Near East and Israel  
 HINE 101. Hebrew Prophetic Literature  
 HINE 102. The Jews in Their Homeland in Antiquity  
 HINE 103. The Jewish Diaspora in Antiquity  
 HINE 104. The Bible and the Ancient Near East  
 HINE 160. Special Topics in the Bible and Ancient Near East  
 HINE 199. Independent Study (Judaic Studies)  
 HITO 100. Ancient Religions  
 HITO 101. Western Religions (Judaism, Christianity, Islam)  
 LTHE (LTGN) 151. Bible: The Prophetic Books  
 LTHE (LTGN) 152. Bible: The Narrative Books  
 LTHE (LTGN) 153. Bible: The Poetic Books  
 LTHE (LTGN) 156. Topics in the Prophets  
 LTHE (LTGN) 157. Topics in Biblical Narrative  
 LTHE (LTGN) 158. Topics in Biblical Poetry  
 Soc. 148E. Ethnicity and Politics  
 Soc. 154. International Social Problems  
 Soc. 168. Cultures and Civilizations  
 Soc. 182. Revolutions  
 Soc. 190. Senior Seminar (Ideological Trends in the Middle East)

## MOLECULAR PATHOLOGY

OFFICE: 1012 Basic Science Building, School of Medicine

### Associated Faculty:

#### Professors

- Nicholas M. Alexander, Ph.D., *Pathology*  
 Stephen Baird, M.D., *Pathology*  
 Kurt Benirschke, M.D., *Pathology and Reproductive Medicine*  
 Colin M. Bloor, M.D., *Pathology, Director*  
 Charles E. Davis, M.D., *Pathology*  
 Russell F. Doolittle, Ph.D., *Chemistry*  
 Richard Dutton, Ph.D., *Biology*

- Marilyn G. Farquhar, M.D., *Pathology*  
 James Feramisco, Ph.D., *Medicine*  
 Joshua Fierer, M.D., *Medicine and Pathology*  
 Martin Haas, Ph.D., *Biology*  
 Alan F. Hofmann, M.D., Ph.D., *Medicine*  
 John J. Holland, Ph.D., *Biology*  
 Martin F. Kagnoff, M.D., *Medicine*  
 Michael Karin, Ph.D., *Pharmacology*  
 Thomas A. Lane, M.D., *Pathology*  
 Katsumi Miyai, M.D., Ph.D., *Pathology*  
 Michael N. Oxman, M.D., *Medicine and Pathology*  
 Henry C. Powell, M.D., *Pathology*  
 Samuel I. Rapaport, M.D., *Medicine and Pathology*  
 Douglas Richman, M.D., *Pathology and Medicine*  
 Michael G. Rosenfeld, Ph.D., *Medicine*  
 Deborah H. Spector, Ph.D., *Biology*  
 Robert D. Terry, M.D., *Neuroscience and Pathology*  
 Gernot Walter, Ph.D., *Pathology*

#### Associate Professors

- Michael Bevilacqua, M.D., Ph.D., *Pathology*  
 David Allen Brenner, M.D., *Medicine*  
 Pojen Chen, Ph.D., *Medicine and Pathology*  
 Kenneth Chien, M.D., *Medicine*  
 Daniel James Donoghue, Ph.D., *Chemistry*  
 Theo N. Kirkland, M.D., *Pathology and Medicine*  
 Michael J. Kelner, M.D., *Pathology*  
 Ann Rearden, M.D., *Pathology*  
 David Schubert, Ph.D., *Salk Institute*  
 Bartholomew M. Sefton, Ph.D., *Salk Institute*  
 Clayton A. Wiley, M.D., Ph.D., *Pathology*

#### Assistant Professors

- Elizabeth Broome, M.D., *Pathology*  
 Susan Carroll, Ph.D., *Pathology*  
 Mark Kamps, Ph.D., *Pathology*  
 Jan E. Schnitzer, M.D., *Medicine*

#### Adjunct Professors

- Floyd Bloom, M.D., *Neurosciences*  
 Lynette B. Corbeil, D.V.M., Ph.D., *Pathology*  
 Minoru Fukuda, Ph.D., *Pathology*  
 Frances D. Gillin, Ph.D., *Pathology*  
 Erkki Ruoslahti, M.D., *Pathology*  
 Bartholomew Sefton, Ph.D., *Pathology*  
 Saraswati Sukumar, Ph.D., *Pathology*

#### Research Series

- George G. Glenner, M.D., *Research Pathologist*

## THE GRADUATE PROGRAM

The goal of the molecular pathology Ph.D. program is to provide research training in the pathobiology of disease for physicians, health scientists, and biologists. The program is interdepartmental in nature. It is centered in the De-

partment of Pathology, but faculty members are also drawn from other departments and institutions. The program provides a comprehensive knowledge of normal and abnormal biological processes, with particular emphasis on the molecular mechanisms of human diseases.

## COURSE WORK

The course requirements are designed to ensure that all students acquire competence in cellular and molecular pathology. The requirements are flexible in order to allow students from various backgrounds to join the program. Students holding a bachelor's degree in one of the biological sciences are required to take the introductory course in pathology taught for medical students. This requirement may be waived for students holding medical graduate degrees (M.D. or D.V.M.). All students must take five of seven core courses offered by faculty members from the Department of Pathology. These courses cover topics in molecular pathology, cancer, infectious disease, human genetic disease, nervous system disease, and developmental disorders.

## EXAMINATIONS

### First Qualifying Examination (Minor Proposition)

The purpose of this examination is to test the student's ability to choose a research problem in molecular pathology and to propose an experimental approach to its solution. The problem should be unrelated to the student's thesis project. The student is expected to demonstrate knowledge in molecular biology and basic pathology. For students with a B.A. in biology, the first qualifying examination will be taken at the end of the fall quarter of the second year. Students holding an M.D. degree take this examination at the end of the spring quarter of the first year.

### Second Qualifying Examination (Major Proposition)

The second qualifying examination, a university requirement, consists of an oral report by the student about research accomplished and the goals to be achieved for completion of the thesis. Upon successful completion of the examination, the student will advance to candidacy. The second qualifying examination has to be taken by the end of the third year.

## TEACHING

All students are encouraged to assist in teaching laboratories in the core histology/pathology course for medical students.



## DEPARTMENTAL PH.D. TIME LIMIT POLICIES

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed six years. Total registered time at UCSD cannot exceed seven years.

## Courses

### 208-G. Human Disease (8)

An integrated consideration of the general principles of pathology and microbiology, epidemiology, and medical therapeutics of the important diseases. An example of their application to a specific organ system will be included.

### 221. Molecular Pathology of Cancer (4)

The purpose of this course is to present exciting new developments in molecular carcinogenesis, with particular emphasis on oncogene expression and functions of oncogenic proteins. The relevance of molecular mechanisms for understanding human cancer will be discussed.

### 222. Readings in Molecular Pathogenesis (2)

Readings, presented by graduate students, to explore topics currently investigated in specialized areas of molecular mechanism of human diseases and provide opportunities for students to gain experience in the organization. Critical evaluation and oral presentation of information from literature.

### 223. Concepts in Viral Pathogenesis (4)

The course is designed to develop a basic understanding of viral pathogenesis and how this relates to human disease. Contributions of virus and the immune system in the progression of disease and recovery will be discussed.

### 224. Frontiers in Neurovirology (2)

This course will examine in depth the spectrum of nervous system disease caused by viruses. Beginning with an overview of the history of neurovirology, general concepts in the pathogenesis of central nervous system infections will be discussed.

### 225. Molecular Pathology Seminar (2)

Group and individual discussion of current literature and ongoing research activities. The format of SOM 225 will encourage student participation. Students are to present on their rotation work or current research project.

### 231. Modern Methods in Cellular and Molecular Pathology (4)

This course presents key concepts and methodologies used in cellular and molecular pathology research. Topics will include cell membrane transport, protein purification, recombinant DNA techniques, DNA sequencing, and PCR technology. The relevance of these methods for investigating human disease will be discussed.

### 296. Directed Reading (1-4)

Reading and laboratory study of special topics under the direction of a faculty member. Exact subject matter to be arranged in individual cases.

### 299. Independent Study or Research (1-12)

Independent study or research.

## Courses

### 199. Muir Special Project (4-16)

A course of independent work on a research or creative project to satisfy a Muir graduation requirement. (Only Muir students who have had Muir Special Project proposals approved may enroll in this course.) Students wishing to enroll must submit a written request with a description of the project. (Muir students must submit the Muir Special Project 199 form to the major adviser and to the Office of the Provost by the seventh week of the quarter prior to the quarter in which the 199 is to be undertaken. For information on other requirements, consult the provost's office.) *Prerequisites: upper-division status, approval by project adviser and by provost. (Letter grades only.)*

## THE WRITING PROGRAM

The Muir College Writing Program is a sequence of courses in critical thinking and the writing of expository prose. During these courses, students must advance beyond the basic competency expected at entrance to understand and write discourse acceptable at the university level. Even when faced with challenging topics, students must demonstrate the ability to comprehend texts at more than a superficial level; their writing must exhibit focused theses, systematic methods of analysis and argumentation, awareness of the needs of their audience, strong organization and development, clear presentation of ideas, appropriate syntax and diction, and—needless to say—correct grammar and usage.

To achieve these ends, the courses focus on principles of analysis and reasoned argumentation. Through close reading of texts, students learn both to identify underlying issues, assumptions, and values, and to identify rhetorical strategies by which these are conveyed or revealed. Students also learn to monitor and adapt their own writing processes. Since the ability to evaluate one's own writing and carry out appropriate revision strategies is particularly crucial to effective writing, all students are required to revise their papers several times. Attention is devoted to developing skill in evaluation and revision in discussion sections and in individual conferences with instructors. Sections of MCWP 50 vary in theme and content, giving students the opportunity to write in areas that interest them or that may be relevant to their major fields. (Descriptions of the MCWP 50 sections are available each quarter in the Muir Writing Program office during preregistration.)

Students entering fall quarter 1985 and after are required to take both MCWP 40 and MCWP 50 for a letter grade in their first year of residence at the college. Beginning fall quarter 1987 all transfer students, upon satisfaction of Subject A, must take MCWP 40 and MCWP 50 in their first year of residence. In cases where more than

one quarter of practice is needed to prepare a student for MCWP 50, an IP grade is given in MCWP 40, and the student takes MCWP 41. Completion of the sequence allows students to meet the Muir College writing requirement.

Certain exceptionally well-prepared students, particularly transfer students, may satisfy MCWP 40 or MCWP 50 by examination. The Muir challenge examinations are given at the beginning of fall and winter quarters only. Students may not take the challenge in the same quarter in which they expect to graduate.

### 40-50. Critical Writing (4-4)

A sequence in university reading and writing required of all Muir College students who have not completed comparable courses elsewhere. Satisfies the Muir College graduation requirement in writing. MCWP 40 introduces students to the basic elements of argument and analysis. MCWP 50 focuses on advanced skills of argument and analysis. In both courses, students will engage in close reading of texts, weekly writing and revision, and individual conferences. Both courses must be taken for a letter grade. Those who need additional work to prepare for MCWP 50 will be given a grade of IP and will be required to take MCWP 41. *Prerequisite: satisfaction of Subject A requirement.*

### 41. Special Study in Writing (4)

An individualized writing class including both class discussion and tutorials. Students confer individually with instructors on a regular weekly basis to talk about writing problems. The course is designed for students who have taken MCWP 40 or its equivalent but need additional writing practice to prepare for MCWP 50. MCWP 41 does not satisfy the first part of the Muir Writing requirement. MCWP 41 must be taken for a letter grade and must be taken within two quarters of MCWP 40. *Prerequisite: MCWP 40 or its equivalent.*

## MUSIC

OFFICE: 110 Mandeville Center for the Arts

### Professors

Robert Erickson, M.A., *Professor Emeritus*  
Peter Farrell, M.M., *Professor Emeritus*  
Brian Ferneyhough, Dip. Mus.  
Jean Charles Francois, 1<sup>er</sup> Prix  
Edwin Harkins, Ph.D., *Vice Chair*  
Cecil Lytle, B.A.  
F. Richard Moore, Ph.D.  
Thomas Nee, M.A., *Professor Emeritus*  
János Négyesy, Dip. Mus.  
Wilbur Ogdon, Ph.D., *Professor Emeritus*  
Carol Plantamura, M.F.A., *Chair*  
Roger Reynolds, M.M.  
John Silber, Ph.D., *Professor Emeritus*  
Harvey Sollberger, M.A.  
Bertram Turetzky, M.A.  
Joji Yuasa

### Associate Professors

Gerald Balzano, Ph.D.  
John Fonville, D.M.A.

Philip Larson, M.M.  
George Lewis  
Jann Pasler, Ph.D.  
Steven Schick, M.M.

#### Assistant Professors

Marnie Dilling, Ph.D.  
Aleck Karis, M.M.  
Rand Steiger, M.F.A.  
Jane Stevens, Ph.D.

#### Lecturer

James Cheatham, Dip. Mus.

#### Artists in Residence

Celin Romero, Dip. Mus., B.A.  
Pepe Romero, B.A.

#### Affiliated Faculty

Kenneth Anderson  
Garrett Bowles, Ph.D.  
David Chase, D.M.A.  
Warren Gref

The Department of Music is dedicated to the development of musical intelligence. The goal of its graduate program is to educate researchers who will extend the musical intelligence of the entire music community; its undergraduate program aims to enhance the musical intelligence of students in their appreciation of the music-making process.

In addition to our regular faculty, the Department of Music regularly invites outstanding composers and performers as visitors. Previous visitors have been John Cage, Toru Takemitsu, Henry Brandt, Joan Tower, Charles Wuorinen, Iannis Xenakis, and Anthony Braxton.

## THE UNDERGRADUATE PROGRAM

The special characteristic of the undergraduate program in music at UCSD has been its attempt to coordinate graduate activity with undergraduate studies. By involving undergraduate students whenever possible with faculty and graduate students, undergraduates are offered special opportunities for enlarging their musical abilities and understanding. In particular, the department affords its undergraduates a unique opportunity to gain advanced familiarity with contemporary thinking about and practice of music.

Undergraduate courses offered in the Department of Music satisfy a wide range of student interests for non-music majors as well as for students majoring in music. For students with little background in the study of music, there are three sets of introductory courses: those that lead the student to a personal understanding of the nature of music through various projects in which mu-

sic is made and performed by the students themselves (Music 5); those that develop basic skills musicians use in the analysis and performance of music (Music 1A-B-C); and those that introduce students to the music heritage of traditional and contemporary cultures (Music 4-14). For students who have more background and who intend to continue in upper-division music theory and practice courses, Music 2A-B-C (instead of 1A-B-C) is essential.

Diverse offerings in music literature courses (numbered 111 through 127) are also available to all UCSD students.

Particular major or minor requirements and course prerequisites may be waived by examination for students with sufficient background in music.

Although careers in music have generally been associated with performance in large ensembles or with teaching in music education programs, there is a growing number of opportunities which relate to more individualized combinations of practical and technical skills. These might include, for example, arts management, recording and computer-related business, and music publishing. One cannot prepare adequately for most professional roles in music with a bachelor's degree, but a strongly practical, flexible, and broadly conceived training at the undergraduate level is, we believe, the ideal route to the widest range of future possibilities.

## FACILITIES

### Music Library

The Central University Library houses an extensive collection of holdings in standard and contemporary music, including an archive of recordings of most Department of Music performances.

### Computer Music Instructional Facilities

In addition to facilities for general instruction in electroacoustic music, the department maintains a sophisticated facility for the support of graduate and undergraduate instruction in computer music. The department's Computer Music Instruction Laboratory (CMIL) consists of a network of powerful computer music workstations configured for instructional use by researchers at UCSD and located in the Department of Music. Access to all instructional facilities is limited to students enrolled for credit in specific courses, currently including Music 160A-C, 161, 162, 163A-B-C or 263A-B-C.

## MAJOR PROGRAMS

The Department of Music is committed to active, inventive music making; thus all music majors are encouraged and normally expected to participate in an ensemble performance group each quarter. As a minimum, every major is required to enroll in Music 95, Music 130, or Music 131 ensemble performance for at least six quarters, with three quarters of participation specifically in a reading chorus (Music 95C, 95D, or 95K). (Transfer students will be credited for corresponding activities at other institutions.)

Two undergraduate major programs in music leading to the B.A. degree are offered at UCSD. The **music major program** is intended for students who are interested in music as one of the fine arts and may wish later to engage in music as a profession; most of the courses in this major involve the student in the performance as well as the analysis of music. This major thus requires extensive development of technical musical skills. A student without the appropriate level of those skills upon entrance to UCSD must devote considerable time to attaining them, either in lower-division courses or independent study. For that reason, this program is suited for students in Muir, Third, Fifth, and Warren College whose college requirements permit considerable specialization in the lower division; however, Revelle College students with training in music prior to entrance at UCSD may also pursue this program.

The **music/humanities program** is intended for students who are interested in music as one of the liberal arts and wish to gain extensive knowledge and appreciation of music that will enable them to form part of an understanding, sophisticated musical public. Because it does not require training in music prior to entrance into UCSD nor extensive, time-consuming training in musicianship skills, it fits the special need of students in Revelle College, although it is open also to students in Muir College, Third College, Fifth College, and Warren College who do not plan to pursue a career in music or to undertake graduate studies.

A new major in music with emphasis in computing and the arts is currently being developed. If you are interested, please inquire in the music department.

All courses to be counted toward satisfying major requirements in music must be passed with a grade of C or better.

While special studies courses (Music 194, 198, 199) are made available to music students, they are generally not allowed as substitutes for required courses.

A minimum residency of one year is required of all music majors; however, most students take at least two years to complete requirements after transferring to UCSD.

**Pre-Music Major Requirements**

To qualify for the music major, Music 2C and Music 2CK (Basic Keyboard) must be passed with a grade of A or B.

**THE MUSIC MAJOR PROGRAM**

All required music major courses must be taken for a letter grade, with the exception of Music 143, which should be taken on a Pass/No Pass basis. All courses to be counted toward satisfying the major requirements must be passed with a grade of C or better, except Music 2C and Music 2CK (Basic Keyboard), which must be passed with a grade of A or B.

Transfer students must pass a proficiency test for Music 2C and Music 2CK (Basic Keyboard) with a grade of A or B.

The lower-division requirements for this major are Music 5, Music 2A-B-C, and Music 2AK-BK-CK. For students in this program Music 5 and 2A, B, or C may be taken concurrently. To complete the major requirements the following courses are required:

1. Music 101A-B-C.
2. Music 102A-B-C.
3. Music 120 A-B-C.
4. Two quarters of Music 133 (normally taken in the winter quarters of the junior and senior years).
5. Music 111 or Music 114.
6. One of the following sequences: Music 103A-B-C (*composition*), Music 160A-B-C (*music science and technology*), three quarters of Music 132 (*performance*), or three additional courses from the series Music 111-127 (*literature*).
7. Six quarters of Music 95, 130, or 131 (three from 95C, 95D, or 95K).
8. Music 143 every quarter.

**HONORS**

The requirements for a B.A. degree with honors in music are the same as the music major program, but with specification that twelve additional unit-credits be taken in courses in the area of emphasis: advanced performance (specifically in Music 132R), advanced composition (specifically in Music 103D-E-F), advanced music science and technology (Music 163A-B-C and/or 199), or advanced music literature (Music 111-127 and/or 199). To be admitted to the honors program, a student must pass an audition before a jury of faculty members from the department; to graduate with honors the student must

give a public presentation of the results of the honors study. In accordance with university regulations, however, only 20 percent of students graduating in any academic year, who fulfill departmental requirements will be granted departmental honors. Faculty will review honors candidates in the spring quarter only.

**THE MUSIC/HUMANITIES MAJOR PROGRAM**

The lower-division requirements for this major are a total of two courses: Music 1A and 5. In addition, twelve upper-division courses are required to satisfy the major requirements, of which six must be music literature courses (Music 120A-B-C and three other courses selected from Music 111 through 127); the other six must form a coherent set of humanities or fine arts upper-division courses relevant to a music major. For example, the six related courses might all be in art history, or they might be courses distributed over several departments (e.g., history, literature, and visual arts), all dealing with the baroque period in the arts. Advance approval of these six related courses must be secured in writing from the departmental music-humanities major adviser. To complete this major, six quarters of participation in ensemble performance—through enrollment in Music 95, 130, or 131—is required. Continuous enrollment in Music 143 (department seminar) is also required. All music/humanities majors must submit, in writing, a course proposal to their music faculty adviser at the beginning of their junior year.

**TRANSFER STUDENTS**

Students who plan to transfer into the Department of Music should have strong skills in basic musicianship. For those planning to emphasize performance, solid proficiency on the instrument is required. A general course in the history of music is recommended.

To verify the acceptability of transfer courses, students should make an appointment with a Department of Music adviser. A degree check will be done and results placed in the student's file. All transfer students must pass a proficiency examination in Music 2C (Basic Musicianship) and Music 2CK (Basic Keyboard) with a grade of A or B. They should also plan to provide transcripts and syllabi for any music history, literature, performance, composition, or technology courses taken elsewhere that they wish to have counted.

**MINOR PROGRAMS**

Students must seek advice and obtain approval from a departmental adviser prior to em-

barking upon a minor program. Please obtain a Department of Music brochure of approved minors from the department office. To satisfy the noncontiguous minor requirements for Revelle College or the optional minor requirements for Fifth, Muir or Third College, a student may take twenty-four quarter-units in music courses with a grade of C or better, of which twelve quarter-units must be in upper-division courses. To satisfy one of the two required Warren College programs of concentration for the B.A. degree, a student may take twenty-four quarter-units in music courses with a grade of C (or P) or better; of these a sufficient number must be earned in upper-division courses to bring the total number of upper-division quarter-units in the two programs of concentration to twenty-four. In lieu of programs of concentration, Warren College B.S. in engineering majors may select one of two required three-course area studies from a special list of options in humanities and fine arts. (One of the three courses must be upper-division.)

**ADVISING OFFICES**

Music	Professor Pasler, 118
Humanities	Mandeville Center, 534-6754
Fifth	Professor Larson, B-138 Mandeville Center, 534-6650
Muir	Professor Balzano, B-127 Mandeville Center, 534-2087
Revelle	Professor Plantamura, 110 Mandeville Center, 534-3230
Third	Professor Cheatham, B-140 Mandeville Center, 534-2182
Warren	Professor Karis, 2146 Warren Lecture Hall, 534-8876
M.A.	Professor Fonville, 2144 Warren Lecture Hall, 534-4712
Ph.D.	Professor Jane Stevens, 119 Mandeville Center, 534-6754

**Staff Contacts:**

Undergraduate:  
Stephanie Ferneyhough, 110/124  
Mandeville Center, 534-8227 or 534-8226

Graduate:  
Eleanor Little, 109 Mandeville Center,  
534-3279

**THE GRADUATE PROGRAM**

The department offers programs leading to the degree of master of arts in music and the degree of doctor of philosophy in music.

Normally, students will be admitted to begin graduate studies in the fall quarter only; applications should be submitted by January 15 of the admission year. Failure to meet that deadline will

jeopardize the applicant's opportunity for admission and financial support. Applicants to graduate studies in music must submit, as part of the application, the following:

1. Tapes demonstrating their level of vocal and/or instrumental performance. It is expected that applicants will be acceptably proficient in one area of performance skills. Composition students should submit taped examples of your works being performed, and of performance skills if you wish.
2. Composition applicants submit a repertory list of works performed during the past year and a sample of printed concert programs in which they have participated.
3. A minimum of two papers illustrating ability in any one of the following: analysis, criticism, aesthetics, or music technology. Since our programs contain an academic component, the required papers are for the purpose of determining writing skills.
4. Composition applicants submit a minimum of two scores of instrumental works with tapes of these (and also of electronic compositions, if desired).
5. Scores attained on the Graduate Record Examination—including the Aptitude Test and the Advanced Test in Music—given by the Educational Testing Service of Princeton, New Jersey. Foreign students must submit TOEFL scores.
6. Official transcripts.

After an **advisory examination** administered during the week prior to the start of classes in the fall quarter, each new student will meet with the departmental M.A. or Ph.D. adviser. Students found to be deficient in any areas covered on the advisory examination (dictation and error recognition, style recognition, guided composition, analysis, sight reading, keyboard proficiency, history and literature, technology) will be expected to remedy deficiencies during their first year and will be retested at the end of that first year. **Students will not be advanced to candidacy until all deficiencies are remedied.** The appropriate departmental adviser or the student's individual adviser must approve student course programs each quarter prior to registration for classes, as well as any significant change in those programs.

To assure that all requirements are being adequately met, all graduate students must make an appointment with the curriculum coordinator for a degree check periodically, and at least no later than during the winter quarter of the second year.

## MASTER'S DEGREE PROGRAM

The department offers work leading to a master of arts in music with emphasis on *composition, performance, computer music, or theoretical-experimental studies*. The degree requires admission to the graduate program and completion of at least thirty-six quarter-units of graduate courses (courses numbered 201-299), including six units of Music 299 bearing directly on completion of the master's thesis. Master's students are expected to complete all requirements for the degree in six quarters of residence.

### COURSE REQUIREMENTS

Since the department at all levels encourages the actual making of new music, all master's candidates are required to share in this activity by enrolling in **Music 201**, Projects in New Music Performance, for both years of their residence at UCSD. (Performers must take 201A-B-C laboratory 1, Twentieth-Century Ensemble, every quarter; non-performers must take 201B, winter quarter, twice, as well as Music 228, Conducting.) In addition, all graduate students are expected to attend regularly the departmental colloquia and concerts aimed at extending and sharing their musical experience, and they are encouraged to use these as opportunities to present their own work, their research, and their creative interests.

Because of the importance of technology in present-day music, all graduate students must become familiar with and capable of handling the appropriate technological facilities of the department; to that end, graduate students wishing to use electronic studios or take Music 263 are required to pass an examination in the modern technology of music by the end of their first quarter at UCSD or to enroll in Music 160A, 161, 162. In addition, all M.A. students are required to take Music 210, Musical Analysis, and Music 291, Problems and Methods of Music Research and Performance. To complete their emphasis requirements, students concentrating on *composition* in their M.A. programs must take the composition seminar sequence Music 203A-B-C and two courses in theoretical or experimental studies. At the end of the fall and spring quarters, juries are held at which the student's current compositions are heard. If the level of work is deemed unacceptable by the assembled composition faculty, the student may not continue with individual study under 203D or pursue a thesis with compositional emphasis. Such students will pursue their degree work in another emphasis. Students emphasizing *performance* must take the performance sequence 232 (a minimum of four quarters) and *two* courses in music literature or

performance practices chosen from Music 211-224.

Students who wish to emphasize *theoretical-experimental studies* or *computer music* in their M.A. programs must demonstrate proficiency in either composition or performance by satisfactorily (grade of B or better) completing, in their first year, either the composition seminar sequence Music 203A-B-C or the performance sequence 232A-B-C. In the second year, students emphasizing *theoretical-experimental studies* must take two courses in theoretical studies (207s), and one course in experimental studies (206s); students emphasizing *computer music* must take a total of four quarters of 263 (Advanced Music Technology Seminar) in computer-related areas, plus one quarter of theoretical or experimental studies (206 or 207).

To supplement their course programs (*a full-time graduate student is required to carry a minimum of twelve units per quarter*), the student may choose among a variety of graduate or upper-division courses in music or related courses in other departments, as approved by the student's adviser. If the student's research area calls for reading proficiency in one or more foreign languages, the student's master's thesis committee will require that the student present evidence of proficiency. In order to be able to certify that its graduates are competent teachers of music, the department requires that a master's candidate serve as an apprentice teacher under the supervision of a member of the faculty; this requirement is satisfied by earning a total of six units of credit in Music 500. If a funded teaching assistant appointment is not available, it is the student's responsibility to find and propose an appropriate way of fulfilling this requirement. All graduate students must enroll in the department seminar, Music 143, every quarter.

A folio of three research papers in professional format (normally to be written in connection with the courses the student will be taking) must be accepted by the student's committee prior to approval of the thesis.

### THE M.A. PROGRAM

FALL	WINTER	SPRING
<b>COMPOSITION EMPHASIS</b>		
<i>First Year</i>		
203A	203B	203C
291	201B	228
210		
*Other	*Other	*Other
<i>Second Year</i>		
203D	299	299
206/207	207/206	
	201B	
*Other	*Other	*Other



**PERFORMANCE EMPHASIS**

First Year		
232	232	232
291		
201A	201B	201C
210		
*Other	*Other	*Other

Second Year		
232D	299	299
Lit./Perf. (211-224)	Lit./Perf. (211-224)	
201A	201B	201C
*Other	*Other	*Other

**THEORETICAL-EXPERIMENTAL STUDIES EMPHASIS**

First Year		
203A/232A	203B/232B	203C/232C
206	201B	
210		228
291		
*Other	*Other	*Other

Second Year		
207	299	299
	207	
	201B	
*Other	*Other	*Other

**COMPUTER MUSIC EMPHASIS**

First Year		
263	263	263
210	201B	228
203A/232A+	203B/232B+	203C/232C+
291		
*Other	*Other	*Other

Second Year		
263	299	299
	201B	
206 or	207	
*Other	*Other	*Other

†Students emphasizing computer music must take either the 203 composition seminars or the 232 performance sequence in their first year, and either 206 (Experimental Studies) or 207 (Theoretical Studies) during the second year.

\*Other courses and activities will include electives, Music 500, Music 143, departmental colloquia, and concerts.

**MASTER'S THESIS**

M.A. candidates will present a thesis consisting of the following under the supervision of the student's graduate adviser in Music 299:

1. Candidates emphasizing *composition* will prepare a folio of three chamber compositions together with tape recordings of at least two of them.
2. Candidates emphasizing *performance* will present a lecture-recital lasting an hour—the program to be approved by the departmental master's degree adviser.
3. Candidates emphasizing *theoretical-experimental studies* will write an extended research paper (thesis) on a topic chosen with their adviser.

4. Candidates emphasizing *computer music* will write a research paper (thesis) and present a lecture-performance in which the scientific, technological, and musical aspects of an original computer music composition are documented, played, and discussed.

The specific nature of the thesis to be undertaken—including the types of compositions in the folio for composition emphasis, the program of the lecture-recital for performance emphasis, the topic of the extended research paper for theoretical-experimental studies emphasis, and the nature of the computer music project—must be approved in advance by the student's master's thesis committee, typically in the student's fourth quarter in residence. The entire thesis must be approved by that committee upon completion.

**DOCTORAL DEGREE PROGRAM**

Students of superior musical competence may pursue a program with emphasis in *composition* or in *theoretical-experimental studies* leading to the Ph.D. in music, under the general requirements for the doctor of philosophy degree as described in the section "Graduate Studies" of this catalog. Emphasis in *composition* or in *theoretical-experimental studies* is not necessarily incompatible with significant stress on performance or computers. The specific departmental requirements for the degree are:

1. Admission to the graduate program and successful completion of an M.A. degree, including requirements equivalent to those described above for the M.A. in music. (Students with graduate degrees or courses from other institutions will be appropriately credited. Music 160A and Music 210 must be taken in the first quarter of the Ph.D. program and Music 291 in the second quarter if proficiency cannot be demonstrated. Music 201A-B-C and 228 must also be taken as described in the typical Ph.D. program [see below] if the student has not participated in UCSD's master's degree program.)
2. A minimum of eight doctoral-level seminars beyond the M.A. to be approved in consultation with the student's committee. Ph.D. students are expected to take two or three 209-level seminars during each of their first two years, and these four courses, in addition to four of two each chosen from the 206/207 offerings, will be counted towards the required eight. (Please see following "Typical Programs for the Ph.D." for additional basic required course work.)
3. a. One research paper judged to be of publishable quality *to be completed prior to qualifying examinations*.

N.B. The subject of the "publishable paper" will be developed during the student's first two years

and must be approved by the student's Ph.D. committee chair. The student and his or her committee chair should discuss the paper topic and a date for presentation of the first draft to be due some time during spring (sixth) quarter of the student's second year. At that point the paper will be reviewed by the student's entire committee. A final version of the paper will be presented to the committee chair before the last day of fall quarter (seventh quarter) of the student's third year.

If the paper is acceptable, a date for the qualifying exam will be set for the following spring quarter (ninth quarter); if not, the student has one and one-half quarters to make the necessary improvements.

b. For students taking a *composition* emphasis, an additional folio of not fewer than three compositions (not previously accepted for an M.A. degree) *to be completed prior to qualifying examinations*.

N.B. Composition students must take the 203A-B-C seminar series as well as 203D, individual study, with a member of the composition faculty.

4. The Department of Music strongly recommends that entering graduate students have acquired knowledge of at least one foreign language.
5. Demonstration through written and oral examinations of a comprehensive understanding of literature and theory of the field.
- N.B. All required course work as well as the publishable paper must be completed previous to qualifying (written and oral examination) for the Ph.D. degree.
6. An acceptable dissertation (*theoretical-experimental studies*) or a major composition project (*composition*).
7. A final public defense of the dissertation/composition (twelfth quarter).
8. Six units of credit in Music 500, Apprentice Teaching (unless the student has completed this requirement in UCSD's master's degree program).
9. Music 143 every quarter until qualifying exams are passed.

Materials previously submitted for other degrees are not acceptable for submission for the Ph.D. degree.

The required courses beyond the requirements for the M.A. are assigned by the student's doctoral adviser after review of the student's academic background and abilities, as confirmed by appropriate departmental testing. However, the student should not expect these courses alone to prepare him or her for doctoral examinations. The student is expected to choose other electives in music and electives in other disciplines, such as



history, literature, art history, philosophy, and physics when useful. The student will also undertake independent studies, supervised by an appropriate member of the faculty, and prepare himself or herself in the library and laboratory for qualifying examinations.

In addition, the doctoral student is expected to continue participation in departmental colloquia and music-making activities.

### TIME LIMIT POLICY FOR THE DOCTORAL DEGREE

The normative time for the Ph.D. in music is four years (with previous master's degree), six years (without previous master's degree). Educational fee grants are provided to students within normative time after advancement to Ph.D. candidacy and until accrued time in graduate status exceeds the normative time.

*Maximum Time Limits in the Ph.D. Program:* maximum four years precandidacy, maximum six years financial support, maximum total registered time six years in the Ph.D. program. *Students who have not completed all Ph.D. requirements within the maximum total registered time will no longer be permitted to register for classes.*

N.B. A total of *six quarters only* will be counted as M.A. time. Quarters beyond six are counted toward total registered time to the Ph.D. degree for those students admitted to the doctoral program.

### TYPICAL PROGRAM FOR THE PH.D. IN MUSIC FIRST AND SECOND YEARS

FALL	WINTER	SPRING
<b>COMPOSITION</b>		
<i>First Year</i>		
203A(Ph.D.) (210) (291)	203B(Ph.D.) 201B	203C(Ph.D.) (228)
209—four or more required for the Ph.D. degree		
*Other	*Other	*Other
<i>Second Year</i>		
203D	299	299
206/207—four or more required for the Ph.D. degree		
201B		
209		
*Other	*Other	*Other
<b>THEORETICAL-EXPERIMENTAL STUDIES</b>		
<i>First Year</i>		
†232/203/263 (201A) (210) (291)	†232/203/263 201B	†232/203/263 (201C) (228)
209—four or more required for the Ph.D. degree		
*Other	*Other	*Other

<i>Second Year</i>		
206 (232)	299	299
††(206/207—four or more required for the Ph.D. degree)		
201B		
*Other	*Other	*Other

\*Other courses and activities include electives, Music 500, Music 143, departmental colloquia, and concerts.

†Students emphasizing performance should take the 232 sequence; those emphasizing composition should take the 203 sequence; and those with computer music emphasis should take three quarters of 263 in computer-related topics.

††Doctoral students emphasizing computer music may replace one 206/207 requirement with three 263s or two 206/207's with four 263s.

#### First and Second Years

(see charts above)

Eight approved seminars and a publishable paper (plus 201A-B-C, 210, 228, and 291 if required)\*\*

Additional courses for breadth

Six units of Music 500 (if not already completed)

Music 143 every quarter

#### Third and Fourth Years

Written and oral qualifying examination

Dissertation writing

Dissertation defense

\*\*cf., above under 1.

## Courses

NOTE: These course offerings outline the general scope of our program. Not all courses are offered every year. It is essential that students work closely with departmental advisers when planning their degree programs.

### LOWER DIVISION

#### 1A-B-C. Musical Literacy (4-4-4)

Primarily intended for students whose major is other than music, this course develops musical abilities through a conceptual understanding of the structure of music together with listening exercises and techniques. Topics include musical notation, melodic transcription, scales, chords, intervals, keys, rhythm, meter, and rudiments of musical form. *Prerequisites: none.*

#### 2A-B-C. Basic Musicianship (4-4-4)

Primarily intended for music majors. Development of basic skills: perception and notation of pitch and temporal relationships. Introduction to functional harmony. Studies in melodic writing. Drills in sight singing, rhythmic reading, and dictation. Music majors must be concurrently enrolled in Music 2AK, 2BK, and 2CK (Basic Keyboard). *Prerequisite: passing score on placement exam. Must be taken in sequence.*

#### 2AK-BK-CK. Basic Keyboard (2-2-2)

Scales, chords, harmonic progressions, transposition, and simple pieces. For music majors, to be taken concurrently with Music 2A-B-C. *Prerequisite: concurrent enrollment in Music 2A, B, C.*

#### 4. Introduction to Music (4)

The development of musical perception through the direct experience of listening. Topics include sound, texture, rhythm, melody, harmony, structural functions, means of organization, and form. Listening will include examples of Western music from the Middle Ages to the present, jazz, folk music, and the music of other cultural traditions. *Prerequisites: none.*

#### 5. Introduction to Music Making (4)

A one-quarter course designed to discover musical potential and expand musical experience. No knowledge of music, notation, or instrumental skill is necessary. Small lab sessions present music through composing, improvising, and performing. Results take the form of works for tape, theatre, voices, or instruments. *Prerequisites: none.*

#### 7. Music, Science, and Computers (4)

An exploration of the interactions among music, science and technology, including the development and history of science and technology from the perspective of music, and the modern resynthesis of these disciplines, occurring around computers. *Prerequisites: none.*

#### 8. American Music (4)

A course designed to study the development of music in America. The focus will be on both the vernacular traditions including hymn singing, country music, jazz, big band, rock, etc., as well as the cultivated traditions of various composers from William Billings to John Cage. *Prerequisites: none.*

#### 9. Symphony (4)

The symphonic masterworks course will consist of lectures and listening sessions devoted to a detailed discussion of a small number of recognized masterworks (e.g., Mozart, Beethoven, Berlioz, Stravinsky, Ligeti, etc.). *Prerequisites: none.*

#### 10. Chamber Music (4)

Chamber Music will consist of lectures and listening sessions devoted to a detailed discussion of recognized chamber masterworks (e.g., Haydn, Mozart, Beethoven, Bartok, etc.). *Prerequisites: none.*

#### 11. Folk and Popular Music (4)

A course on folk and popular musics of the world, all geographic regions. Folk and/or popular music will be covered through lectures, films, and listening sessions devoted to detailed discussion of music indigenous to varying countries/areas of the world. *Prerequisites: none.*

#### 12. Opera (4)

Opera masterworks will consist of lectures, listening labs, and films. An in-depth discussion of five operas written between 1642-1925 by Monteverdi, Mozart, Verdi, Bizet, and Berg is included. *Prerequisites: none.*

#### 13. Topic/World Music (4)

A course in the perception of music from traditions in Asia, Africa, the Americas, the Middle East, Europe, and Oceania. Emphasis is on acquiring skills for listening to foreign or familiar musics with more awareness and for considering music within a people's way of life. No prior technical knowledge of music is necessary. May be taken for credit three times. *Prerequisites: none.*

#### 14. Contemporary Music (4)

This course offers opportunities to prepare oneself for experiences with new music (through preview lectures), hear performances (by visiting or faculty artists), to discuss each event informally with a faculty panel: an effort to foster informed listening to the new in music. *Prerequisites: none.*

#### 32. Instrumental/Vocal Instruction (2)

Individual instruction in instrumental or vocal technique and repertory. Intermediate level. For declared music majors: students must be enrolled in courses in the music major curriculum. Students must audition for performance faculty on first Monday of classes. *Prerequisites: department stamp required.*

Enrollment by consent of instructor after audition. May be taken for credit six times.

**32G. Group Instrumental Instruction (2)**

Group instruction in instrumental or vocal technique and repertory. Intermediate level. Intended for students who make an important contribution to Department of Music ensembles. *Prerequisites:* Written recommendation of ensemble director and audition for performance faculty on first day of classes required. Department stamp required. May be taken for credit six times.

**95. Ensemble Performance (2)**

Performance in an ensemble appropriate to student abilities and interests. Normally each section requires student participation for the whole academic year, with credit for participation each quarter. Music majors should enroll in at least one section each quarter. Not all sections will be offered every year. May be repeated for credit. Grading on participation level, individual testing, comparative papers on repertoire covered, etc. *Prerequisites:* audition and consent of instructor for each section.

Section A. Symphony Orchestra

Section B. Instrument Choir

Section C. Concert Choir

Section D. Symphonic Chorus

Section E. Chamber Orchestra

Section F. Collegium Musicum

\* Section G. Gospel Choir

Section H. Chamber Opera (Not offered in 1991-92.)

Section I. Music Theater (Not offered in 1991-92.)

Section J. Jazz Ensemble

Section K. Chamber Singers

Section L. Wind Ensemble

Section M. Madrigal Singers

Section N. Non-Western Music

\* Music 95G Gospel Choir may be taken for three units by consent of instructor only by students participating in extra concert activities.

**UPPER DIVISION**

**101A-B-C. Music Theory and Practice I (4-4-4)**

Study of the materials and structures of music through hearing, analysis, writing, and performance. Writing in two voices (101A) and four voices (101B-C). Continues sight singing, dictation, and keyboard. *Prerequisite:* Music 2C and 2KC, with grade of A or B. Department stamp required.

**102A-B-C. Music Theory and Practice II (4-4-4)**

Advanced study of the materials and structures of music. Chromatic harmony and twentieth-century techniques. Aural discrimination, analysis, exercises, and short compositions. Continues sight singing, dictation, and keyboard. *Prerequisites:* Music 101A-B-C. Department stamp required.

**103A-B-C-D-E-F. Seminar in Composition (4-4-4-4-4-4)**

Individual projects in composition critically reviewed in seminar with fellow student and faculty composers. *Prerequisites:* Music 2A-B-C; Grade of A or B in 103C to go on to 103D. Department stamp required.

**110. Doing Ethnomusicology (4)**

A how-to course in the practice and theory of studying the music of contemporary cultures. Students will record, document, analyze, and present music from their local environment. Designed for students in music, ethnic studies, anthropology, and the social sciences. *Prerequisites:* none.

**111. World Music Traditions (4)**

A study of particular regional musics in their repertory, cultural context, and interaction with other traditions. Topics vary.

*Prerequisite:* upper-division standing or consent of instructor.

**112. Studies in Vocal and Choral Literature (4)**

A critical study of representative works for solo voice (with piano or other accompaniment) and/or for choral ensemble. Music majors are assigned additional projects. *Prerequisites:* none, Music 4 or 120 recommended, or consent of instructor. (Not offered in 1991-92.)

**113. Studies in Opera (4)**

A critical study of representative operas. At least one opera discussed will be selected because of the opportunity to see it in staged performance. Music majors are assigned additional projects. *Prerequisites:* none, Music 4, 7, or 120 recommended, or consent of instructor. (Not offered in 1991-92.)

**114. Music of the Twentieth Century (4)**

An exploration of materials and methods used in the music of our time. There will be an extra discussion group for music majors. May be repeated once for credit. *Prerequisites:* none, Music 5 recommended, or consent of instructor.

**115. Women in Music (4)**

An historical survey of women musicians from the Middle Ages to today. The course will deal with an historical view of women's place as creative and representative artists, the societal and political influences that governed their existence and their music. *Prerequisite:* consent of instructor.

**116. Medieval and Early Renaissance Music (4)**

The development of an operational and intellectual account of medieval and early Renaissance music. Music majors are assigned additional projects. *Prerequisites:* none, Music 4, 7, or 120 recommended, or consent of instructor.

**117. Late Renaissance and Early Baroque Music (4)**

Functional performance problems and realizations of music of the sixteenth and seventeenth centuries. Music majors are assigned additional projects. *Prerequisites:* none, Music 4, 7, or 120 recommended.

**118. Music of the Classic Era (4)**

Main emphasis will be placed on the music of Haydn, Mozart, and Beethoven and general culture of the period. Listening assignments shall be two to four hours with scores. Lectures shall include analysis of specific works together with presentation of interesting topics based on melody, harmony, counterpoint, and rhythm of the period. *Prerequisites:* none, Music 4, 7, or 120 recommended.

**119. Music of the Nineteenth Century (4)**

A critical study of European Art Music produced during the romantic period. Stress will be placed on the rise of nationalism and its effects upon the music. *Prerequisites:* none, Music 4, 7, or 120 recommended.

**120A-B-C. Survey of Music History and Literature (4-4-4)**

Intensive historical, analytical, and cultural-esthetic examination of music from Gregorian chant through the twentieth century. *Prerequisites:* None, Music 1C or 2C and theory background strongly recommended.

**122. Music Drama (4)**

In-depth analysis of the music and lyrics of important figures from the history of music theatre. Topics will vary each quarter but may include aspects of interpretation, production, direction and design, and will be integrated with musical analysis. *Prerequisites:* none. (Not offered in 1991-92.)

**123. The Orchestra and Its Literature (4)**

A study of the instruments of the orchestra: their resources, tonal effects, their use by major composers, methods of writing for modern instruments, analysis of representative scores. Music majors are assigned additional projects. *Prerequisites:* Music 4, 7, or 120 recommended, or consent of instructor.

**124. Studies in Chamber Music (4)**

A critical study of representative works for small ensemble. The literature studied is selected and may vary from course to course. Music majors are assigned additional projects. *Prerequisites:* Music 4, 7, or 120 recommended, or consent of instructor. (Not offered in 1991-92.)

**126. Introduction to Oral Music (4)**

An introductory course in the study of oral music in Western and non-Western cultures, with particular emphasis on the impact of oral transmission of ideas and customs and the nature of improvisation in various indigenous cultures. Music to be studied includes Afro-American, African, Asian, and Oceanian. Presentations by distinguished visiting artists demonstrating aspects of their native musical crafts. *Prerequisite:* consent of instructor.

**127A-B. Music of Black Americans (4-4)**

The first quarter of this course will investigate the vocal music of black American culture, primarily the development of the spiritual and the blues traditions, while the second quarter will critically study the history of jazz in America. *Prerequisites:* none.

**128. Principles and Practice of Conducting (4)**

The theory and practice of instrumental and/or choral conducting as they have to do with basic baton techniques, score reading, interpretation, orchestration, program building, and functional analysis. Members of the class will be expected to demonstrate their knowledge in the conducting of a small ensemble performing literature from the eighteenth, nineteenth, and twentieth centuries. *Prerequisites:* Music 2A-B-C and 101A-B-C. Department stamp required.

**130. Advanced Chamber Music Performance (2-4/0)**

Advanced instruction in the preparation of small group performances of representative instrumental and vocal chamber music literature. May be taken for credit six times, after which students must enroll for 0 units. *Prerequisite:* consent of instructor through audition.

**131. Jazz Improvisation (4/0)**

An extensive study of jazz improvisation, including performance techniques, concepts, and styles. Students' theoretical knowledge will be applied to their instruments, and a repertory of melodic and harmonic devices will be mastered. Also covered will be jazz soloing, demands of melodic/harmonic innovations, and modes of chord changes or progressions. May be taken for credit six times, after which students must enroll for 0 units. *Prerequisites:* basic knowledge of major-minor scales and major, minor, and dominant seventh chords on respective instruments. Basic functional keyboard techniques.

**132. Pro-Seminar in Music Performance (4)**

Individual or master class instruction in advanced instrumental/vocal performance. May be repeated for credit, but only 24 units will be counted within the 180-unit requirement for graduation. *Prerequisite:* consent of instructor through audition. Preference given to music majors and some approved music minors.

**132R. Recital Preparation (4)**

Advanced instrumental/vocal preparation for senior music majors pursuing honors in performance. Repertoire for a solo recital will be developed under the direction of the appropriate instrumental/vocal faculty member and a committee of two additional music faculty. Special audition required during Welcome Week preceding fall quarter. *Prerequisites:* by audition only; Music 132.

**133. Projects in New Music Performance (2)**

Performance of new music of the twentieth century. Normally offered winter quarter only. May be taken four times for credit. *Prerequisite:* consent of instructor through audition. (Winter quarter only.)

**143. Department Seminar (1)**

The department seminar serves both as a general department meeting and as a forum for the presentation of research and performances by visitors, faculty, and students. Required of all graduate and undergraduate music majors every quarter.

**160A. Musical Acoustics and Recording (4)**

An introduction to the acoustics of music and to modern techniques of recording sound. *Prerequisites: Music 1A-B-C or 2A-B-C and consent of instructor. Department stamp required.*

**160B. Musical Psychoacoustics (4)**

Survey of psychoacoustical phenomena, theories of hearing, and their relation to musical perception and cognition. Techniques of psychoacoustical experimentation. *Prerequisite: consent of instructor. Music 160A recommended. Department stamp required.*

**160C. Electronics in Music (4)**

Seminars in theoretical and applied research in the generation and processing of electronic sound for composition and performance. *Prerequisites: Music 160A and consent of instructor. Department stamp required.*

**161. Programming for Musical Applications (4)**

A first hands-on course in computer programming designed around the application of computers to the processing of musical sound and structures. *Prerequisites: Music 160A-B-C and consent of instructor. Department stamp required.*

**162. Introduction to Computer Music (4)**

Hands-on introduction to building instruments and creating music with computers. *Prerequisites: Music 161 and consent of instructor. Department stamp required.*

**163. Music Technology Seminar (4)**

Selected topics in music technology and its application to composition and/or performance. Offerings vary according to faculty availability and interest. May be repeated for credit. *Prerequisites: Music 162 and consent of instructor. Department stamp required.*

**195. Instructional Assistance (2)**

Assisting in the instruction of an undergraduate music class under the direct and constant supervision of a faculty member. May be taken for credit three times. *Prerequisites: consent of instructor and departmental approval.*

**198. Directed Group Study (1-4)**

Concentrated inquiry into various problems not covered in the usual undergraduate courses. *Prerequisite: consent of instructor, and department chair approval. Pass/No Pass grade only.*

**199. Independent Study (2 or 4)**

Independent reading, research, or creative work under the direction of a faculty member, provided no course covering the material to be studied already exists, and the study area derives from previous course work. *Prerequisites: consent of instructor and department chair approval. Pass/No Pass grade only. May be taken for credit three times.*

**GRADUATE**

N.B. All courses numbered 200 and above are intended for students admitted to the graduate program in music.

**201A-B-C. Projects in New Music Performance (1-4, 1-4, 1-4)**

Performance of new music of the twentieth century. All performance emphasis graduate students must take every quarter. (Please note that Lab. 1 is intended for students participating in the Twentieth-Century Ensemble.) Non-performance students must take 201B during two winter quarters.

**202. Advanced Projects in Performance (1-4)**

Advanced performance of new music with members of the performance faculty (SONOR). Students taking this course do not need to take Music 201 that quarter. Enrollment by consent of instructor/director of SONOR.

**203A-B-C. Advanced Projects in Composition (4-4-4)**

Seminar consisting of meetings and laboratory sessions devoted to the study of composition.

**203D. Advanced Projects in Composition (4)**

Individual studies in composition with a member of the composition faculty. Offered only as demand and faculty availability justifies.

**206. Experimental Studies Seminar (4)**

Seminars growing out of current faculty interests. The approach tends to be speculative and often includes individual projects as well as assigned readings. In the past, such areas as new instrumental and vocal resources, mixed media, and compositional linguistics have been offered.

**207. Theoretical Studies Seminar (4)**

Seminars on subject areas relating to the established dimensions of music and in which theoreticians have produced a substantial body of work. These include studies in analysis, timbre, rhythm, notation, and psychoacoustics. Offerings vary depending on faculty availability and interest.

**209. Advanced Music Theory and Practice (4)**

Advanced integrated studies in music theory; composition and styles study through analysis and performance. This course is intended primarily for doctoral students and may be taken by M.A. students only with special approval of M.A. adviser and course instructor.

**210. Musical Analysis (4)**

The analysis of complex music. The course will assume that the student has a background in traditional music analysis. The goal of the course is to investigate and develop analytical procedures that yield significant information about specific works of music, old and new. Reading, projects, and analytical papers. Normally offered fall quarter only.

**211. Seminar in World Music Traditions (4)**

Study of the theory, repertory, and cultural features of particular tradition musics. Related to lectures of Music 111. Designed for graduate students in music as a forum for independent projects in research, analysis, performance, composition, and experimental derivatives related to the topic. Open to qualified graduate students in related fields.

**212. Seminar in Vocal and Choral Literature (4)**

A critical and historical study of selected works and repertory. (Not offered in 1992-93.)

**213. Opera Studies (4)**

A detailed analytical study of selected operas in production in San Diego, Los Angeles, or San Francisco. *Prerequisite: consent of instructor. (Not offered in 1992-93.)*

**214. Seminar in Twentieth-Century Music (4)**

Detailed study of selected literature through the study of scores and writings, supplemented when possible by performance participation.

**215. Seminar on Women in Music (4)**

Seminar dealing with a historical survey of women musicians from the Middle Ages to the present. A view of women's place as creative and representative artists, societal and political influences that governed their existence and their music, and their impact upon their society and ours will be dealt with in depth. *Prerequisite: consent of instructor.*

**216. Medieval Music (4)**

Readings, studies, and performance problems of medieval music from antiquity to the beginning of the Renaissance. Prob-

lems of tuning, language, source materials, and media esthetics are incorporated.

**217. Seminar Studies in Late Renaissance and Early Baroque Music (4)**

The study of early music as it has to do with theoretical systems, critical analyses, music and documentary source materials.

**218. Seminar in Music of the Classic Era (4)**

A critical, analytical study of selected literature of the eighteenth century through the study of scores and writings, supplemented when possible by performance participation.

**219. Seminar in Music of the Nineteenth Century (4)**

A critical, analytical study of selected literature of the nineteenth century through the study of scores and writings, supplemented when possible by performance participation.

**220. Seminar in Bach and Related Studies (4)**

A study of content and structure in selected compositions of J. S. Bach. *Prerequisite: consent of instructor. (Not offered in 1992-93.)*

**222. Music Drama (4)**

In-depth analysis of the music and lyrics of important figures from the history of music theatre. Topics will vary each quarter but may include aspects of interpretation, production, direction and design, and will be integrated with musical analysis. (Not offered in 1992-93.)

**223. Seminar Studies in Orchestral Literature (3)**

Problems of performance and interpretation in representative works of orchestral music, including works for chamber orchestra, opera scenes, and choral works. Students will be responsible for problems of editing, bowings, and conducting. (Not offered in 1992-93.)

**224. Seminar Studies in Chamber Literature (4)**

A critical and historical study of selected works and repertory. (Not offered in 1992-93.)

**228. Conducting (4)**

This course will give practical experience in conducting a variety of works from various eras of instrumental and/or vocal music. Students will study problems of instrumental or vocal techniques, formal and expressive analysis of the music, and manners of rehearsal. Required of non-performance graduate students. *Prerequisite: consent of instructor.*

**230. Advanced Seminar in Performance of Music for Small Ensemble (4)**

Performance of representative chamber music literature, instrumental and/or vocal, through coached rehearsal and seminar studies. Course may be repeated for credit since the literature studied varies from quarter to quarter. *Prerequisite: consent of instructor.*

**232. Pro-Seminar in Music Performance (4)**

Individual or master class instruction in advanced instrumental/vocal performance. *Prerequisite: consent of instructor through audition.*

**236. Chamber Orchestra (4)**

Study and performance of standard orchestra literature in coached rehearsal sessions. A high standard of performance must be demonstrated. This course may be repeated for credit any number of times. The literature performed varies from year to year and quarter to quarter. *Prerequisite: consent of instructor through audition. (Not offered in 1992-93.)*

**237. Opera Studio (4)**

Study and performance of scenes from standard, classic operas, experimental music theatre, and chamber operas. *Prerequisite: consent of instructor through audition. (Not offered in 1992-93.)*

## NEUROSCIENCES

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### 263A-B-C. Advanced Music Technology Seminar (4-4-4)

Advanced topics in music technology and its application to composition and/or performance. Offerings vary according to faculty availability and interest. May be repeated for credit. *Prerequisites: Music 162 or equivalent plus consent of instructor.*

### 291. Problems and Methods of Music Research and Performance (2)

The course will give practical experience in historical research, including use of important source materials, evaluation of editions, and examination of performance practice problems.

### 298. Directed Research (1-4)

Individual research. (S/U grades permitted.) May be repeated for credit. Enrollment by consent of instructor only.

### 299. Advanced Research Projects and Independent Study (1-12)

Individual research projects relevant to the student's selected area of graduate interest conducted in continuing relationship with a faculty adviser in preparation of the master's thesis or doctoral dissertation. (S/U grades permitted.)

### 500. Apprentice Teaching (1-4)

Participation in the undergraduate teaching program is required of all graduate students at the equivalent of 25 percent time for three quarters (a total of six units is required).

Steven A. Hillyard, Ph.D., *Neurosciences*

Paul A. Insel, M.D., *Pharmacology*

Dilip J. Jeste, M.D., *In Residence/Psychiatry*

Harvey J. Karten, M.D., *Neurosciences and Psychiatry*

Robert Katzman, M.D., *Neurosciences*

Daniel F. Kripke, M.D., *In Residence/Psychiatry*

William B. Kristan, Ph.D., *Biology*

Ronald Kuczenski, Ph.D., *Psychiatry*

Robert B. Livingston, M.D., *Emeritus/Neurosciences*

Arnold J. Mandell, M.D., *Psychiatry*

Arnold L. Miller, Ph.D., *Adviser/Neurosciences*

Maurice S. Montal, M.D., Ph.D., *Biology and Physics*

R. Glenn Northcutt, Ph.D., *Neurosciences*

John S. O'Brien, M.D., *Neurosciences*

James W. Patrick, Ph.D., *Adjunct/Neurosciences*

Stuart Patton, Ph.D., *Adjunct/Neurosciences*

Henry C. Powell, M.D., *In Residence/Psychiatry*

Morton Printz, Ph.D., *Pharmacology*

Vilayanur S. Ramachandran, M.D., *Psychology*

Michael G. Rosenfeld, M.D., *Medicine*

David S. Segal, Ph.D., *Psychiatry*

Terrence J. Sejnowski, Ph.D., *Biology and Physics*

Allen I. Selverston, Ph.D., *Biology*

Nicholas C. Spitzer, Ph.D., *Biology*

Charles E. Spooner, Ph.D., *Neurosciences*

Larry R. Squire, Ph.D., *In Residence/Psychiatry*

Charles Stevens, M.D., *Ph.D. Adjunct/Neurosciences*

Palmer W. Taylor, Ph.D., *Pharmacology*

Robert D. Terry, M.D., *Neurosciences and Pathology*

Leon Thal, M.D., *Neurosciences*

John Thomas, Ph.D., *Adjunct/Neurosciences*

Doris A. Trauner, M.D., *Neurosciences and Pediatrics*

Robert D. Tschirgi, M.D., Ph.D., *Emeritus/Neurosciences*

Roger Tsien, Ph.D., *Pharmacology*

Wylie Vale, Ph.D., *Adjunct/Medicine*

Silvio S. Varon, M.D., Eng.D., *Biology*

Tony Yaksh, Ph.D., *Anesthesiology*

W.C. Wiederholt, M.D., *Neurosciences*

Samuel S.C. Yen, M.D., *Reproductive Medicine*

Justin Zivin, M.D., *Neurosciences*

### Associate Professors

David G. Amaral, Ph.D., *Adjunct/Neurosciences*

Karen Britton, M.D., Ph.D., *Psychiatry*

Joan Heller-Brown, Ph.D., *Pharmacology*

Stephen L. Foote, Ph.D., *In Residence/Psychiatry*

Richard Haas, M.D., *Neurosciences and Pediatrics*

Vicente J. Iragui-Madoz, M.D., Ph.D., *Clinical Neurosciences*

George F. Koob, Ph.D., *Adjunct/Psychology*

Marta Kutas, Ph.D., *Cognitive Science*

E. Roger Marchand, Ph.D., *Adjunct/Neurosciences*

Pamela Mellon, Ph.D., *Neurosciences*

Robert R. Myers, Ph.D., *Anesthesiology*

Helen J. Neville, Ph.D., *Adjunct/Neurosciences*

Daniel T. O'Connor, M.D., *In-Residence/Medicine*

Tsunao Saitoh, Ph.D., *Neurosciences*

Ajit Varki, M.D., *Medicine*

Stuart Zola-Morgan, Ph.D., *In-Residence/Psychiatry*

### Assistant Professors

Thomas Albright, Ph.D., *Adjunct/Neurosciences*

Gordon Baylis, Ph.D., *Psychology*

Richard L. Hauger, M.D., *Psychiatry*

John Kelsoe, M.D., *Psychiatry*

Christopher Kintner, Ph.D., *Adjunct/Neurosciences*

Greg Lemke, Ph.D., *Adjunct/Neurosciences*

Mark Montminy, Ph.D., *Adjunct/Neurosciences*

Barbara Ranscht, Ph.D., *Adjunct/Neurosciences*

Dennis D. Rasmussen, Ph.D., *Reproductive Medicine*

Veronica Roberts, Ph.D., *Reproductive Medicine*

Clifford Shults, M.D., *Neurosciences*

Linda Sorkin, Ph.D., *In-Residence/Anesthesiology*

Neal Swerdlow, M.D., *Ph.D. In-Residence/Psychology*

Matthew Weinger, M.D., *Anesthesiology*

Charles G. Zucker, Ph.D., *Biology*

## THE GRADUATE PROGRAM

The group in the neurosciences accepts for the Ph.D. degree candidates with undergraduate majors in such disciplines as biology, chemistry, engineering, microbiology, mathematics, physics, psychology, and zoology. A desire and competence to understand how the nervous system functions is more important than previous background and training.

## DOCTORAL DEGREE PROGRAM

Students in this program receive guidance and instruction from a campus-wide group of faculty interested in nervous system mechanisms. Each student, in consultation with an advisory committee, selects courses relevant to his or her interests and goals which also provide a solid grounding in the several disciplines of preclinical neurosciences. The selection will include formal courses listed in this catalog and informal seminars offered by the department. Close association among students, faculty, and postdoctoral personnel adds to this informal, tutorial type of instruction. A regular schedule of rotation through the laboratories of faculty members is a

## NEUROSCIENCES

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OFFICE: 3036 Basic Science Building, School of Medicine

### Professors

Ursula Bellugi, Ed.D., *Adjunct/Psychology*

Darwin K. Berg, Ph.D., *Biology*

Reginald G. Bickford, M.D., *Emeritus/Neurosciences*

Floyd E. Bloom, M.D., *Adjunct/Neurosciences and Psychiatry*

Reginald G. Bickford, M.D., *Emeritus/Neurosciences*

Theodore H. Bullock, Ph.D., *Emeritus/Neurosciences*

Nelson Butters, Ph.D., *Psychiatry*

Eric Courchesne, Ph.D., *Neurosciences*

J. Anthony Deutsch, Ph.D., *Psychology*

Mark H. Ellisman, Ph.D., *Neurosciences*

John W. Evans, Ph.D., *Mathematics*

Edmund J. Fantino, Ph.D., *Psychology*

Fred H. Gage, Ph.D., *Group Chair and Director/Neurosciences*

Robert Galambos, M.D., Ph.D., *Emeritus/Neurosciences*

Mark A. Geyer, M.D., *Psychiatry*

J. Christian Gillin, M.D., *Psychiatry*

Charles Gray, Ph.D., *Adjunct/Neurosciences*

Philip M. Groves, Ph.D., *Psychiatry*

Walter F. Heiligenberg, Ph.D., *Behavioral Physiology*

Stephen F. Heinemann, Ph.D., *Adjunct/Neurosciences*



feature of the first year; the student is exposed in this way to the various approaches, techniques, and disciplines represented on the campus. A period of study at one of the other campuses of the University of California can be arranged by mutual agreement.

### COURSE WORK

There are few formal course requirements for the Ph.D. degree. However, by the time of the minor proposition (see below), students are expected to demonstrate competence through written examination in at least four of the following areas of neurosciences designated as "core": neuroanatomy (Neurosci. 256/257), molecular and cellular neurochemistry (Neurosci. 234), neuropsychopharmacology (Neurosci. 277), neurophysiology (Neurosci. 262), molecular and cellular neurobiology (Neurosci. 268), behavior (Neurosci. 264), and development (Neurosci. 263). The faculty offers core courses in all of these areas, and students frequently demonstrate minimal competence in an area by enrolling in the appropriate course and passing its final examination. Students are permitted to substitute an area of neurosciences not currently designated a core area for competency; e.g., neuroendocrinology. Such a substitution would require approval by the graduate adviser.

### MINOR PROPOSITION

The purpose of this examination is to test the student's ability to choose a problem in the neurosciences and propose an experimental approach to its solution. The problem should be broad, requiring experimental approaches from more than one discipline. The problem should be out of the area of the student's anticipated dissertation research. Students will be required to demonstrate a working knowledge of the disciplines involved in the minor proposition.

Oral defense of the minor proposition will be required at the beginning of the winter quarter of the second year of study. Exemptions may be granted to entering students already holding a master's degree. This exemption would only pertain to the creative written part of the exam. All students are required to take the second part of the exam which tests general neuroscience knowledge.

### DISSERTATION

During the second year, students are expected to propose and initiate work on a dissertation problem under the guidance of a faculty preceptor. The neurosciences group at UCSD currently conducts animal research and clinical studies in

the fields of neuroanatomy, neurochemistry, neuropharmacology, neurophysiology, comparative neurology, physiology of excitable membranes, synaptic transmission, neuronal integration and coding, nervous system tissue culture, neuroimmunology, brain function, sensory physiology, motor mechanism, and systems analysis as applied to neurological problems. Facilities are available for research on marine forms, vertebrate and invertebrate.

### QUALIFYING EXAMINATION

This examination, a university requirement, will normally focus on the proposed research that the student will undertake for his or her dissertation. Demonstration of competence in the four core areas declared earlier should have been exhibited previous to the qualifying examination, e.g., final examination scores from one or more of the core courses. The examination should be taken no later than the end of the spring quarter of the third year.

### DISSERTATION EXAMINATION

The required formalities listed in the *Instruction for Preparation and Submission of Doctoral Dissertations* issued by the Office of Graduate Studies and Research to students should be followed closely. The final examination includes both a public presentation followed by a closed defense of the dissertation with members of the committee.

### TEACHING

Students are expected to teach and to develop their talents as teachers. To this end, opportunities to lecture and to assist in laboratory exercises and demonstrations are provided.

### PH.D. TIME LIMIT POLICIES

Students must be advanced to candidacy by the end of three years. Total university support cannot exceed six years. Total registered time at UCSD cannot exceed seven years.

## Courses

### UNDERGRADUATE

**199. Independent Research (2 or 4)**  
Laboratory research under the supervision of individual members of the faculty of the neurosciences department in one or a combination of neurosciences disciplines, e.g., neuroanatomy, neurophysiology, neurochemistry, neuropharmacology. (P/NP grades only.) *Prerequisite: consent of department chair.* (F,W,S)

### GRADUATE

- 233. Comparative Vertebrate Neurobiology (4)**  
Survey of the organization and evolution of vertebrate nervous systems. *Prerequisite: consent of instructor.* (S/U grades only.) (F)
- 234. Molecular and Cellular Neurochemistry (4)**  
Topics include membrane and nerve function in nervous system, structure and function of receptors for neurotransmitters, role of cAMP as a second messenger in the nervous system, synthesis and processing of neuropeptides. (S/U grades only.) (W)
- 243. Physiological Basis of Human Information (2)**  
Psychological processes including attention, perception, and memory will be studied in connection with event-related potentials of the human brain. The interrelations among psychological and physiological events will be explored in order to arrive at unified concepts of human information processing. *Prerequisites: Neurosci. 238 or Psych. 231, and consent of instructor.* (S/U grades only.) (F)
- 246. Advanced Neuroanatomy (2)**  
The purpose of this course is to present selected advanced topics in the anatomy of the nervous system. It will emphasize the organization of functional systems but consideration of neural ultrastructure and growth and development will be included. (S/U grades only.) (S)
- 251. Scientific Communication (2)**  
(Same as SIO 292) Forms of scientific communication, practical exercise in scientific writing and short oral communication, and in criticism and editing, preparation of illustrations, preparation of proposals; scientific societies and the history of scientific communication. Examples from any field of science, most commonly biology, marine biology, ecology, and neuroscience. *Prerequisite: Graduate status in science.* (S/U grades only.)
- 252. Information Processing in Man (1)**  
Reports of ongoing research into human information, with emphasis on electrophysiological changes during attention to, and perception and comprehension of, visual, auditory, and somatic stimuli.
- 253. Clinical Neuroanatomy (1)**  
Review of neuroanatomy, with emphasis on clinical correlations. Pertinent physiological, chemical, and clinical information will be included and functional organization will be stressed. It is essential that students be familiar with neuroanatomical nomenclature. *Prerequisite: medical student, graduate student, intern, resident, or consent of instructor.* (S/U grades only.)
- 256. Mammalian Neuroanatomy (4)**  
Lectures presenting the basic features of the anatomy of the mammalian nervous system. This will include consideration of cellular components, development, topographic anatomy, and a detailed presentation of the organization of functional systems. *Prerequisite: graduate status or consent of instructor.* (S/U grades only.) (F)
- 257. Mammalian Neuroanatomy Laboratory (4)**  
Neuroanatomy laboratory course taught in conjunction with Mammalian Neuroanatomy (256). Laboratories deal with gross and microscopic neuroanatomy of brain systems. Sessions include microscopic analysis of histological sections and observations and dissections of human brain material. *Prerequisite: Neuroanatomy 256 or concurrent enrollment.* (S/U grades permitted.) (F)
- 259. Workshop in Electron Microscopy (4)**  
This course is to introduce graduate students in the neurosciences to research methods used in electron microscopy (EM) through one hour of formal lecture, one hour of seminar,



three hours of demonstration, and three hours of supervised laboratory work per week. Students will become familiar with sectioning EM, scanning EM, and freeze-fracture EM. *Prerequisites: graduate-student standing in neurosciences doctoral program and consent of instructor. Enrollment limited. (S/U grades only.) (S)*

**262. Neurophysiology (4)**

An overview of neurophysiological systems, emphasizing mammalian neurophysiology and related model vertebrate systems and concepts. *Prerequisites: graduate student status in neurosciences, biology or physiology-pharmacology, or medical student, core course in neurophysiology and core course in neuroanatomy or equivalent. (S/U grades permitted.) (W)*

**263. Developmental Neurobiology (3)**

(Same as Biology 258.) Cellular and developmental aspects of the nervous system. Methods of investigation and culture approaches. Basic neuroembryology and selected examples of regional developments. Neuroglial cells and neuron-glia interactions. Extrinsic controls of survival growth and maturation of neural cells. Neurite growth and synapse formation. Potential for plasticity and regeneration in the nervous system. *Prerequisite: graduate students or consent of instructor. (S/U grades only.) (S)*

**264. Behavioral Neuroscience (5)**

The course is to cover different areas of behavioral biology, such as ethology, behavioral biology, learning and memory, perception psychophysics. Some outside reading will be required. *Prerequisite: medical student, graduate student, or consent of instructor. (S/U grades only.) (S)*

**268. Molecular and Cellular Neurobiology (4)**

This course focuses on cellular anatomy of the nervous system at the molecular level. The lectures will communicate current molecular genetic and cell biological approaches used to study the specialized structures and cell types of nervous tissue. Topics will include cell organelles; chromatin structure/function; gene expression/regulation; cytoskeleton and membrane interactions; signal transduction/receptors, channels and pumps; cellular junctions/synapses; node of Ranvier; and neuroplasmic transport. *Prerequisites: neurochemistry, neuroanatomy, biochemistry. (S/U grades permitted.) (F)*

**269. Electroencephalography and Clinical Neurophysiology (1)**

Using the *Journal of Electroencephalography and Clinical Neurophysiology* as a core text, subjects chosen from the journal will be discussed and critically evaluated by the participants, and the literature pertinent to each topic reviewed. *Prerequisites: Neurosci. 238, Basic Neurology (205), neurology resident, or consent of instructor. (F,W,S)*

**274. Neurobiology of Cognitive Developmental Disorders (2)**

Neurobiological foundation of developmental disorders in information processing including infantile autism, developmental dysphasia, attention deficit disorder, and childhood schizophrenia. Neurophysiological, neuroanatomical, and psychological evidence will be explored. *Prerequisite: undergraduate or graduate course in neurobiology. (S/U grades permitted.) (W)*

**275. Advanced Topics in Neuroscience (2)**

Specialized advanced topic areas in neuroscience will be addressed in an interactive seminar course format. A different specific topic area will be considered each quarter as announced in advance. Students will present an aspect of the topic area and participate in discussions. *Prerequisite: graduate status or consent of instructor. (S/U grades only.) (F,W,S)*

**276. Neuroscience Research Rounds (2)**

Neurosciences group faculty members and graduate students will present and discuss ongoing research. Attendance will be

mandatory for first- and second-year graduate students. Faculty, advanced graduate students, medical students, postdoctoral trainees, and other interested parties are encouraged to attend. (S/U grades only.) (F,W,S)

**277. Neuropsychopharmacology (4)**

An examination of the molecular and biochemical bases of drug and transmitter action. The course is devoted to receptor mechanisms, neuropharmacology, and drug action on excitable tissues. (W)

**278. Clinical Neurosciences (4)**

This course is intended to provide graduate students with an understanding of the clinical approach to neurological disease; the psychological, neuropsychological, and pathological aspects of major human neurological disorders; and the relation of clinical phenomenology observed in these disorders. *Prerequisite: Neurosci. 256/257. (S/U grades permitted.) (W)*

**279. Molecular Glycobiology (2)**

(Same as Biomed. Sci. 222, Chem. 237, Medicine 225) Molecular glycobiology encompasses studies of the structure, biosynthesis, and biological roles of oligosaccharide units on glycoconjugates. This course will provide an overview of this rapidly evolving field, with an emphasis on the glycoconjugates of eucaryotic organisms in the animal kingdom. (S)

**296. Neurosciences Independent Research (1-12)**

Independent study. (S/U grades only.) (F,W,S)

**298. Neurosciences Independent Study Project (ISP) (1-12)**

*Prerequisite: approved ISP proposal. (F,W,S)*

**299. Neurosciences Research (1-12)**

Independent study. (S/U grades only.) (F,W,S)

**401. Neurology General Clinical Selective Clerkship (7)**

Provides opportunities for practical application of neurological skills to the understanding and treatment of a variety of clinical disorders of the nervous system. *Prerequisite: successful completion of first two years of medical school. (F,W,S)*

**425. Subinternship in Neurology (7)**

The subinternship involves the primary care of hospitalized neurology patients under the direct supervision of a neurology resident and attending physician. Subinterns are expected to assume total primary care of their patients, to perform all procedures, and to participate in night call, daily neurology teaching rounds, and weekly Grand Rounds. *Prerequisite: Neurology 401 or consent of instructor. (S/U grades only.)*

**426. Subintern Pediatric Neurology (7)**

Subinterns are responsible for the primary care of hospitalized pediatric neurology patients under direct resident and attending physician supervision. They will perform procedures such as lumbar puncture and participate in night call, daily teaching rounds, neurology Grand Rounds, and Journal Clubs. *Prerequisite: Neurology 401 or consent of instructor. (F,W,S)*

**496. Clinical Independent Study (1-12)**

Independent clinical study for medical students. (S/U grades only.) (F,W,S)

**500. Apprenticeship Teaching (1-4)**

Participation in the departmental teaching program is required of all students working toward a Ph.D. degree. In general, students are not expected to teach in the first year, but are required to serve as teaching assistants or tutors for one quarter at any time during their subsequent years of training. The amount of teaching required is equivalent to the duties expected of a 50 percent teaching assistant for one quarter. *Prerequisite: neurosciences graduate students. (S/U grades only.) (F,W,S)*

▼ **P HILOSOPHY**

OFFICE: 3108 Galbraith Hall, Revelle College

**Professors**

- Henry E. Allison, Ph.D.
- Richard J. Arneson, Ph.D.
- Paul M. Churchland, Ph.D.
- Patricia Smith Churchland, B.Phil.
- Gerald D. Doppelt, Ph.D.
- S. Nicholas Jolley, Ph.D.
- Patricia W. Kitcher, Ph.D.
- Philip S. Kitcher, Ph.D.
- Edward N. Lee, Ph.D.
- Stanley W. Moore, Ph.D., *Professor Emeritus*
- Frederick A. Olafson, Ph.D., *Professor Emeritus*
- Robert B. Pippin, Ph.D., *Chair*
- Avrum Stroll, Ph.D., *Professor Emeritus*
- Zeno Vendler, Ph.D., *Professor Emeritus*

**Associate Professor**

- George H. Anagnostopoulos, Ph.D.

**Assistant Professors**

- Adrian Cussins, D.Phil.
- Sandra D. Mitchell, Ph.D.
- Gila Sher, Ph.D.
- Steven Yalowitz, Ph.D.

**Adjunct Professor**

- S.-Y. Kuroda, Ph.D.

**INTRODUCTION TO THE DEPARTMENT**

Philosophy is the study of conceptual problems that pertain to the nature of knowledge, reality, and human conduct. Among the chief areas of the subject are logic, metaphysics, theory of knowledge, ethics, political philosophy, and the philosophy of science. The academic study of philosophy at UCSD emphasizes a sound understanding of the history of the discipline and the development of analytical skills, and an undergraduate major in philosophy may be regarded as an excellent preparation for many careers in which such skills are emphasized.

The Department of Philosophy also offers a graduate program leading to the M.A. and Ph.D. degrees. It is the intention of the graduate program to enable the student to obtain an understanding of divergent philosophical traditions and to develop as a philosopher in his or her own right. To this end, the department offers courses and seminars in the history of philosophy, philosophy of language, philosophy of mind, philosophy of science, ethics, social philosophy, contemporary Anglo-American and European philosophy, etc.

## UNDERGRADUATE PROGRAM — MAJOR

The Department of Philosophy offers the degree of bachelor of arts (B.A.) in philosophy for the undergraduate major.

A major in philosophy requires a total of fifteen courses, of which twelve or more must be from the upper division (courses numbered 100 and above).

### ENTRY-LEVEL COURSES

To maximize student options, the department offers a wide variety of lower-division courses and entry-level sequences, with no specific courses or sequences being required. The student's introduction to philosophy can thus be interest-driven. For example, any combination of three courses numbered in the 1-99 range will provide an adequate grounding for entry into most upper-division courses (although see the specific prerequisites cited for some upper-division courses).

### AREA REQUIREMENTS FOR THE MAJOR

**1. History of Philosophy Requirement:** The department requires all of its majors to complete three history courses, one in each of the following areas:

- a. ancient philosophy,
- b. early modern philosophy,
- c. late modern philosophy.

This requirement can be met early, by taking the lower-division 31, 32, 33 sequence, or it can be met later, by taking three appropriate courses from the 101-107 group, or by some suitable combination of these alternatives.

**2. Logic Requirement:** Philosophy 110 is required of all majors. Note that Philosophy 110 has Philosophy 10 (or an equivalent course from another department or institution) as a prerequisite. Since Philosophy 110 is a prerequisite in turn for a variety of upper-division courses, prospective majors are strongly advised to take Philosophy 10 fairly early.

**3. Concentration Requirement:** In order to encourage each major to explore at least two areas of philosophy in some depth, the department requires that each major assemble two three-course sequences within the upper division, chosen from two of the following general areas. The two areas of specialization, and the three courses taken within each, are chosen at the student's discretion.

- a. history of philosophy
- b. ethics, social/political philosophy
- c. philosophy of language, logic
- d. metaphysics, philosophy of mind/psychology
- e. epistemology, philosophy of science
- f. continental philosophy

Finally, up to two upper-division courses *outside* of philosophy can count among the twelve required for a major if they are drawn from a closely adjacent field and are relevant to the student's concentration areas. Such credit must be approved by the undergraduate adviser.

Special and independent studies courses (including courses numbered 199) may not be used to satisfy major requirements. Major requirements may be met by examination.

### GRADE RULES FOR MAJORS/ MINORS

It is required that a passing grade and an overall average of 2.0 must be obtained in courses taken at UCSD fulfilling the major requirements before certification of completion will be granted. Students must attain a grade of C — or better for any course to be counted toward completion of major/minor requirements.

It should be noted that a grade of pass does not count toward fulfillment of departmental requirements for either the major or the minor.

### HONORS PROGRAM

The Department of Philosophy offers an Honors Program for outstanding students in the major. Candidates who have a 3.7 GPA in philosophy (3.25 overall) at the end of their junior year and who have taken at least four upper-division philosophy courses are eligible to apply. Students interested in participating in the Honors Program should consult with a faculty sponsor before April 15 of their junior year. Admission to the program requires nomination by the sponsor and approval of the department faculty.

In addition to the usual major requirements for graduation, an honors student is required to present a senior honors thesis at the end of winter quarter. During the fall and winter quarters, the student will engage in thesis research (Philosophy 196A and 196B), supervised jointly by the faculty sponsor and the undergraduate adviser. The award of "Philosophy Honors" is based upon the successful completion of Philosophy 696A, 196B, and the senior honors thesis. Honors students are expected to maintain an average of 3.7 or better for all work taken in the program.

### TRANSFER STUDENTS — PROCEDURE TO VERIFY ACCEPTABILITY OF COURSES

Courses taken at another institution may be used in satisfaction of major requirements, with the approval of the department. This approval is obtained by completing a petition, obtainable from the department office, and returning it to the undergraduate adviser.

### UNDERGRADUATE PROGRAM — MINOR

With the exception of Warren College, minor requirements are satisfied by any six courses, at least three of which must be upper-division. Warren College offers its own minor programs in philosophy. A list of possible Warren minor programs in philosophy can be obtained from the college office. With the approval of the undergraduate adviser, courses may be substituted for those included in the Warren programs.

### ADVISING OFFICE

Students who desire additional information concerning our course offerings or program may contact individual faculty or the undergraduate adviser through the department office at 3108 Galbraith Hall, (619) 534-3070. Prior to enrolling, students may wish to stop by the department and pick up a copy of the Course Offerings brochure prepared every quarter. The brochure contains course descriptions written by each instructor as well as brief statements by our teaching faculty concerning their background and interests.

### GRADUATE PROGRAM REQUIREMENTS

The department offers programs leading to the M.A. and Ph.D. It is the intention of the graduate program to enable the student to obtain an understanding of divergent philosophical traditions and to develop as a philosopher in his or her own right. To this end, the department offers courses and seminars in the history of philosophy and in traditional and contemporary philosophical issues, from a variety of perspectives.

### MASTER'S DEGREE PROGRAM

To qualify for a master's degree in philosophy, a student must pass eight of the distribution requirement seminars as described below, under the subheading "Distribution Requirements." At least one of the seminars must be from the ethic/social-political category, and no more than four

from either of the other two areas may count towards the master's degree. The student must also complete a master's research paper following one four-unit directed study course with a faculty member of his or her choice.

## DOCTORAL DEGREE PROGRAM

### COURSE WORK

During the first two years of residence the student's course work will normally total thirty-six units (nine courses) per year. At least twelve of these units in each year must be graduate philosophy seminars (those numbered 201-285). The balance may be made up from additional graduate courses in philosophy, upper-division courses in philosophy (those numbered 101-199), approved upper-division or graduate courses in related departments, and, if the student is a teaching assistant, Philosophy 500 (Apprentice Teaching).

Before the beginning of each term, and especially before the fall term, students are required to have their course choices approved by an assigned adviser. Courses should be chosen with an eye toward meeting the program's distribution requirements, as outlined below.

### LOGIC REQUIREMENT

During the first term of residence, all entering graduate students will take an examination designed to demonstrate their level of proficiency in formal logic. The examination covers the predicate calculus, up to and including functions, relations, and identity. Students who pass the examination with a grade of B+ or better have satisfied the first component of the logic requirement. Students who do not score a B+ or better must take Philosophy 110 during the first year of study and achieve a grade of B+ or better. By the end of the sixth term of residence, all students must also pass Philosophy 111 or 112 with at least a grade of B.

### DISTRIBUTION REQUIREMENTS

By the end of the seventh quarter of residence, a student must have completed ten graduate seminars in philosophy. The seminars must be distributed across the following areas:

1. **Four seminars** in the history of philosophy. At least one of these courses must be in ancient philosophy; at least one must be in modern philosophy.
2. **Two seminars** chosen from the fields of ethics, social philosophy, political philosophy.
3. **Four seminars** chosen (in any combination) from the fields of metaphysics, epistemology, philosophy of mind, philosophy of science, phi-

losophy of language, philosophy of mathematics, philosophy of logic.

Courses used to satisfy a requirement in one category cannot be used to satisfy a requirement in another category.

At the end of the fifth quarter of residence, a student must have completed eight of the required seminars. In order to remain in the program a student must have attained an average of B+ or better in all philosophy seminars completed by this point.

Before the beginning of each quarter, and especially before the fall quarter, a student is required to have all course choices approved by a faculty adviser.

### LANGUAGE REQUIREMENT

All students must demonstrate reading proficiency in one of the following languages:

- German
- French
- Latin
- Classical Greek

If a student's chosen dissertation topic requires competence in a second language from the above list, then the student's dissertation adviser can require suitable demonstration of competence. The language requirement must be met before the student can be advanced to candidacy.

### THIRD YEAR

In the third year of residence, the student must complete with a passing grade at least one regular graduate seminar in each quarter until the end of that year or admission to candidacy, whichever comes first.

### DISSERTATION PROSPECTUS AND ORAL CANDIDACY EXAM

Some time after completing the distribution requirements, the student must submit a dissertation prospectus to his or her doctoral committee. The committee will then orally examine the student on the intended subject and plan of the research. The examination will seek to establish that the thesis proposed is a satisfactory subject of research and that the student has the preparation and the abilities necessary to complete that research. This oral qualifying examination must be passed before the end of the twelfth quarter of residence. Students who are passed and have met the other requirements will be advanced to candidacy for the Ph.D.

### TEACHING REQUIREMENT

Participation in undergraduate teaching is one of the requirements for a Ph.D. in philosophy.

The student is required to serve as a teaching assistant for the equivalent of one-quarter time for three academic quarters. The duties of a teaching assistant normally entail grading papers and examinations, conducting discussion sections, and related activities, including attendance at lectures in the course for which he or she is assisting.

### DOCTORAL DISSERTATION

Under the supervision of a doctoral committee, each candidate will write a dissertation demonstrating a capacity to engage in original and independent research. The candidate will defend the thesis in an oral examination by the doctoral committee. (See "Graduate Studies: The Doctor of Philosophy Degree.")

For information regarding the graduate program, write to: University of California, San Diego; Graduate Adviser; Philosophy, 0302; 9500 Gilman Drive; La Jolla, CA 92093-0302. E-mail address: casmann@ucsd.edu.

### JOINT DEGREE PROGRAMS

The philosophy department at UCSD participates in two interdisciplinary programs, the requirements for which are outlined below. For each program, students are expected to satisfy roughly two-thirds of the distribution requirements in the philosophy program. This means that instead of ten philosophy seminars at the end of the seventh quarter, students must have completed six (properly distributed), and that instead of eight philosophy seminars by the end of the fifth quarter, students in those programs must have completed five, with a cumulative average of B+ or better.

### JOINT DEGREE PROGRAM WITH THE UCSD COGNITIVE SCIENCE FACULTY

The UCSD cognitive science faculty is an interdisciplinary group of twenty-seven scholars drawn from the Departments of Psychology, Neuroscience, Biology, Computer Science and Engineering, Electrical and Computer Engineering, Linguistics, Philosophy, Sociology, Anthropology, and Psychiatry. This group includes many of the outstanding figures in contemporary cognitive science.

Students wishing to pursue a Ph.D. in "Cognitive Science and Philosophy" register in the philosophy program in the normal fashion, but pursue a significant portion of their studies within an interdisciplinary group of departments affiliated with the Department of Cognitive Science. These departments include anthropology,

computer science and engineering, linguistics, neurosciences, psychology, and sociology. Students may apply for admission to the interdisciplinary program at the same time they apply to the Department of Philosophy, or at some point after entering UCSD. (All students wishing to transfer into any interdisciplinary program must do so prior to the end of the fifth quarter of residency.)

Students in philosophy/cognitive science studies are required to take:

1. A total of nine seminars in philosophy, including four courses from either history or epistemology and metaphysics, and two courses from one of the other groups listed above under the subheading "Distribution Requirements." By the end of the fifth quarter of residence, a student must have taken at least five of these seminars (distributed across at least two areas), and must have achieved an average of B+ or better in all philosophy seminars taken up to that point. Failure to take a sufficient number of seminars or to achieve a B+ average means that the student may not continue in the program after the fifth quarter.

2. The equivalent of one year's course work (usually six courses) in one or more of the other departments affiliated with the Department of Cognitive Science;

3. Six quarters of Cognitive Science 200.

A plan detailing the course of study must be approved by the Cognitive Science Program Committee. The dissertation should be interdisciplinary, reflecting the two areas of specialization.

### SCIENCE STUDIES PROGRAM

The Science Studies Program at UCSD is committed to interdisciplinary investigations. Understanding, interpreting, and explaining the scientific enterprise demand a systematic integration of the perspectives developed within the history, sociology, and philosophy of science. The program offers students an opportunity to work towards such integration, while receiving a thorough training at the professional level in one of the component disciplines.

Students enrolled in the program choose one of the three disciplines for their major field of specialist studies, and are required to complete minor field requirements in the other two. The core of the program, however, is a year-long seminar in science studies, led by faculty from all three participating departments.

Students pursuing a "Philosophy and Science Studies" degree are required to take a total of eighteen courses. At least nine of these must be in philosophy, with the remainder drawn from history of science, sociology of science, or the

sciences. The courses must satisfy distribution requirements: six seminars must be taken in philosophy by the end of the seventh quarter of residence, distributed across the three required areas listed above. No more than four and no fewer than two courses in any one area may be used to satisfy the requirements. Two courses must be taken in history of science; and two must be in sociology of science. All science studies students are required to take the science studies year-long core seminar. This seminar contributes toward the distribution requirements, counting as one seminar in history of science, one seminar in sociology of science, and one seminar in philosophy (the epistemology-metaphysics group). By the end of the fifth quarter of residence, a student must have taken at least five of these philosophy seminars (distributed across at least two areas), and must have achieved an average of B+ or better in all philosophy seminars taken up to that point. Failure to take a sufficient number of seminars or to achieve a B+ average means that the student may not continue in the program after the fifth quarter.

Students may apply for admission to the interdisciplinary program at the same time they apply to the Department of Philosophy, or at some point after entering UCSD. (All students wishing to transfer into any interdisciplinary program must do so prior to the end of the fifth quarter of residency.)

### PH.D. TIME LIMIT POLICIES

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed seven years. Total registered time at UCSD cannot exceed eight years.

## Courses

### LOWER DIVISION

The Department of Philosophy cooperates in the teaching and administration of the humanities sequence for Revelle College students. (See "Interdisciplinary Courses: Humanities.")

#### 1. The Nature of Philosophy (4)

What is philosophy? A study of some of the major questions with which philosophers deal, through the reading and analysis of classical and contemporary works, and with an emphasis on the way philosophy grows out of questions that in one way or another arise for almost everyone in ordinary life situations.

#### 10. Introduction to Logic (4)

An introduction to critical thinking and to the nature of argument, inference, and proof. How to recognize and defend against the most common forms of argumentative fallacy. How

to use some of the basic techniques of modern symbolic logic: the propositional calculus. (May be used for the Warren College formal skills requirement.)

#### 12. Logic and Decision Making (4)

An introduction to the study of probability, inductive logic, and scientific reasoning. How to make rational choices between competing hypotheses and alternative courses of action when the relevant evidence is incomplete or uncertain. (May be used for the Warren College formal skills requirement.)

#### 13. Introduction to Philosophy: Ethics (4)

An inquiry into the nature of morality and its role in personal and social life. (May be used in fulfilling the Muir College breadth requirement and the Third College humanities sequence.)

#### 14. Introduction to Philosophy: Metaphysics (4)

An introduction to metaphysical thought, especially as it relates to topics such as freedom, mind, and God. (May be used in fulfilling the Muir College breadth requirement and the Third College humanities sequence.)

#### 15. Introduction to Philosophy: Theory of Knowledge (4)

A study of the scope and nature of human knowledge in both its everyday and scientific forms. (May be used in fulfilling the Muir College breadth requirement and the Third College humanities sequence.)

#### 21. Introduction to the History of Science (4)

This course examines the dramatic development of mankind's conception of the universe from the early Greek scientists through the modern period to Einstein. Emphasis will be on advances in cosmology, astronomy, dynamics, matter theory, mathematics, and biology.

#### 22. Introduction to the Philosophy of Science (4)

An examination of recent theories about the nature of science and the character of scientific knowledge. Topics include the nature of confirmation, explanation, science vs. pseudo-science, instrumentalism vs. realism, and the ultimate aims of science. *Prerequisite:* Phil. 21 or a year of prior study in one of the science programs.

#### 23-24-25. Individual and Society (4-4-4)

A course dealing with the historical and systematic development of social and political thought and institutions. Analysis and critical examination of representative texts drawn from classical and contemporary sources. (Philosophy 23-24-25 may be used to fulfill the Muir College breadth requirement and the Third College humanities sequence.)

#### 27. Ethics and Society (4)

(Same as Poli. Sci. 27) An inquiry into the principles of ethical conduct and their applications. The course examines some of the major theories (including natural law, individual rights, utilitarianism) and the general issue of rights and obligations with respect to adherence to law (as in civil disobedience, abortion, and the refusal to obey an unjust law or order). Case studies will be employed to consider the relevance of these principles to various occupations such as business, engineering, law, and government, in order to enable students to anticipate some of the difficulties that will arise for them in real-life situations whenever hard moral choices must be made. Satisfies the Warren College ethics and society requirement. This course is required for all Warren students entering the college in fall 1985 and thereafter.

#### 31. History of Philosophy: Ancient Philosophy (4)

An introduction to the study of classical Greek philosophy. The main emphasis of the course will be on the thought of Socrates, Plato, and Aristotle, but some consideration may also be given to pre-Socratic and Hellenistic philosophers. (May be used in fulfilling the Muir College breadth requirement and the Third College humanities sequence.)



**32. History of Philosophy: The Origins of Modern Philosophy (4)**

An introduction to the study of early modern philosophy. Among the central concerns of the course will be the contrast between medieval and modern thought and the connection between the development of modern philosophy and the scientific revolution of the sixteenth and seventeenth centuries. Philosophers studied will include Descartes, Hobbes, Spinoza, and Leibniz, and possibly some medieval thinkers. (May be used in fulfilling the Muir College breadth requirement and the Third College humanities sequence.)

**33. History of Philosophy: Philosophy in the Age of Enlightenment (4)**

An introduction to the study of the major philosophers of the late seventeenth and the eighteenth centuries. The course will focus largely on the British empiricists—Locke, Berkeley, Hume—and the “Critical Philosophy” of Kant. (May be used in fulfilling the Muir College breadth requirement and the Third College humanities sequence.)

**90. Undergraduate Seminar: The Irrational (1)**

An examination of recent psychological studies of human irrationality and their implications for epistemology, education, and social policy. Course may be repeated for credit (when topics vary) up to a total of three units.

UPPER DIVISION

**101. Plato (4)**

A study of some of the major dialogues of Plato. *Prerequisite:* department stamp required. May be repeated for credit with change of content.

**102. Aristotle (4)**

A study of some of the major works of Aristotle. *Prerequisite:* department stamp required. May be repeated for credit with change of content.

**103. Medieval Philosophy (4)**

An examination of the major trends of medieval philosophy through the study of selected texts by such authors as St. Augustine, Aquinas, Scotus, and Ockham. *Prerequisite:* department stamp required. May be repeated for credit with change of content.

**104. The Rationalists (4)**

A study of some of the major writings of one or more of the seventeenth-century rationalists—Descartes, Spinoza, Leibniz. *Prerequisite:* department stamp required. May be repeated for credit with change of content.

**105. The Empiricists (4)**

A study of the major writings of one or more of the British empiricists—Locke, Berkeley, Hume, Reid. *Prerequisite:* department stamp required. May be repeated for credit with change of content.

**106. Kant (4)**

A study of selected portions of the *Critique of Pure Reason* and other theoretical writings and/or his major works in moral theory. May be repeated for credit with change of content. *Prerequisites:* department stamp required. Philosophy 33 or 105 required.

**107. Hegel and His Critics (4)**

A study of some of the essential features of the philosophy of Hegel and of the reaction to this philosophy on the part of thinkers such as Feuerbach, Marx, and Kierkegaard. *Prerequisite:* department stamp required. May be repeated for credit with change of content.

**108. Mythology and Philosophy (4)**

Study of various ancient Near Eastern mythologies in relation to early Greek philosophy.

**110. Symbolic Logic I (4)**

An introduction to the techniques of the predicate calculus, including relations and identity. Emphasis will be on acquiring skills in translating natural language into symbolic notation, in the various techniques of semantic evaluation, and especially in the use of natural deduction techniques. *Prerequisite:* Phil. 10 or consent of instructor.

**111. Symbolic Logic II (4)**

Introduction to axiomatic presentations of both the propositional and predicate calculi, and to their standard metatheory, which is the study of the important semantic and syntactic properties of these systems, such as expressive power, completeness, consistency, etc. *Prerequisite:* Phil. 110.

**112. Advanced Logic (4)**

An examination of topics in modal logic, free logic, relevance logic, or other non-standard interpretations and logical systems, plus appropriate metatheory. Course content will vary somewhat from year to year. *Prerequisite:* Phil. 110.

**113. Philosophy of Mathematics and Logic (4)**

The character of logical and mathematical truth; the relations between logic and mathematics; the significance of Godel's incompleteness result; Platonism, logicism, intuitionism, and more recent approaches. Course content may vary somewhat from year to year. *Prerequisite:* Phil. 110 or consent of instructor.

**115. Philosophy of Logic (4)**

Topics in philosophy of logic. Subjects covered vary from year to year. Typical topics include the problem of non-denoting terms (free logic), intensional contexts (Leibniz's law, identity, necessity, belief sentences). *Prerequisite:* Phil. 110.

**120. Political Philosophy (4)**

An examination of fundamental issues regarding the nature of the state, society, and government, usually by way of a comparison of the tenets of classical liberal theory and Marxism.

**121. The State and Freedom (4)**

An advanced course in political philosophy focusing on such topics as contemporary treatments of social justice and of human freedom from liberal, conservative, and radical perspectives.

**122. Bio-Medical Ethics (4)**

The course will examine moral issues arising in the medical and biological sciences. Possible topics include concept of health, patients' rights and professional responsibilities, behavior control, experimentation, genetic intervention, allocation of medical resources, and ethical issues concerning death, such as euthanasia, abortion, the rights of dying patients. *Prerequisite:* upper-division standing or consent of instructor.

**123. Ethical Theories (4)**

An examination of issues in ethical philosophy, with emphasis on the work of major historical figures in this area.

**124. Contemporary Moral Issues (4)**

An examination of contemporary issues in ethics, such as abortion, the treatment of animals, euthanasia, suicide, war. May be repeated for credit with change of content. *Prerequisite:* department stamp required.

**126. Sex Differences: Origins and Implications (4)**

(Same as Anthropology 123.) This interdisciplinary course focuses on the origins of sex differences and their political, social, and moral implications. Issues include evolutionary, biological, cross-cultural, and sociological evidence for sex differences; legal, economic, social, and psychological effects of present differential treatment of the sexes; moral issues concerning the justification of present practices; preferential treatment; sexual role stereotypes; and family organization. *Prerequisite:* upper-division standing or consent of instructor.

**127. Professional Ethics (4)**

An inquiry into the fundamental norms or principles of conduct in the various professions. The course will examine the theoretical foundations of such norms in relation to the most important ethical theories (utilitarianism, contract theories, rights theories, etc.); will explore the relation between professional and ordinary norms and conduct; and will discuss particular problem cases for various professions (legal, medical, business, engineering, etc.) in order to identify and examine those ethical features that may be unique to some professions.

**128. Seminar: Topics in Modern Political Thought (4)**

(Same as History 192 and Political Science 110K.) This course will examine the literature of specific individuals and topics, including Burke on revolution, Saint-Simon and Fourier on utopian systems, Marx on class, and Sorel on creative myth. *Prerequisite:* upper-division standing or consent of instructor.

**130. Philosophy of Language (4)**

Philosophical reflections on such linguistic universals as meaning, synonymy, analyticity, reference, grammar, and speech acts. A selection of contemporary articles will be discussed. Some background in linguistics or philosophy is desirable.

**131. Topics in the Philosophy of Language (4)**

A careful examination of a selection of topics in the philosophy of language. A typical assortment development of intensional and extensional fragments of English, the role and structure of propositions, conversation and linguistic contexts, formal and informal semantics.

**135. Contemporary Analytic Philosophy: Russell and the Vienna Circle (4)**

A course in the history of analytic philosophy dealing with the writings of Frege, Russell, Wittgenstein (*Tractatus*), Quine, Tarski, Carnap.

**136. Contemporary Analytic Philosophy: Moore and Wittgenstein (4)**

A course in the history of analytic philosophy dealing with Moore, the later Wittgenstein, Wisdom, and Austin.

**140. Phenomenology and Existentialism: From Nietzsche to Heidegger (4)**

A study of the thought of Nietzsche, Husserl, and Heidegger, with emphasis on the development of the phenomenological movement.

**141. Phenomenology and Existentialism: Sartre and His Critics (4)**

A study of existential phenomenology, through the works of its major representatives such as Sartre, Merleau-Ponty and others, as well as other recent philosophical movements on the European continent.

**145. Nihilism (4)**

A consideration of various claims about the end or collapse of the Western philosophical tradition, with particular emphasis on claims about the consequences of the absence of “ultimate” rational justification in morality, or even in science and philosophy. Readings will vary, but will most likely include works by Nietzsche, Dewey, Heidegger, Wittgenstein, Derrida; seminal texts in the history of moral and political thought; and selections from contemporary American philosophers concerned with the issue. *Prerequisite:* upper-division standing or consent of instructor.

**150. Aesthetics (4)**

An examination of major concepts and issues in aesthetics, such as truth, expression and imagination, the nature of the aesthetic attitude and of critical evaluation. *Prerequisite:* upper-division standing or consent of instructor.

**152. Philosophy and Literature (4)**

A study of philosophical themes as presented in selected fiction, drama, or poetry, as well as an inquiry into philosophical



puzzles that arise in the appreciation and criticism of literature.  
*Prerequisite: upper-division standing or consent of instructor.*

**153. Film Aesthetics (4)**

A consideration of some special problems in aesthetics relevant to film as an art form. Topics may include the problem of a film's authorship; whether there are unique assumptions in film criticism and the relation between those assumptions and others relevant to literature, drama, and visual art; unity, theme, narration, and structure in film; "high art" — "low art" distinctions; films as representational.

**160. Philosophy of Religion (4)**

This course provides a general introduction to the philosophy of religion through the study of classical and contemporary texts. Among the issues to be discussed are the existence and nature of God, the problem of evil, the existence of miracles, the relation between reason and revelation, and the nature of religious language.

**161. Religious Existentialism (4)**

This course will deal with the existential approach to the religious life and with conceptions such as faith, freedom, and guilt. Authors studied in a particular term may vary and will include Pascal, Kierkegaard, Dostoevski, Buber, and Tillich.

**162. Philosophy of Law (4)**

An introduction to selected topics and problems such as the nature of law and legal systems, the relationship of law to morality, theories of punishment and legal responsibility, issues of civil disobedience, privacy, paternalism, and affirmative action.

**164. Philosophy of History (4)**

A study of classical and contemporary conceptions of history and historical knowledge. *Prerequisite: upper-division standing or consent of instructor.*

**170. Metaphysics (4)**

The content of this course will vary from year to year, but in each case it will center around fundamental problems in metaphysics, such as the mind-body problem, problem of universals or the other-minds problem. The discussion of these issues may be either historical or analytic or both, depending upon the interests of the instructor.

**172. Knowledge and the External World (4)**

An examination of some of the fundamental issues about the nature of knowledge gained through sensory experience, such as scepticism, the structure of knowledge, justification of knowledge claims, the nature of perception, sense-data theory, the problem of other minds.

**173. Knowledge and Necessity (4)**

A course in theory of knowledge dealing with topics such as the nature of our knowledge of the necessary truths of mathematics and logic, the estimation of the probability of untested hypotheses, the validity of the distinction between *a priori* and *a posteriori* knowledge (and related distinctions).

**174. Philosophical Psychology (4)**

An examination of issues in the philosophy of mind and philosophy of action, such as the nature of beliefs, emotions, and actions and the interrelationships between them; the nature of the mental and conceptual issues arising in psychology.

**180. Advanced Philosophy of Science (4)**

A detailed examination of some of the central problems in contemporary philosophy of science. Typical topics include current theories on the nature of explanation, the nature of scientific revolutions, inductive logic and rational methodology, and scientific realism vs. various anti-realisms. *Prerequisites: Phil. 110 and either Phil. 22 or consent of the instructor.*

**181. Philosophy of Physics (4)**

An introduction to some of the most prominent philosophical problems arising from the development of modern physics. Typical topics may include the philosophy of space and time,

the epistemology of geometry, the philosophical significance of Einstein's theory of relativity, the significance of quantum mechanics, and modern cosmology. *Prerequisite: consent of instructor.*

**182. Philosophy of Biology (4)**

An examination of the philosophical problems generated by the biological sciences. Topics include the relation of biology to the physical sciences, the status and structure of evolutionary theory, the role of biology in social science, and others. *Prerequisite: consent of instructor.*

**183. Philosophy of Psychology/Neuroscience (4)**

This course examines the philosophical issues surrounding the scientific study of cognition, perception, and other mental phenomena. Topics include reductionism, functionalism, methodological and substantive issues in cognitive psychology, artificial intelligence, and the neurosciences. *Prerequisite: consent of instructor.*

**184. Philosophy of the Social Sciences (4)**

An examination of problems arising out of the concepts, methods, and goals characteristic of the social sciences. Topics include causal vs. rational explanations of behavior; the individual vs. the social whole as the unit of study; the role of values; and the meaning and possibility of objectivity and freedom as a presupposition or consequence of social theory.

**185. Special Topics (4)**

A course devoted to a specific philosophical problem. May be repeated for credit with change of content.

**186. Technology and Human Values (4)**

Traditional ideas of nature and the rise of modern science and technology. The influence of the rise of science and technology on political ideals, on human life, on freedom, education, and warfare.

**187. Philosophical Aspects of Cognitive Science (4)**

This course offers an introduction to some of the basic concepts in cognitive science, and considers some of the current debates about the nature and implications of cognitive theories. Topics may include mental representation, consciousness, rationality, nativism.

**195. Introduction to Teaching in Philosophy (4)**

*Introduction to teaching philosophy. Under the supervision of the instructor, each student will run a class section in one of the philosophy department's courses. Attendance at lectures in the course and additional consultation with the instructor are required. Prerequisites: upper-division standing and consent of instructor and department chair.*

**196A. Philosophy Honors (4)**

A program of independent study providing candidates for philosophy honors an opportunity to develop, in consultation with an adviser, a preliminary proposal for the honors essay. An IP grade will be awarded at the end of this quarter. A final grade will be given for both quarters at the end of 196B. *Department stamp required.*

**196B. The Honors Essay (4)**

Independent study under the supervision of a faculty member leading to the preparation of an honors essay. A letter grade for both 196A and 196B will be given at the completion of this quarter. *Department stamp required.*

**198. Directed Group Study (4)**

Directed group study on a topic or in a field not included in the regular departmental curriculum by special arrangement with a faculty member. (P/NP grades only.)

**199. Individual Study (4)**

*Prerequisite: consent of departmental adviser. (P/NP grades only.)*

GRADUATE

**201. Greek Philosophy (4)**

A study of selected authors and texts from the history of ancient Greek philosophy. May be repeated for credit with change of content.

**202. Hellenistic and Roman Philosophy (4)**

Selected topics drawn from the major philosophical schools in the Hellenistic and Roman periods, among them Stoicism, Epicureanism, Skepticism, and Neo-Platonism.

**203. Medieval Philosophy (4)**

A study of representative writings from one or more of the major philosophical movements of the Middle Ages.

**204. Early Modern Philosophy (4)**

A study of selected philosophers of the sixteenth and seventeenth centuries, for example, Descartes, Spinoza, Leibniz, and Locke. May be repeated for credit with change of content.

**205. Eighteenth-Century Philosophy (4)**

A study of major philosophical texts of the period, such as Kant's *Critique of Pure Reason* and Hume's *Treatise of Human Nature*. May be repeated for credit with change of content.

**206. Nineteenth-Century Philosophy (4)**

A selective study of major philosophical texts for the period, with emphasis on such figures as Hegel, Marx, Nietzsche, Mill, and others. May be repeated for credit with change of content.

**207. Contemporary European Philosophy (4)**

A study of selected topics in twentieth-century European philosophy as reflected in the major writings of Husserl, Heidegger, Sartre, Merleau-Ponty, and others.

**208. Contemporary Analytical Philosophy (4)**

A study of the historical development of the analytical movement, with emphasis on major texts. May be repeated for credit with change of content.

**209A-B-C. Seminar in Science Studies (4-4-4)**

A three-quarter sequence of readings and discussions, taught each quarter by a member of one of the departments (History, Sociology, Philosophy) participating in the graduate science studies program. Required of all students in the program in their first year; those in later years are expected to audit this course, the content of which will change from year to year. IP grade to be awarded the first and second quarters; the final grade will not be given until the end of the third quarter.

**210. Philosophy of Logic (4)**

A study of major topics in logical theory: the status of logical truth, the epistemology and metaphysics of logic, the significance of recent results in mathematical and logical theory, the significance of alternative systems of logic. *Prerequisite: Phil. 110 or equivalent.*

**211. Advanced Symbolic Logic (4)**

Topics in mathematical logic and set theory, metatheory, non-standard logics, and other contemporary developments in logical theory. *Prerequisite: Phil. 111 or equivalent.*

**212. Contemporary Topics in the Philosophy of Science (4)**

This seminar will cover current books and theoretical issues in the philosophy of science. Topics will vary from year to year. *Prerequisite: Phil. 180 or equivalent or consent of instructor.*

**215. Introduction to Formal Semantics (4)**

A general introduction to theories of sense and reference, comprising a comparative approach to Fregean, Russellian, and Tarskian semantic techniques, with emphasis on semantic primitives and the general structure of theories of truth.

## PHYSICAL EDUCATION

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### 223. Ethics (4)

An examination of the nature of moral problems, judgments, and principles, with emphasis on recent developments in moral philosophy and classic formulations of ethical theories.

### 224. Social and Political Philosophy (4)

An analysis of social philosophies and ideologies in their relationship to basic types of social structure. May be repeated for credit with change of content.

### 235. Philosophy of Language (4)

(Same as Linguistics 286.) Examination of some current philosophical and scientific views on the nature, use, and acquisition of natural languages. May be repeated for credit as course content may vary.

### 250. Aesthetics (4)

An exploration of problems in philosophy of art, aesthetic experience, and aesthetic judgment within the context of a critical survey of some current aesthetic theories and their illustrative application in various fields of art.

### 260. Philosophy of Religion (4)

A study of the philosophical foundations of religious experience, including the nature of belief and knowledge, faith and reason, God, and the character and meaning of religious commitment.

### 262. History of Law in Philosophical Perspective (4)

Course will study the way in which the historical development of the Western legal system reflects issues raised in the literature of legal philosophy. Students will read works of legal philosophy in conjunction with studies of the history of legal doctrines and institutions.

### 264. Philosophy of History (4)

An examination of basic concepts, categories, and representative philosophies of history.

### 270. Contemporary Epistemology and Metaphysics (4)

A detailed examination of some fundamental issues in contemporary philosophy, especially those centering about the theories of meaning and reference.

### 272. Theory of Knowledge (4)

An examination and critique of representative theories of mind, reality, knowledge, and perception.

### 274. Philosophy of Mind (4)

Contemporary work on the relation of mind and body, subjectivity, and the problem of other minds. May be repeated for credit with change of content.

### 285. Seminar on Special Topics (4)

A seminar for examination of specific philosophical problems. (S/U grades permitted.)

### 290. Direct Independent Study (4)

Supervised study of individually selected philosophical topics. May be repeated for credit. *Prerequisite: consent of instructor.* (S/U grades permitted.)

### 295. Research Topics (1-12)

Advanced, individual research studies under the direction of a member of the staff. May be repeated for credit. *Prerequisite: consent of graduate adviser.* (S/U grades permitted.)

### 299. Thesis Research (1-12)

(S/U grades permitted.)

### 500. Apprentice Teaching (1-4)

A course designed to satisfy the requirement that graduate students should serve as teaching assistants either in the Department of Philosophy or in the Humanities Program in Revelle College or in the writing programs offered by the various colleges. Each Ph.D. candidate must teach the equivalent of quarter-time for three academic quarters. (S/U grades only.)

## PHYSICAL EDUCATION

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OFFICE: Gymnasium, Revelle College

### Supervisors

John W. Cates, M.A., *Conditioning Coordinator*

Barry Cunningham, Ed.D.

Howard F. Hunt, Ph.D., *Emeritus*

J. Charles Millenbah, M.A., *Chair*

Bert N. Kobayashi, Ph.D., *Aquatics Coordinator*

Robert C. Moss, M.S.

Andrew Skief, Jr., M.S., *Instructional Facilities*

*Coordinator*

Judith M. Sweet, M.S., M.B.A.

Frank N. Vitale, M.S.

James R. White, Ph.D., *Team and Individual*

*Sports Coordinator*

### Associate Supervisor

Ann K. Jones, Ph.D., *Minor Coordinator*

### Teachers/Special Programs

Check the current list of instructors located in the Main Office, Department of Physical Education. For information call (619) 534-0334.

## INSTRUCTIONAL PROGRAM

The instructional program in the Department of Physical Education at UCSD consists of two major divisions:

1. A general instructional program in a variety of fitness and sport activities, and
2. An academic minor program in physical fitness and health management.

## MINOR PROGRAM

### PHYSICAL FITNESS AND HEALTH MANAGEMENT

The Department of Physical Education offers a minor in physical fitness and health management designed to provide students with an understanding of the interrelated areas of physical fitness and health. The lower-division courses are intended to give the students preparation in biology, chemistry, and social sciences, upon which the upper-division courses are built. Some of the lower-division requirements will normally be a duplication of the student's major requirements and, therefore, will not have to be repeated.

The minor is structured to study the human body from different perspectives. For example, in P.E. 84, Anatomy/Kinesiology, the structure of bones, muscles, and nerves are studied in relation to a variety of human movement situations. In P.E. 160, Exercise Physiology, the human body is studied from a physiological perspective,

which focuses on human potentials and limitations during exercise. In P.E. 170, Psychological Basis of Sport and Physical Activity, psychological explanations of human behavior, pre-, post-, and during exercise are studied. Anatomical, physiological, and psychological explanations are only partially useful, however, because they focus exclusively on the individual. The sociological perspective used in P.E. 120, Sports in America, and 121, The Black Athlete, in contrast, stresses those factors external to the individual. These five courses provide the students with an integrated understanding of the human experience in regard to exercise and physical education. For information call (619) 534-4033.

## LOWER DIVISION

Physical Education 81—Introduction to P.E.

Physical Education 84—Anatomy/Kinesiology

### Lab

Biology 13—Nutrition (Prerequisite—Biol. 10)

## UPPER DIVISION

Physical Education 120—Sports in America (Prerequisite—Soc. 1 or equivalent)

Physical Education 121—The Black Athlete (Prerequisite—Soc. 1 or equivalent)

Physical Education 160—Exercise Physiology (Prerequisite—Biol. 14, Chem. 5A, Chem. 5B)

Physical Education 160L—Exercise Physiology Lab (Prerequisite—Biol. 14, Chem. 5A, Chem. 5B)

Physical Education 170—Psychological Basis of Physical Activity (Prerequisite—Psych. 1, 2, 3, or 4)

## PHYSICAL EDUCATION MINOR FOR REVELLE NONCONTIGUOUS MINOR

To satisfy requirements for a noncontiguous P.E. minor, a Revelle student must meet all requirements specified by the P.E. department (see above). In addition to this, at least two of the lower-division courses must be noncontiguous to the major and these two courses may *not* be used for any other general-education requirement.

## GENERAL INSTRUCTIONAL PROGRAMS

The Department of Physical Education's General Instructional Program provides enthusiastic, contemporary, and comprehensive instruction in

a wide variety of fitness and sport activities designed to meet the needs and interests of all students. In addition to offering classes at beginning, intermediate, and advanced skill and fitness levels, the department also provides instruction for students who may be either temporarily or permanently disabled.

### **FITNESS CONDITIONING**

Based on student interest and in keeping with national trends, a major emphasis of the General Instructional Program in recent years has been on counseling and instruction designed to promote fitness, good nutritional habits, and healthy, active lifestyles. Physical education faculty members are available to all students for advice and suggestions on both personal programs and courses that will improve the level of students' health and fitness. Students are encouraged to establish positive attitudes and habits of lifetime fitness.

To this end, the General Instructional Program offers a multitude of fitness-related courses, including: weight training, coed conditioning, aerobics, rhythmical conditioning (using jazz and country western and ballroom dance routines), power walking, stretching/flexibility, triple fitness conditioning, interval running, and cycling. Optional fitness testing is available for all fitness/conditioning students. Results are analyzed, and students receive counseling.

### **FITNESS AND WELLNESS FOR LIFE (LECTURE/LAB)**

Physical Education also offers a two-unit lecture/lab course, PE 100, Fitness and Wellness for Life. The focus of this course is the acquisition of knowledge in basic exercise physiology, pertinent gross anatomy, psycho-social issues in exercise, and nutrition principles so that the individual student can develop a personalized cardiovascular program, create a strength and flexibility routine, develop improved eating habits and better nutritional awareness, and select appropriate stress management and relaxation techniques. While activities are used to illustrate the principles discussed, the course is designed to give the student the information necessary to make wise, lifetime health and activity choices. Therefore, lectures, labs, and practicums are used, rather than just activity sessions. Students are encouraged to sign up concurrently for one of the conditioning classes: coed conditioning, swim conditioning, aerobic dance, power walking, or water aerobics. This will provide a structured opportunity for students to apply the principles they are learning, help provide a social support system to encourage exercising, and

supply an extended opportunity for them to meet the frequency requirement of a good exercise program.

### **AREAS OF INSTRUCTION**

#### **Certificate Courses**

Lifesaving, Water Safety, CPR, and First Aid Instruction

#### **Individual and Team Sports**

##### *Individual Sports*

Tennis, Badminton, Golf, Racquetball, Tumbling and Trampoline, Karate, Fencing, and Accelerated Motor Skills.

##### *Team Sports*

Volleyball, Basketball, Softball, Soccer

#### **Aquatics Program**

Swimming, Skin Diving, Scuba Diving, Surfing, Swim Conditioning, and Water Aerobics

#### **Rehabilitation and Disabled Program**

##### *Rehabilitation*

Applied Rehabilitation

##### *Disabled Students*

Activities for the Disabled Student

For further information, call 534-7105.

### **FITNESS & LIFESTYLE PROGRAM**

The Fitness and Lifestyle Program is a non-profit physical fitness assessment service provided to students, faculty, staff, and the UCSD community. Personalized assessment, evaluation and consultation are conducted by Department of Physical Education faculty technicians who have a practical approach to fitness and lifestyle. For further information, call 534-0812.

## **Courses**

Registration for physical education classes takes place along with regular academic enrollment. Consult the *Schedule of Classes* issued by the Office of the Registrar for specific course offerings. Not all courses are offered each quarter. Courses are offered at various skill levels with specific skill levels identified as follows:

Introductory level (intended for those with little or no previous experience in the activity).

Advanced beginning level (continued instruction and practice on basic skills).

Intermediate level (improvement of skill techniques and/or game strategy.)

Advanced level (for skilled participants with instruction to perfect techniques and sharpen competitive strategy).

#### **1A-B. Swimming (.5)**

Designed to permit students to gain or improve swimming strokes, techniques, and aquatic skills on an individual basis.

#### **1C. Swimming, Intermediate (.5)**

This course is designed to permit students to gain or improve swimming strokes, techniques, and aquatic skills on an individual basis. *Prerequisite: beginning swimming skills required.*

#### **1D. Swim Conditioning, Advanced Beginning (.5)**

Swimming for advanced beginning level swimmers who wish to utilize swimming as a physical conditioning class.

#### **1E. Swim Conditioning, Intermediate (.5)**

Swimming for intermediate level swimmers who wish to utilize swimming as a physical conditioning class.

#### **3A. Lifeguard Training (.5)**

Course meets Certification of American Red Cross Lifeguard Training requirements. Students will learn to identify and rescue a distressed or drowning victim in an aquatic environment and to recognize potential hazards associated with various types of aquatic facilities. *Prerequisites: intermediate swimming, P.E. 1C, and consent of instructor and/or complete prerequisite swim of 500 yards, swim underwater 15 yards, and tread water one minute.*

#### **3B. Advanced Lifeguard Training (.5)**

This course meets State Health Department and Emergency Medical Services approval certifications for public swimming pool lifeguards. In addition to advanced lifeguard training skills, CPR and First Aid Certifications will be awarded. Students must pass timed swim and dive tests to enter this course. *Prerequisites: Intermediate swimming, P.E. 1C, and consent of instructor.*

#### **4. Water-Safety Instruction (.5)**

Standard American Red Cross course designed to train authorized water-safety instructor to teach A.R.C. swimming and lifesaving courses thereafter. *Prerequisite: only holders of the A.R.C. Senior Lifesaving Certificate are eligible to register. Students must pass Part I in order to qualify for Part II.*

#### **6D. Advanced Open Water SCUBA Diver (.5)**

This course is designed to introduce the beginning, newly certified, inexperienced SCUBA diver to the local marine environment in a safe and enjoyable manner. It will expose the diver to the basic elements of SCUBA and the oceanic environment so that confidence and enhancement of enjoyment can be gained. *Prerequisites: recognized basic SCUBA certification, with medical approval. Student must furnish all gear.*

#### **6E. Boating SCUBA Diver (.5)**

This course envelopes the operation, care, and maintenance of a small boat, "rules of the road" in boating, knot tying and the uses of knots, and boating etiquette, as well as the SCUBA diving activities and methods while operating from a small boat. *Prerequisites: P.E. 6D/Adv. Open Water SCUBA Diver, or consent of the instructor. Student must furnish all SCUBA gear.*

#### **6F. Sea Resources SCUBA Diver (.5)**

This course exposes the SCUBA diver to the vast richness of the sea. Through the methodology of SCUBA, the student will become knowledgeable about the nearshore oceanic resources in local water and their uses by industry and the food services. *Prerequisite: P.E. 6D/Adv. Open Water SCUBA Diver. Student must furnish all SCUBA gear.*

#### **6H. Deep SCUBA Diver (.5)**

This course introduces the techniques and knowledge needed for the safe conduct of deep SCUBA divers. Decompression calculations, nitrogen narcosis, mandatory equipment, and se-

quential depth experiences are emphasized, with implementation on a weekly progression. Progressively deeper dives are accomplished by adherence to a safe sequence. *Prerequisite: P.E. 6D/Adv. Open Water SCUBA Diver. Student must furnish own gear, to include submersible watch and depth gauge.*

**6I. Research SCUBA Diver (.5)**

This course exposes SCUBA divers to methodology, techniques, gear, and sampling protocol followed by research programs in conducting underwater SCUBA operations. The setting up of a project, determination of sampling methods, recording of observations, documentation and presentation of results are discussed and thoroughly analyzed. Familiarity with gear used in marine biology, submarine geology, and physical oceanography required. *Prerequisite: P.E. 6D/Adv. Open Water SCUBA Diver, or consent of the instructor. Student must furnish all SCUBA gear.*

**6J. Search and Recovery/Night SCUBA Diver (.5)**

This course exposes the experienced SCUBA diver to working under limited visibility conditions. Methods in the conduct of search operations underwater, the recovery of items located, and multiple-person team operations will be discussed and implemented. The conditions of limited visibility, especially in zero-visibility waters and in night dive operations, will be experienced. *Prerequisite: P.E. 6D/Adv. Open Water SCUBA Diver. Student must furnish all gear, including underwater flashlight and compass.*

**7A. Skin-Diving (.5)**

Techniques of skin-diving with practical experience in the ocean environment. Introductory course will include lectures on equipment, ocean environment, and principles of skin-diving. Pool training will precede ocean experience. *Prerequisite: physically fit.*

**8E. Divemaster SCUBA Diver (.5)**

This course trains the advanced and experienced SCUBA diver in the initiation, implementation, coordination, and logistics for a group and/or class SCUBA diver. Organization both on land and in the water will be stressed, as will the responsibilities of a divemaster. Development of leadership assertiveness and assumption of responsibility will be focused on throughout the course. *Prerequisites: P.E. 6D/Adv. Open Water SCUBA Diver plus P.E. 6E, 6F, 6H, and 6J, or consent of the instructor. Student must furnish all gear, including a safe second.*

**8F. Assistant SCUBA Instructor Training (.5)**

This course develops the teaching and organization skills of the Divemaster SCUBA Diver in both classroom and water sessions. Oral presentations, practical water skills teaching, and structuring lesson units will be emphasized. The elements of methods of instruction will be discussed and applied; teaching will be structured to reach a wide scope of target audiences. *Prerequisites: P.E. 8E/Divemaster SCUBA Diver, or consent of instructor. Student must furnish all SCUBA gear.*

**10A-B-C. Surfing (Beginning, Adv. Beg., Intermediate) (.5)**

Surfing techniques taught in pool—including mounting, sitting, paddling and turning surfboard, safety techniques. After mastery of pool techniques, students surf in ocean. *Prerequisite: ability to swim 400 yards, basic lifesaving skills, and UCSD beginning swimmer's certificate.*

**12. Water Aerobics (.5)**

Physical conditioning class designed to improve cardiovascular health and fitness through a water exercise program. Course uses buoyancy effect of water to provide a safe alternative to weight-bearing activities. Students will participate in pre- and post-fitness evaluation testing.

**13A. Racquetball, Beginning (.5)**

This is an introductory course in which students will learn fundamental skills and rules. Students will learn basic serves, re-

turn of serves, forehands, backhands, court etiquette, and offensive and defensive strategies.

**13B. Racquetball, Advanced Beginning (.5)**

Continued instruction in fundamental skills, etiquette, and offensive and defensive strategies for students slightly beyond the beginning level of play. *Prerequisite: beginning racquetball or consent of instructor.*

**13C. Racquetball, Intermediate (.5)**

Intermediate racquetball is a course for those students who have taken the introductory racquetball course or have equivalent skills. Students will refine basic skills of racquetball and learn intermediate shots and strategies.

**14A. Tennis, Beginning (.5)**

Basic instruction in the serve, forehand drive, backhand drive, terminology, rules, scoring, and playing strategy for the 3-stroke game. *Prerequisite: none.*

**14B. Tennis, Advanced Beginning (.5)**

Continued instruction in the serve, forehand and backhand drives; and introduction to the volley, lob, overhead smash, and basic singles and doubles strategy. *Prerequisite: 14A or consent of instructor.*

**14C. Tennis, Intermediate Strokes (.5)**

Review of the serve, forehand and backhand drives, and concentrated instruction in the volley, lob, overhead smash, return of serve, and half-volley. *Prerequisite: 14B or consent of instructor.*

**14D. Tennis, Intermediate Strategy (.5)**

Instruction and drills in court tactics and strategy for single and doubles play utilizing all strokes, with emphasis on application in competitive play. *Prerequisite: 14C or consent of instructor.*

**14E. Tennis, Advanced (.5)**

Advanced instruction and drills in all strokes, tactics and court strategy for competitive play. *Prerequisite: 14D or consent of instructor.*

**14F. Tennis, Stroke Improvement (.5)**

Designed for students who have completed beginning and advanced beginning tennis but still have stroke deficiencies (i.e., weak or incorrect backhand drive or poor serve). The serve, backhand, and forehand drive are the three strokes to be improved or corrected.

**15A-B-C-D-E. Badminton (.5)**

Instruction in the fundamentals of the serve, strokes, volley, rules, scoring, tactics, and court strategy. Designed to allow both men and women students, novice and expert, an opportunity to participate.

**16A-B-C. Volleyball (.5)**

An emphasis on fundamental skills in serving, spiking, blocking, and teamwork techniques. Opportunity for team competition. *Prerequisite: next lower level course and consent of instructor.*

**16E-F. Volleyball—Sand, Intermediate, Advanced (.5)**

An emphasis on fundamental skills in serving, passing, spiking, blocking, and teamwork techniques. Opportunity for team competition.

**17A-C. Golf (.5)**

Instruction and practice in the fundamentals of golf. Emphasis is placed upon golf swing and techniques of using all clubs under varying conditions. Classes are offered in beginning and intermediate levels.

**27A. Aerobic Conditioning, Beginning (.5)**

A conditioning class using aerobics to improve cardiovascular performance, stamina, and overall fitness. Energetic exercise routines are done to music. Students are taught to monitor their own heart rates, and the significance of heart rate in terms of a

fitness program is explained. General fitness concepts and approaches are also discussed. Blood pressure and skinfold (body fat) measurements will also be taken.

**27C. Aerobic Conditioning, Intermediate (.5)**

A more advanced conditioning class for those who know the basics. This course will place greater emphasis on improved muscular strength and flexibility, with an increase in duration intensity and progression. *Prerequisite: "good" or "excellent" score on 12 minute run or the Lifecycle Fitness Test given by the P.E. department, or consent of instructor.*

**27E. Advanced Aerobic Conditioning (.5)**

An advanced cardiovascular conditioning class for students who have successfully completed the intermediate level skills and wish to expand and further develop their level of fitness and their knowledge of cardiovascular conditioning. *Prerequisite: P.E. 27C.*

**27F. Advanced Aerobic Conditioning—Light Weights (.5)**

A conditioning class using ankle weights (2.5 lbs.) to improve strength, flexibility, and overall fitness. Exercise routines are done to music, and they adhere to strict placement techniques and concepts. Major muscle groups are discussed, along with their functions and capabilities in exercise.

**29A. Soccer, Beginning (.5)**

Instruction in fundamentals. Skills, game strategy, and team play are scheduled. 29A = Beginning; 29B = Advanced Beginning.

**29B. Soccer, Advanced Beginning (.5)**

To enhance and to take one stage further ball skills and general knowledge of the game, i.e., heading, passing, shooting on angling plays.

**30. Softball Skills (.5)**

Course instruction will include demonstrations, drills, and supervised play. Special emphasis will be focused on fielding/batting practice, other lead-up softball/baseball exercises, and team strategies. Course activities are designed to encourage maximum participation by all, regardless of their skills level.

**31. Officiating Seminar (.5)**

Students will enhance their current officiating skills by developing a more individualized officiating style. Activities include field trips to visit professional and local amateur officials. Students will be evaluated by videotaped replay and instructor's observations.

**32A-C. Interval Running for Conditioning (.5)**

Designed to meet specific conditioning needs of each student through several different types of running such as hollow springs, interval sprints, slow and fast intervals, continuous fast running, and continuous slow running. The conditioning program will be individualized and determined by performance runs. A = Entry Level; C = Intermediate Level.

**33A-C. Conditioning, Coed (.5)**

Designed to meet individual needs of each student enrolled in class, through personal evaluation of diet, measurements, and exercise program. Students who have already taken a class in physical conditioning, weight training, or who can run one or two miles, qualify for the intermediate course. Intermediate conditioning includes cardiovascular efficiency, weight training, isometrics, circuit training, crosscountry runs, etc. (NOTE: Occasionally, classes for combined levels are offered.)

**34A-C. Weight Training (.5)**

Principles and programs of weight training and related areas of fitness including circuit training, individual weight training routines, aerobic training, posture correction exercises, and diet and nutrition for health, exercise, and weight control.



**35. Exercise, Nutrition, and Weight Control (.5)**

Theory and practice of regular exercise and nutritional needs for development, maintenance, and continuation of good health and weight control.

**36. Advanced Conditioning-Long Distance and Marathon Running (.5)**

In addition to marathon training, class lectures include individualized fitness evaluation and training schedules, injury prevention, equipment, nutrition programs, blood and obesity in health factors, and psychological preparation for long distance running. *Prerequisite: ability to run a minimum of five miles.*

**37A-B-C. Rhythmical Conditioning (.5)**

Combines vigorous rhythmical exercises with the challenge of individual choreography. The course is enhanced through a variety of musical arrangements and individually adapted for low, medium, and high levels of participation.

**38A-B-C-E. Basketball (.5)**

Instruction in fundamentals are combined with opportunities for team play. Some previous knowledge of the game is desirable since emphasis will be on vigorous competition. A = Beginning; B = Adv. Beginning; C = Intermediate; E = Advanced.

**39. Accelerated Motor Skills (.5)**

Course activities are designed to enhance the quality of student leisure time/competitive sports skills. Accelerated learning will be encouraged through group and individualized use of relaxation techniques and mental rehearsal drills.

**40A. Gymnastics/Coed/Beginning (.5)**

An introduction to the beginning student. Apparatus adjustment, safety procedures and spotting techniques are taught. Emphasis on improving all components of physical fitness with attention to upper body strength. Tumbling and progressive skills are learned.

**40C. Gymnastics/Coed/Intermediate (.5)**

To improve skills of students having fundamental knowledge of gymnastics. Begins with conditioning and review. Includes apparatus, tumbling, and trampoline. Special emphasis on safety and spotting techniques. Students will develop routines from individual skills learned.

**41. Power Walking for Conditioning (.5)**

Designed to meet specific conditioning needs of each student through several types of walking such as power walking, striding, and race walking. The program will be structured to allow students to develop their walking abilities at their own pace.

**42. Triple Fitness Conditioning (.5)**

This course is designed to attain enjoyable forms of individual levels of conditioning by participating in a combination of three aerobic activities (bicycling, swimming, running) which will provide an ultimate state of physical fitness. *Prerequisites: P.E. 1C, 1D, 33A, or 33C or consent of instructor.*

**45. Stretching/Flexibility Conditioning (.5)**

To introduce and improve flexibility, regardless of physical condition or athletic skill. This class will demonstrate and direct stretching, beginning with slow, gentle movements and continuing with conformance to individual difference in muscle tension and flexibility.

**46C. Fencing, EPEE (Electric), Intermediate (.5)**

Classical French style, brief history, electrical equipment and safety, protocol and basic technique. Attacks, both simple and compound; defenses, simple and compound; strategy and directing of bouts using French terminology. *Prerequisite: beginning foil or consent of instructor.*

**47A-C. Fencing, Foil (.5)**

Classical French style. Protocol, on guard, advance and retreat, attacks (simple and compound), parries (simple and compound), strategy, and basic rules. A = Beginning; C = Inter-

mediate. All levels of foil will not be taught each quarter. *Prerequisite: 47C requires consent of instructor or 47A.*

**48C. Fencing, Sabre (.5)**

Designed for intermediate and advanced students of fencing to continue their training in classical Hungarian sabre style fencing. (Sabre fencing may not be taught each quarter.) *Prerequisite: beginning and intermediate fencing (Foil).*

**49. Fencing, Theatrical (.5)**

Fencing techniques useful to students involved in performing arts. Emphasis will be upon choreography and dramatic presentation. *Prerequisite: fencing, (foil) beginning, (47A). Recommended: 47C.*

**50A-B-C. Karate (.5)**

Instruction and training in the fundamentals of Shotokan Karate, emphasizing: (1) basic stances and techniques; (2) "Kata," ancient stylized sequences of defensive and counter-offensive movements; (3) sparring, a graded progression from strictly controlled defense and counter-attack situations to free sparring for competition.

**51A-C-D. Cycling (.5-.5-.5)**

The wonderful world of the bicycle builds the exercise habit into daily routines. Proper riding techniques, care, maintenance, and safety considerations add up to extra thrills of exploring backroads, byways, and paths in a fifty-mile radius of campus or overnight trips for the advanced cyclist.

**54A. First Aid (.5)**

Standard first aid and personal safety course. Prepares the student to render life support first aid prior to making arrangements for transportation of victims. Training includes treatment of wounds, burns, poisoning, fractures, CPR, bandaging, splinting, heat and cold emergencies.

**59A. Applied Rehabilitation for Post Muscle and Joint Trauma (.5)**

For students with muscle and joint trauma who need specific information and instruction concerning the nature of tissue injury and a rehabilitation program, and to give the student preventive measures useful in avoiding further injury. *Prerequisite: referral of attending physician.*

**59G. Physical Activity for the Disabled Student (.5)**

Class activities designed to involve disabled students in a variety of individualized physical activities, modified sports and calisthenics; students will be encouraged to follow an individualized conditioning program as well as develop greater self-confidence.

**59T. Athletic Training (.5)**

Study and practice of athletic training techniques and emergency field care of athletic injuries. Presentation will include theory and techniques of basic athletic injury prevention, recognition, immediate treatment, emergency procedures, bandaging, and taping.

**100. Fitness and Wellness for Life; Principles and Labs (2)**

To provide students with the information to implement a life-time fitness program. Acquisition of knowledge is the focus, so the student may make appropriate personal choices in the areas of cardiovascular activities, strengthening programs, flexibility exercises, stress management techniques, and dietary habits.

■ **P.E. MINOR COURSES**

**81. Introduction to Physical Education (2)**

An introduction to historical, biochemical, physiological, psychological, and sociological foundations of physical education.

**84. Anatomy/Kinesiology (4)**

Study of anatomical and mechanical fundamentals of human motion. Qualitative and quantitative application of kinesiological principles to a variety of movement situations.

**120. Sports in America (4)**

This class will study and analyze the institution of sport in American life from a sociological perspective (i.e., social structure and processes) and focus on the reciprocal linkages of sport with other institutions such as politics, economics, education, and religion. *Prerequisites: Sociology 1A-1B.*

**121. The Black Athlete (4)**

This class will study and analyze the role of the black athlete in the institution of sports in American life from a sociological perspective (i.e., social structure and processes) with a brief social history from 1777 to the present.

**160. Exercise Physiology (4)**

The effects of exercise on the cardiovascular, respiratory, neuromuscular, and metabolic systems will be studied from the perspective of human physiology. Introductory laboratory techniques and procedures will be undertaken. Field trips to V.A., Scripps, and UCSD Medical Center. *Prerequisites: lower-division chemistry and biology.*

**160L. Exercise Physiology Lab (2)**

Having gained a theoretical background in P.E. 160, the students will apply the theoretical principles to laboratory experiences. Laboratory instruction in stress testing techniques and protocol, pulmonary function testing, exercise electrocardiography, specific bioassays to determine energy metabolism, and analytical electromyography will be taught. *Prerequisite: P.E. 160.*

**170. Psychological Basis of Sport and Physical Activity (4)**

This course is a survey of human performance theory, learning and sport psychology as applied to the sport and physical activity domain. Specific topics include input, decision and effector mechanisms; memory and schema theory in learning motor skills; personality and sport participation and performance. *Prerequisite: introductory psychology.*

**195. Teaching Assistant in Academic P.E. Minor (1-4)**

Introduction to the teaching of a lower-division academic course in the P.E. minor curriculum. Under the direction of the instructor, the student will assist as "teaching assistant." Weekly meetings with instructor, written reports on methods and materials required. *Prerequisite: consent of instructor. Student must have completed specific course with a B grade or better or have completed the course with a pass grade.*

**199. Special Studies (1-4)**

Supervised independent study and research in P.E. topics which are continuations of topics covered in physical fitness and health promotion minor. Student must be upper-division and in good standing (2.5 GPA). (Each individual proposal must be approved by CEP Subcommittee on Undergraduate Courses.) *Prerequisites: completion of courses in physical fitness and health promotion minor, consent of instructor, and approval of CEP Subcommittee on Undergraduate Courses.*

■ **PHYSICAL EDUCATION/TEACHER EDUCATION**

**133. Fitness for Future Teachers (4)**

A lab/lecture course presenting resource ideas, in fitness, for future elementary teachers. Students in this course will learn the principles of fitness and how to apply these principles to develop activity programs for children and for themselves.

■ **INTERCOLLEGIATE ATHLETICS**

Students participating in intercollegiate athletic teams may enroll in courses associated with the individual sports (some courses offer .5 credit). Teams may be men's, women's, or coed. Contact the Intercollegiate Athletics Office (534-4211).



**P** HYSICS

OFFICES:

General Administration: 1060-113 Urey Hall Addition, Revelle College

Graduate Student Affairs: 1060-121 Urey Hall Addition

Undergraduate Student Affairs: 1060-115 Urey Hall Addition

Chair's Office: 1060-113 Urey Hall Addition

**Professors**

- Henry D. I. Abarbanel, Ph.D.
- Ami E. Berkowitz, Ph.D., *CMRR Endowed Chair*
- James G. Branson, Ph.D.
- Keith A. Brueckner, Ph.D., *Emeritus*
- E. Margaret Burbidge, Ph.D., *Emeritus, Astronomy*
- Geoffrey R. Burbidge, Ph.D.
- Joseph C. Y. Chen, Ph.D.
- Roger Dashen, Ph.D., *Chair*
- Patrick H. Diamond, Ph.D.
- Robert C. Dynes, Ph.D.
- George Feher, Ph.D.
- Zachary Fisk, Ph.D.
- Donald R. Fredkin, Ph.D.
- John M. Goodkind, Ph.D.
- Robert J. Gould, Ph.D.
- Francis R. Halpern, Ph.D., *Emeritus*
- Jorge E. Hirsch, Ph.D.
- Norman M. Kroll, Ph.D., *Emeritus*
- Julius Kuti, Ph.D.
- Herbert Levine, Ph.D.
- Leonard N. Liebermann, Ph.D., *Emeritus*
- Ralph H. Lovberg, Ph.D., *Emeritus*
- John H. Malmberg, Ph.D., *Emeritus*
- Aneesh Manohar, Ph.D.
- M. Brian Maple, Ph.D., *Bernd T. Matthias Endowed Chair*
- George E. Masek, Ph.D.
- Carl E. McIlwain, Ph.D.
- Maurice Montal, M.D., Ph.D.
- Melvin Y. Okamura, Ph.D.
- Thomas M. O'Neil, Ph.D., *Vice Chair, Education*
- Hans P. Paar, Ph.D.
- Laurence E. Peterson, Ph.D.
- Oreste Piccioni, Ph.D., *Emeritus*
- Sally K. Ride, Ph.D.
- Marshall N. Rosenbluth, Ph.D.
- Ivan K. Schuller, Ph.D.
- Sheldon Schultz, Ph.D.
- Lu Jeu Sham, Ph.D.
- Harding E. Smith, Ph.D.
- Harry Suhl, Ph.D., *Emeritus*
- Clifford M. Surko, Ph.D.
- Robert A. Swanson, Ph.D., *Emeritus*
- William B. Thompson, Ph.D., *Emeritus*
- Harold Ticho, Ph.D., *Emeritus*

- Wayne Vernon, Ph.D.
- Arthur M. Wolfe, Ph.D.
- David Y. Wong, Ph.D., *Provost, Warren College*
- Nguyen-Huu Xuong, Ph.D.
- Herbert F. York, Ph.D., *Emeritus*

**Associate Professors**

- George M. Fuller, Ph.D.
- Barbara Jones, Ph.D.
- Oscar Lumpkin, Ph.D.
- David R. Tytler, Ph.D.

**Assistant Professors**

- Daniel P. Arovas, Ph.D.
- Daniel H. E. Dubin, Ph.D.
- Frances Hellman, Ph.D.
- David B. Kaplan, Ph.D.
- Ann E. Nelson, Ph.D.
- Jose N. Onuchic, Ph.D.

**Adjunct Professors**

- Edward C. Creutz, Ph.D.
- Alan M. Eisner, Ph.D.
- Edward A. Frieman, Ph.D.
- John M. Greene, Ph.D.
- Roy H. Neynaber, Ph.D.
- Tihiro Ohkawa, Ph.D.
- Philip M. Platzman, Ph.D.
- Terrence J. Sejnowski, Ph.D.
- Ronald E. Waltz, Ph.D.

The Department of Physics was established in 1960 as the first new department of the UCSD campus. Since then it has developed a strong faculty and student body with unusually diversified interests which lie primarily in the following areas:

1. Physics of elementary particles
2. Quantum liquids and superconductivity
3. Solid state and statistical physics
4. Plasma physics
5. Astrophysics and space physics
6. Atomic and molecular collision and structure
7. Biophysics
8. Geophysics
9. Nonlinear dynamics

In addition to on-campus research facilities, the high energy program uses accelerators at SLAC, CERN, Cornell, and Fermi Laboratory. The astrophysics program uses facilities at Keck, Lick, Mt. Lemmon, and Kitt Peak Observatories.

**THE UNDERGRADUATE PROGRAM**

The Department of Physics offers undergraduate programs leading to the following degrees:

- B.S. in physics
- B.S. in physics with specialization in biophysics
- B.S. in physics with specialization in biophysics-premedical
- B.S. in physics with specialization in earth sciences

A grade-point average of 2.0 or higher in the upper-division major program is required for graduation. Students must receive a grade of C- or better in any course to be counted toward fulfillment of the major requirements. In exceptional cases, students with a grade-point average in the major of 2.5 or greater may petition to have one grade of D accepted. All courses (lower and upper division) required for the major must be taken for a letter grade.

**PHYSICS MAJOR**

The upper-division program for physics majors is intended to provide basic education in several principal areas of physics, with some opportunity for study in neighboring areas in the form of restricted electives. Provision is made, both in the main courses and in the elective subjects, for some training in a few of the more technological aspects of physics.

In the junior year, the emphasis is on macroscopic physics; the two principal physics subjects are electromagnetism and mechanics. The mathematics background required for the physics program is completed in this year.

In the senior year, a sequence of courses in quantum physics provides the student the modern view of atomic and some aspects of subatomic physics and the principal analytical methods appropriate in this domain. The relation of the microscopic to the macroscopic world is the subject of courses in thermodynamics and statistical physics, with illustrations drawn from gas dynamics and solid-state physics. The quantum physics sequence aims at an integrated, descriptive, and analytical treatment of those areas of physics in which quantum effects are important, particularly atomic and nuclear physics and elementary particle physics.

Students may wish to incorporate a small portion of the major program into their lower-division studies, for example, Physics 105 and Mathematics 110.

The following courses are required for the physics major:

**Lower Division**

1. Physics 4A-B-C-D-E and 2CL-DL.
2. Chemistry 6A or 7A (Chemistry 7A is strongly recommended).
3. Mathematics 2DA-EA-F or 2DH-EH-FH.

**Upper Division**

1. Physics 100A-B-C, 105, 110A-B, 120A-B, 130A-B, 140A-B, and two additional laboratory courses from the following group: 121, 131, 132, 133, or 199 with departmental approval.
2. Mathematics 110.
3. Restricted Electives: Three upper-division (four-unit) or graduate courses in natural sciences or mathematics, subject to departmental approval. For students who do not minor in mathematics, one of these electives must be in mathematics (Math. 120A recommended).

**Suggested Schedule**

FALL	WINTER	SPRING
<b>JUNIOR YEAR</b>		
Phys. 100A	Phys. 100B	Phys. 100C
Phys. 105	Phys. 110B	Phys. 120B
Phys. 110A	Phys. 120A	Restr. Elec.
Math. 110		
<b>SENIOR YEAR</b>		
Phys. 130A	Phys. 130B	Restr. Elec.
Phys. 140A	Phys. 140B	(Phys. 132 or 133)
Restr. Elec.	(Phys. 121 or 131)	

**PHYSICS MAJOR WITH SPECIALIZATION IN BIOPHYSICS**

The upper-division program for physics majors with specialization in biophysics is essentially the same as the standard physics major with some modification to provide the education in biology and chemistry needed for advanced work in biophysics. Students entering the program with backgrounds deficient in mathematics or chemistry will be required to remedy the deficiency in their junior year. The consequent rearrangement of the upper-division program will be devised by consultation between the student and the physics departmental adviser for biophysics.

Students may wish to incorporate a small portion of the major program into their lower-division studies, for example, Physics 105 and Mathematics 110.

The following courses are required for the physics major with specialization in biophysics:

**Lower Division**

1. Physics 4A-B-C-D-E and 2CL-DL; or Physics 2A-B-C-D and 2CL-DL (Physics 4 sequence is strongly recommended).
2. Chemistry 6A-B-C or 7A-B, and 6BL-CL.
3. Biology 1.
4. Mathematics 2DA-EA-F or 2DH-EH-FH.

**Upper Division**

1. Physics 100A-B-C, 105, 110A, 120A-B, 130A-B, 153.
2. Chemistry 131, 140A-B, 143A.
3. Biology 101, 103, 106, 111, 131.
4. Mathematics 110.

**Suggested Schedule**

FALL	WINTER	SPRING
<b>JUNIOR YEAR</b>		
Phys. 100A	Phys. 100B	Phys. 100C
Phys. 105	Phys. 120A	Phys. 120B
Phys. 110A	Chem. 140B	Chem. 143A
Chem. 140A		
<b>SENIOR YEAR</b>		
Phys. 130A	Phys. 130B	Phys. 153
Biol. 101	Chem. 131	Biol. 103
Biol. 131	Biol. 106	Biol. 111

**PHYSICS MAJOR WITH SPECIALIZATION IN BIOPHYSICS-PREMEDICAL**

The upper-division program for physics majors with specialization in biophysics-premedical is essentially the same as the standard physics major with some modification to provide the education in biology and chemistry needed for the study of medicine. Students entering the program with backgrounds deficient in mathematics or chemistry will be required to remedy the deficiency in their junior year. The consequent rearrangement of the upper-division program will be devised by consultation between the student and the departmental adviser for biophysics.

Students may wish to incorporate a small portion of the major program into their lower-division studies, for example, Physics 105 and Mathematics 110.

The following courses are required for the physics major with specialization in biophysics-premedical:

**Lower Division**

1. Physics 4A-B-C-D-E and 2CL-DL; or Physics 2A-B-C-D and 2CL-DL (Physics 4 sequence is strongly recommended).
2. Chemistry 6A-B-C or 7A-B, and 6BL-CL.
3. Biology 1.
4. Mathematics 2DA-EA-F or 2DH-EH-FH.

**Upper Division**

1. Physics 100A-B-C, 105, 110A, 120A-B, 130A, 153.
2. Chemistry 126 or 131, 140A-B, 143A.
3. Biology 101, 106, 111, 131.
4. Mathematics 110.
5. Restricted Elective: one biology course (Biology 121, 122, or 125).

**Suggested Schedule**

FALL	WINTER	SPRING
<b>JUNIOR YEAR</b>		
Phys. 100A	Phys. 100B	Phys. 100C
Phys. 105	Phys. 120A	Phys. 120B
Phys. 110A	Chem. 140B	Chem. 143A
Chem. 140A		Math. 110
<b>SENIOR YEAR</b>		
Phys. 130A	Chem. 126 or 131	Phys. 153
Biol. 101	Biol. 106	Restr. Elec.
Biol. 131		Biol. 111

**PHYSICS MAJOR WITH SPECIALIZATION IN EARTH SCIENCES**

The upper-division program for physics majors with specialization in earth sciences is essentially the same as the standard physics major augmented by courses in earth sciences.

Students may wish to incorporate a small portion of the major program into their lower-division studies, for example, Earth Sciences 101, Physics 105, and Mathematics 110.

The following courses are required for the physics major with specialization in earth sciences:

**Lower Division**

1. Physics 4A-B-C-D-E and 2CL-DL; or Physics 2A-B-C-D and 2CL-DL (Physics 4 sequence is strongly recommended).
2. Chemistry 6A-B or 7A-B, and 6BL.
3. Mathematics 2DA-EA-F or 2DH-EH-FH.

**Upper Division**

1. Physics 100A-B-C, 105, 110A-B, 120A-B, 130A, 140A-B.
2. Earth Science 102, 103, 120.
3. Mathematics 110.
4. Restricted Electives: three upper-division (four-unit) or graduate courses to be chosen with the approval of the SIO earth sciences adviser.

**Suggested Schedule**

FALL	WINTER	SPRING
<b>JUNIOR YEAR</b>		
Phys. 100A	Phys. 100B	Phys. 100C
Phys. 105	Phys. 110B	Phys. 120B
Phys. 110A	Phys. 120A	ES 102
ES 101	ES 103	Math. 110
<b>SENIOR YEAR</b>		
Phys. 130A	Restr. Elec.	Restr. Elec.
Phys. 140A	Phys. 140B	Restr. Elec.
	ES 120	

**ENGINEERING PHYSICS PROGRAM**

The engineering physics program is offered jointly by the Departments of Physics, AMES,

## PHYSICS

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and ECE, and is administered by the Department of ECE. (See "ECE, Engineering Physics Program.")

### TRANSFER STUDENTS

Students who have had prior course work in the major at other institutions should consult with the Department of Physics, Undergraduate Student Affairs Office, 1060-115 Urey Hall Addition.

### MINOR IN PHYSICS

Students may arrange minor programs or programs of concentration in physics by consulting with the Department of Physics, Undergraduate Student Affairs Office, 1060-115 Urey Hall Addition.

### SECONDARY SCHOOL PHYSICS TEACHING

A physics major offers excellent preparation for teaching science in the secondary schools. If you are interested in earning a California teaching credential from UCSD, contact the Teacher Education Program for information about the prerequisite and professional preparation requirements. It is recommended that you contact TEP as early as possible in your academic career.

### ADVISING OFFICE

Detailed information may be obtained from the Department of Physics, Undergraduate Student Affairs Office, 1060-115 Urey Hall Addition (619) 534-3290.

### THE GRADUATE PROGRAM

The Department of Physics offers curricula leading to the following degrees:

- M.S. in physics
- C.Phil. in physics
- C.Phil. in physics (biophysics)
- Ph.D. in physics
- Ph.D. in physics (biophysics)

Entering graduate students are required to have a sound knowledge of undergraduate mechanics, electricity and magnetism; to have had senior courses or their equivalent in atomic and quantum physics, nuclear physics, and thermodynamics; and to have taken upper-division laboratory work. An introductory course in solid-state physics is desirable.

### MASTER'S DEGREE PROGRAM

Requirements for the master of science degree can be met according to Plan II (comprehensive

examination). (See "Graduate Studies: The Master's Degree.") The comprehensive examination is identical to the first-year written examination for Ph.D. students. A list of acceptable courses is available in the Department of Physics Graduate Student Affairs office. There is no foreign language requirement.

### DOCTORAL DEGREE PROGRAM

The department has developed a flexible Ph.D. program which provides a broad, advanced education in physics while at the same time giving students opportunity for emphasizing their special interests. This program consists of graduate courses, apprenticeship in research, teaching experience, and thesis research.

Entering students are assigned a faculty adviser to guide them in their program. Many students spend their first year as teaching assistants or fellows and begin apprentice research in their second year. When a student's association with a research area and research supervisor is well established, a faculty research progress committee is formed with the responsibility of conducting an annual review of progress and, at the appropriate time, initiating the formation of a doctoral committee. After three years of graduate study, or earlier, students complete the departmental examinations and begin thesis research. Students specializing in biophysics make up deficiencies in biology and chemistry during the first two years and complete the departmental examinations by the end of their third year of graduate study. There is no foreign language requirement.

### ENTRANCE TESTING

An entrance test covering undergraduate physics is given to entering graduate students during registration week for the purpose of enabling the faculty to give them better guidance in their graduate work. Performance on this test has no bearing on the students' status in graduate school.

### REQUIREMENTS FOR THE PH.D.

Students are required to pass a written examination, advanced graduate courses, an oral topic examination, a qualifying examination, and a final defense of the thesis as described below.

#### 1. Departmental Written Examination

Physics students are required to take a written examination after completing one year of graduate work at UCSD. The examination is on the level of material usually covered in upper-division courses and the graduate courses listed below:

#### Fall

Phys. 200A (Theoretical Mechanics)  
Phys. 201 (Mathematical Physics)  
Phys. 212A (Quantum Mechanics)

#### Winter

Phys. 200B (Theoretical Mechanics)  
Phys. 203A (Adv. Classical Electrodynamics)  
Phys. 212B (Quantum Mechanics)

#### Spring

Phys. 203B (Adv. Classical Electrodynamics)  
Phys. 210A (Equilibrium Statistical Mechanics)  
Phys. 212C (Quantum Mechanics)

The examination is offered twice a year, at the beginning of the fall and spring quarters, and lasts two days, four hours per day. The examination may be repeated once, the next time it is offered.

Biophysics students take the written examination after completing two years of graduate work.

#### 2. Advanced Graduate Courses

Physics students are required to take six advanced graduate courses, selected from *at least three of the groups* listed below, no later than the end of the third year of graduate work. A 3.0 average in five of the six courses is required. (In lieu of the course requirement, students may petition to take an oral examination covering three areas of physics.)

**Group 1:** Physics 218A, 218B, 218C (Plasma); 221 (Adv. Mech.); 234 (Nonneutral Plas.); 235 (Nonlin. Plas. Th.)

**Group 2:** Physics 210B (Nonequil. Stat. Mech.); 211A, 211B (Solid State); 230 (Adv. Solid State); 236 (Many-body Th.)

**Group 3:** Physics 214 (Elem. Part.); 215A, 215B, 215C (Part. & Fields); 217A, 217B (Renorm. Field Th.); 233 (Adv. Elem. Part. Th.)

**Group 4:** Physics 220 (Group Th.); Math. 210A, 210B, 210C (Math. Phys.); Math. 259A, 259B, 259C (Geom. Phys.)

**Group 5:** Physics 206 (Biophys.); 213A, 213B (Nuc.); 216 (Atomic); 225A, 225B (Relativ.); 231 (Collision Th.)

**Group 6:** Physics 223 (Stel. Str.); 224 (Intrstel. Med.); 226 (Gal. & Gal. Dyn.); 227 (Cosmology), 228 (HE Astro. & Comp. Obj.)

Biophysics students select six courses from biology, biochemistry, chemistry, or physics in consultation with their adviser. At least three courses must be graduate courses.

#### 3. Oral Topic Examination

Physics students are required to take an oral topic examination at the beginning of the third year of graduate work. Three topics of current interest in physics or biophysics are announced

two weeks prior to the examination week, and a list of relevant references is supplied. Students select one of the topics and present a one-half hour talk on it to a faculty examination committee. The oral presentation is followed by approximately one hour of questioning generally related to the topic. This examination is offered twice a year, at the beginning of the fall and spring quarters, and may be repeated once, the next time it is offered.

Biophysics students take this examination no later than the spring of the third year of graduate work.

#### 4. Qualifying Examination and Advancement to Candidacy

In order to be advanced to candidacy, students must have met the departmental requirements and obtained a faculty research supervisor. At the time of application for advancement to candidacy, a doctoral committee responsible for the remainder of the student's graduate program is appointed by the Graduate Council. The committee conducts the Ph.D. qualifying examination during which students must demonstrate the ability to engage in thesis research. Usually this involves the presentation of a plan for the thesis research project. The committee may ask questions directly or indirectly related to the project and questions on general physics which it determines to be relevant. Upon successful completion of this examination, students are advanced to candidacy and are awarded the C.Phil. degree.

#### 5. Teaching Requirement

All students are expected to participate in the physics undergraduate teaching program. After passing the departmental examinations and course requirements and before completing a dissertation, students are required to take a total of no fewer than two units of Physics 500 (Physics Instruction). Each unit corresponds to approximately five hours per week for one quarter in laboratory sections, recitation sections, or problem sessions. (This requirement may be waived in special cases by the vice chair, education.)

#### 6. Thesis Defense

When students have completed their theses, they are asked to present and defend them before their doctoral committees.

#### Time Limits for Progress to the Ph.D.

In accordance with university policy, the Department of Physics has established the following time limits for progress to the Ph.D. A student's research progress committee helps ensure that these time limits are met.

	Theorists	Experimentalists
Advancement to Candidacy	4 years	5 years
Total Registered Time and Support	7 years	8 years

### DEPARTMENTAL COLLOQUIUM

The department offers a weekly colloquium on topics of current interest in physics and on departmental research programs. Students are expected to register for and attend the colloquium.

### SUPPLEMENTARY COURSE WORK AND SEMINARS

The department offers regular seminars in several areas of current interest. Students are strongly urged to enroll for credit in seminars related to their research interests and, when appropriate, to enroll in advanced graduate courses beyond the departmental requirement. To help beginning students choose a research area and a research supervisor, the department offers a special seminar (Physics 261) that surveys physics research at UCSD.

### COURSE CREDIT BY EXAMINATION

Students have an option of obtaining credit for a physics graduate course by taking the final examination without participating in any class exercises. They must, however, officially register for the course and notify the instructor and the Department of Physics graduate student affairs office of their intention no later than the first week of the course.

## Courses

### LOWER DIVISION

The lower-division courses are usually offered in the quarters indicated below:

FALL	WINTER	SPRING
Phys. 1A	Phys. 1A	Phys. 1B
Phys. 1B	Phys. 1B	Phys. 1C
Phys. 1C	Phys. 1C	Phys. 1CL
Phys. 1CL	Phys. 1CL	Phys. 2AS
Phys. 2A	Phys. 2A	Phys. 2B
Phys. 2BL	Phys. 2B	Phys. 2BL
Phys. 2BS	Phys. 2BS	Phys. 2C
Phys. 2C	Phys. 2BL	Phys. 2CL
Phys. 2CS	Phys. 2CL	Phys. 2CS
Phys. 2CL	Phys. 2CS	Phys. 2DL
Phys. 2D	Phys. 2D	Phys. 4B
Phys. 2DL	Phys. 4A	Phys. 4E
Phys. 4C	Phys. 4D	Phys. 5
Phys. 5	Phys. 6	Phys. 10
Phys. 10		

The Physics 1 sequence is acceptable for biology and chemistry majors.

The Physics 2 sequence is intended for physical science and engineering majors and those biological science majors with strong mathematical aptitude.

The Physics 4 sequence is intended for all physics majors and for students with a serious interest in physics. This five-quarter sequence is not an honors sequence; it covers the same topics as the Physics 2 sequence, but it covers these topics more slowly and in more depth. The Physics 4 sequence provides a solid foundation for the upper-division courses required for the physics major.

#### 1A. General Physics—Mechanics (4)

A calculus-based introductory physics course covering vectors, equilibrium of a particle, motion on a straight line, Newton's second law and gravitation, motion in a plane, work and energy, impulse and momentum, equilibrium of a rigid body, rotation, periodic motion and temperature, thermodynamics and the thermal properties of matter. *Prerequisites: Math. 1A and concurrent enrollment in Math. 1B; or concurrent enrollment in Math. 2A or 2AH. (FW)*

#### 1B. General Physics—Electricity and Magnetism (4)

Continuation of Physics 1A covering fluid statics and dynamics, Coulomb's law, Gauss's law, potential, capacitance, current, resistance and electromotive force, direct-current circuit and instruments, the magnetic field, magnetic forces on current-carrying conductors, magnetic field of a current, induced electromotive force, inductance, magnetic properties of matter and alternating currents. *Prerequisites: Phys. 1A and concurrent enrollment in Math. 1C or Math. 2B or 2BH. (F,W,S)*

#### 1C. General Physics—Waves, Optics, Relativity, and Quantum Physics (4)

Continuation of Physics 1B covering traveling waves, electromagnetic waves, the nature and propagation of light, geometric optics, interference and diffraction, relativistic mechanics, photons, electrons and atoms, quantum mechanics, atoms, molecules and solids, nuclear physics. *Prerequisites: Phys. 1B and Math. 1C or Math. 2B. (F,W,S)*

#### 1CL. General Physics Laboratory—Electricity and Magnetism and Optics (1)

Four three-hour laboratories covering the cathode ray oscilloscope and wave generator, the R-C circuit, lenses and the eye, and optical spectra and the diffraction grating. *Prerequisites: Phys. 1B, and prior or concurrent enrollment in Phys. 1C. (F,W,S)*

#### 2A. Physics—Mechanics (4)

A calculus-based science-engineering general physics course covering vectors, motion in one and two dimensions, Newton's first and second laws, work and energy, conservation of energy, linear momentum, collisions, rotational kinematics, rotational dynamics, equilibrium of rigid bodies, oscillations, gravitation. *Prerequisites: Math. 2A or 2AH, and concurrent enrollment in Math. 2B or 2BH. (FW)*

#### 2AS. Physics—Mechanics (4)

Same as Physics 2A except that it is offered as a self-paced (Keller plan) course. *Prerequisites: Math. 2A or 2AH and concurrent enrollment in Math. 2B or 2BH. (S)*

#### 2B. Physics—Electricity and Magnetism (4)

Continuation of Physics 2A covering charge and matter, the electric field, Gauss's law, electric potential, capacitors and dielectrics, current and resistance, electromotive force and circuits, the magnetic field, Ampere's law, Faraday's law, induc-

tance, electromagnetic oscillations, alternating currents and Maxwell's equations. *Prerequisites: Phys. 2A, Math. 2B or 2BH, and concurrent enrollment in Math. 2C or 2CH.* (W,S)

**2BL. Physics Laboratory—Mechanics and Electrostatics (2)**

One hour lecture and three hours' laboratory. Experiments include gravitational force, linear and rotational motion, conservation of energy and momentum, collisions, oscillations and springs, gyroscopes. Experiments on electrostatics involve charge, electric field, potential, and capacitance. Data reduction and error analysis are required for written laboratory reports. *Prerequisite: concurrent enrollment in Phys. 2B, 2BS, or 4C.* (F,W,S)

**2BS. Physics—Electricity and Magnetism (4)**

Same as Physics 2B, except that it is offered as a self-paced (Keller plan) course. *Prerequisites: Phys. 2A, Math. 2B or 2BH, and concurrent enrollment in Math. 2C or 2CH.* (F,W)

**2C. Physics—Fluids, Waves, Thermodynamics, and Optics (4)**

Continuation of Physics 2B covering fluid mechanics, waves in elastic media, sound waves, temperature, heat and the first law of thermodynamics, kinetic theory of gases, entropy and the second law of thermodynamics, Maxwell's equations, electromagnetic waves, geometric optics, interference and diffraction. *Prerequisites: Phys. 2B, Math. 2C or 2CH, and concurrent enrollment in Math. 2DA or 2DH.* (F,S)

**2CS. Physics—Fluids, Waves, Thermodynamics, and Optics (4)**

Same as Physics 2C, except that it is offered as a self-paced (Keller plan) course. *Prerequisites: Phys. 2B, Math. 2C or 2CH, and concurrent enrollment in Math. 2DA or 2DH.* (F,W,S)

**2CL. Physics Laboratory—Electricity and Magnetism, Waves, Optics (2)**

One hour lecture and three hours' laboratory. Experiments to be chosen from refraction and interference using a laser, refraction, interference and diffraction of microwaves, lenses and the eye, acoustic resonance, the cathode ray oscilloscope and R-C circuits, LRC circuits, oscillations and damping, resonance and damping, measurement of magnetic fields, and the mechanical equivalence of heat. *Prerequisite: prior or concurrent enrollment in Phys. 2C, 2CS, or 4D.* (F,W,S)

**2D. Physics—Relativity and Quantum Physics (4)**

A modern physics course covering atomic view of matter, electricity and radiation, atomic models of Rutherford and Bohr, relativity, X-rays, wave and particle duality, matter waves, Schrödinger's equation, atomic view of solids, natural radioactivity. *Prerequisites: Phys. 2B and Math. 2DA or 2DH.* (F,W)

**2DS. Physics—Relativity and Quantum Physics (4)**

Same as Physics 2D except that it is offered as a self-paced (Keller plan) course. *Prerequisites: Phys. 2B and Math. 2DA or 2DH.* (Not offered in 1992-93, except in Summer Session.)

**2DL. Physics Laboratory—Modern Physics (2)**

One hour of lecture and three hours of laboratory. Experiments to be chosen from refraction, diffraction and interference of microwaves, Hall effect, thermal band gap, optical spectra, coherence of light, photoelectric effect, e/m ratio of particles, radioactive decays, and plasma physics. *Prerequisites: 2BL or 2CL, prior or concurrent enrollment in Phys. 2D, 2DS, or 4E.* (F,W,S)

**4A. Physics for Physics Majors—Mechanics (4)**

The first quarter of a five-quarter calculus-based physics sequence for physics majors and students with a serious interest in physics. The topics covered are vectors, particle kinematics and dynamics, work and energy, conservation of energy, conservation of momentum, collisions, rotational kinematics and dynamics, equilibrium of rigid bodies. *Prerequisites: Math. 2A or 2AH and concurrent enrollment in Math. 2B or 2BH.* (W)

**4B. Physics for Physics Majors—Mechanics, Fluids, Waves, and Heat (4)**

Continuation of Physics 4A covering oscillations, gravity, fluid statics and dynamics, waves in elastic media, sound waves, heat and the first law of thermodynamics, kinetic theory of gases, second law of thermodynamics, gaseous mixtures and chemical reactions. *Prerequisites: Phys. 4A, Math. 2B or 2BH and concurrent enrollment in Math. 2C or 2CH.* (S)

**4C. Physics for Physics Majors—Electricity and Magnetism (4)**

Continuation of Physics 4B covering charge and Coulomb's law, electric field, Gauss's law, electric potential, capacitors and dielectrics, current and resistance, magnetic field, Ampere's law, Faraday's law, inductance, magnetic properties of matter, LRC circuits, Maxwell's equations. *Prerequisites: Phys. 4B, Math. 2C or 2CH and concurrent enrollment in Math. 2DA or 2DH.* (F)

**4D. Physics for Physics Majors—Electromagnetic Waves, Optics, and Special Relativity (4)**

Continuation of Physics 4C covering electromagnetic waves and the nature of light, cavities and wave guides, electromagnetic radiation, reflection and refraction with applications to geometrical optics, interference, diffraction, holography, special relativity. *Prerequisites: Phys. 4C, Math. 2DA or 2DH and concurrent enrollment in Math. 2EA or 2EH.* (W)

**4E. Physics for Physics Majors—Quantum Physics (4)**

Continuation of Physics 4D covering experimental basis of quantum mechanics: Schrödinger equation and simple applications; spin; structure of atoms and molecules; selected topics from solid state, nuclear, and elementary particle physics. *Prerequisites: Phys. 4D, Math. 2EA or 2EH, and concurrent enrollment in Math. 2F or 2FH.* (S)

**5. The Universe (4)**

Descriptive (non-mathematical) introduction to modern astronomy with emphasis on the physical principles that govern the universe and its observed nature. Topics include the earth's place in the universe; the atom and light; the birth, life, and death of the sun and other stars; the Milky Way galaxy; normal and active galaxies; and cosmology. Physics 5, Earth Sciences 1 (The Oceans), and Earth Sciences 4 (The Nature of the Earth) form a three-quarter sequence for general interest in science. Physics 5 satisfies the Third College physics requirement and is accepted for general science credit in Warren College. (F,S)

**6. Physics of Space Science and Exploration (4)**

Descriptive introduction to basic physics concepts relevant to space science and exploration. Topics include gravity; orbits, weightlessness, and Kepler's laws; the Earth's physical environment (including its atmosphere, its magnetic field, and radiation from the sun); and light as an electromagnetic wave. These topics form the basis for an introduction to the space program and discussion of the scientific reasons for performing experiments or observations in space. (W)

**10. Concepts in Physics (4)**

This is a one-quarter general physics course for nonscience majors. Topics covered are motion, energy, heat, waves, electric current, radiation, light, atoms and molecules, nuclear fission and fusion. This course emphasizes concepts with minimal mathematical formulation. *Prerequisites: college algebra (community college Math. 140) or equivalent.* (F,S)

**11. Introduction to General Physics (4)**

This course is designed to introduce potential science majors to concepts in physics and to prepare them for further sequences in the sophomore year. Topics include kinematics, dynamics, energy momentum, and thermodynamics. Emphasis will be on problem solving. *Prerequisite: Math. 1A or 2A (or concurrent enrollment).* (Not offered in 1992-93.) (S)

**90. Undergraduate Seminar—Physics Today (1)**

Undergraduate seminars organized around the research interests of various faculty members. *Prerequisites: none.* (F,W,S)

UPPER DIVISION

(See also course listings: "Frontiers of Science.")

**100A. Electromagnetism (4)**

Coulomb's law, electric fields, electrostatics; conductors and dielectrics; steady currents, elements of circuit theory. Four hours' lecture. *Prerequisites: Phys. 2C or 4D, Math. 2DA-2EA-F or 2DH-EH-FH.* (F)

**100B. Electromagnetism (4)**

Magnetic fields and magnetostatics, magnetic materials, induction, AC circuits, displacement currents; development of Maxwell's equations. Three hours' lecture. *Prerequisites: Phys. 100A, 105.* (W)

**100C. Electromagnetism (4)**

Electromagnetic waves, radiation theory; application to optics; motion of charged particles in electromagnetic fields; relation of electromagnetism to relativistic concepts. Four hours' lecture. *Prerequisites: Phys. 100B, 105.* (S)

**105. Computational Physics (4)**

A laboratory-lecture course on practical computer programming. Topics include a review of Fortran, numerical methods, Monte-Carlo techniques, and the use of graphics to interpret results. Some previous experience with computer programming is expected. (Note: Students may not receive credit for both Physics 105 and any of the following courses: CSE 64, Math. 74, Math. 170A-B-C, Math. 174, Biol. 181, Chem. 134.) Two hours' lecture, three hours' laboratory. *Prerequisite: Phys. 4A-B-C-D-E or 2A-B-C-D or equivalent; Math. 2A-B-C-DA-EA, or 2AH-BH-CH-DH-EH, or equivalent.* (F,S)

**110A. Mechanics (4)**

Mechanics of systems of particles; conservation laws, planetary motion; linear oscillators; statics and dynamics of plane rigid bodies. Four hours' lecture. *Prerequisites: Phys. 2C or 4D, Math. 2DA-EA-F, or 2DH-EH-FH (co-registration in Math. 2F or 2FH permitted).* (F)

**110B. Mechanics (4)**

Special relativity; Lagrange's and Hamilton's equations; small oscillations of coupled systems; noninertial frames; general motion of rigid bodies. Four hours' lecture. *Prerequisites: Phys. 105, 110A, Math. 2F or 2FH.* (W)

**120A-B. Physical Measurements (4-4)**

A laboratory-lecture course in physical measurements with an emphasis on electronic methods. Topics include circuit theory, special circuits. Fourier analysis, noise, transmission lines, transistor theory, amplifiers, feedback, operational amplifiers, oscillators, pulse circuits, digital electronics. Three hours' lecture, four hours' laboratory. *Prerequisites: Phys. 2CL and 2DL, Phys. 100A-B.* (W,S)

**121. Experimental Techniques (4)**

A laboratory-lecture course on the performance of scientific experiments with an emphasis on the use of microcomputers for control and data handling. Topics include microcomputer-architecture, interfacing, and programming, digital to analog and analog to digital conversion, asynchronous buses, interrupt and control techniques, transducers, actuators, digital signal processing—signal filtering, deconvolution, averaging and detection, construction techniques—soldering, parts selection, assembly methods, project management—planning, funding, scheduling, and utilization of personnel. Three hours' lecture, four hours' laboratory. *Prerequisites: Phys. 120A-B or equivalent.* (W)

**125. The Physical Universe (4)**

Survey of current astrophysical knowledge for science and engineering majors or students with strong preparation in physics and mathematics. Topics will include: properties of stars; stellar structure and evolution; physics of white dwarfs; neutron stars and black holes; the interstellar medium; the Milky Way and other galaxies; active galaxies and quasi-stellar objects; gravitation,



## GRADUATE

cosmology, and the Big Bang. Four hours' lecture. *Prerequisite:* Prior or concurrent enrollment in Phys. 2D, 4E, or equivalent, or consent of instructor. (Not offered in 1992-93.) (S)

**130A. Quantum Physics (4)**

Phenomena which led to the development of quantum mechanics. Wave mechanics; the Schrödinger equation, interpretation of the wave function, the uncertainty principle, piece-wise constant potentials, simple harmonic oscillator, central field and the hydrogen atom. Four hours' lecture. *Prerequisites:* Math. 110 or equivalent, Phys. 2D, 4E, or equivalent, Phys. 100A-B-C or equivalent, Phys. 105, Phys. 110A-B recommended. (F)

**130B. Quantum Physics (4)**

Observables and measurements, matrix mechanics, angular momentum and spin, the variational principle, perturbation theory. Atomic physics, Zeeman effect, spin-orbit interaction, fine structure principle. Four hours' lecture. *Prerequisites:* Phys. 105, 110A, 130A. (W)

**130C. Quantum Physics (4)**

Elementary nuclear physics, quantum mechanics of radiation, elementary particles and scattering. Three hours' lecture. *Prerequisites:* Phys. 100C, 130B. (S)

**131. Modern Physics Laboratory (2)**

Experiments in radioactivity, X-rays, atomic physics, resonance physics, solid-state physics, etc. Four hours' laboratory. *Prerequisites:* Phys. 2CL and 2DL, Phys. 130A. (W,S)

**132. Modern Physics Laboratory (2)**

Experiments in atomic physics, optics, physical electronics, fluid dynamics, surface physics, etc. Four hours' laboratory. *Prerequisites:* Phys. 2CL and 2DL, Phys. 130A-B. (S)

**133. Condensed Matter/Materials Science Laboratory (2)**

A project-oriented laboratory course utilizing state-of-the-art experimental techniques in materials science. Preparation and characterization of thin film and bulk materials with emphasis on superconductivity and magnetism. *Prerequisites:* Physics 2CL-DL. (S)

**140A. Statistical and Thermal Physics (4)**

Statistical description of physical systems, the concepts of ensembles, entropy and temperature, the thermodynamic laws, thermodynamic potentials, and the ideal gas. Four hours' lecture. *Prerequisites:* Phys. 105, 110A, and concurrent enrollment in 130A, or consent of instructor. (F)

**140B. Statistical and Thermal Physics (4)**

Bose-Einstein and Fermi-Dirac statistics, phase transitions, fluctuation and transport phenomena. Applications to the non-ideal gas, radiation, and chemical and condensed matter physics. Four hours' lecture. *Prerequisites:* Phys. 130A and 140A. (W)

**150. Continuum Mechanics (4)**

Mechanics of continuous media; waves, instabilities, applications to earth sciences, oceanography and aerodynamics. Three hours' lecture. *Prerequisite:* Phys. 110B. (Not offered in 1992-93.) (S)

**151. Plasma Physics (4)**

Particle motions, plasmas as fluids, waves, diffusion, equilibrium and stability, nonlinear effects, controlled fusion. Three hours' lecture. *Prerequisites:* Phys. 100A-B, 110A. (S)

**152. Introduction to Solid-State Physics (4)**

Crystal symmetry, free electron gas, band structure, properties of insulators, semiconductors and metals; atomic diffusion, alloys, electric transport phenomena. Four hours' lecture. *Prerequisites:* Phys. 130B, 140B. (S)

**153. Topics in Biophysics/Photobiology (4)**

(Course content varies yearly.) Basic principles of photobiology and photochemistry. Photochemical mechanisms in photosynthesis. Photoreceptor pigment systems and photobiological

control mechanisms in living organisms. Three hours' lecture. (Same as Biology 109, Chemistry 153.) *Prerequisite:* upper-division standing in biology, chemistry, or physics, or consent of instructor. (S)

**155. Nonlinear Dynamics (4)**

Qualitative aspects of Hamiltonian and dissipative dynamical systems: stability of orbits, integrability of Hamiltonian systems, chaos and nonperiodic motion, transition to chaos. Examples to be drawn from mechanics, fluid mechanics, and related physical systems. Numerical work and graphical display and interpretation will be emphasized. Three hours' lecture. *Prerequisites:* Phys. 100B, 110B. (S)

**160. Stellar Astrophysics (4)**

Introduction to stellar astrophysics: observational properties of stars, solar physics, radiation and energy transport in stars, stellar spectroscopy, nuclear processes in stars, stellar structure and evolution, degenerate matter and compact stellar objects. Physics 160, 161, 162 may be taken as a three-quarter sequence for students interested in pursuing graduate study in astrophysics or individually as topics of interest. *Prerequisites:* Phys. 2 or 4 sequence or equivalent, upper-division standing in physical science or engineering. (F)

**161. The Galaxy and the Interstellar Medium (4)**

The physics of the interstellar medium: thermal and nonthermal processes, 21 cm radiation, ionized hydrogen regions, supernovae and supernovae remnants; the physics and chemistry of interstellar dust; star formation, the structure of the Milky Way galaxy, stellar motions and distances, stellar populations. Physics 160, 161, 162 may be taken as a three-quarter sequence for students interested in pursuing graduate study in astrophysics or individually as topics of interest. Some outside preparation may be required for students who have not taken Physics 160. *Prerequisites:* Phys. 2 or 4 sequence or equivalent, upper-division standing in physical science or engineering. (W)

**162. Galaxies and Cosmology (4)**

The structure and properties of normal galaxies, galaxy rotation and dynamics, galaxy formation and evolution, the physics of active galactic nuclei: radio galaxies, Seyfert galaxies and quasi-stellar objects, the extragalactic distance scale, and physical cosmology. Physics 160, 161, 162 may be taken as a three-quarter sequence for students interested in pursuing graduate study in astrophysics or individually as topics of interest. Some outside preparation may be required for students who have not taken Physics 160 and 161. *Prerequisites:* Phys. 2 or 4 sequence or equivalent, upper-division standing in physical science or engineering. (S)

**182. Atmospheric Physics and Flight Aerodynamics (4)**

The application of thermodynamics and fluid mechanics to a study of the earth's atmosphere and to the flight of aircraft in that atmosphere. Topics include winds, stability, fronts, cloud physics, lift, drag, aircraft stability, and performance. Three hours' lecture. *Prerequisites:* upper-division standing in physical science, engineering, or consent of instructor. (S)

**195. Physics Instruction (2)**

Students will be responsible for and teach a class section of a lower-division physics course. They will also attend a weekly meeting on teaching methods and materials conducted by the professor who supervises their teaching. (P/NP grades only.) *Prerequisite:* consent of instructor. (F,W,S)

**198. Directed Group Study (2 or 4)**

Directed group study on a topic or in a field not included in the regular departmental curriculum. (P/NP grades only.) *Prerequisites:* consent of instructor and departmental chair. (F,W,S)

**199. Special Project (2 or 4)**

Independent reading or research on a problem by special arrangement with a faculty member. (P/NP grades only.) *Prerequisites:* consent of instructor and departmental chair. (F,W,S)

**200A. Theoretical Mechanics (4)**

Lagrange's equations and Hamilton's principle; Lagrangian for charges in electric and magnetic fields and for electro-mechanical systems, symmetry and constants of the motion, central forces and scattering theory, small oscillations, guiding center theory, parametric instabilities, pondermotive effect, adiabatic invariants. *Prerequisite:* Phys. 110B or equivalent. (F)

**200B. Theoretical Mechanics (4)**

Hamilton's equations, canonical transformations, Hamilton-Jacobi theory, action-angle variables, canonical perturbation theory, adiabatic invariants, surface of sections, KAM theorem. *Prerequisite:* Phys. 200A. (W)

**201. Mathematical Physics (5)**

An introduction to mathematical methods used in theoretical physics. Topics include: a review of complex variable theory, applications of the Cauchy residue theorem, asymptotic series, method of steepest descent, Fourier and Laplace transforms, series solutions for ODE's and related special functions, Sturm Liouville theory, variational principles, boundary value problems, and Green's function techniques. (F)

**203A. Advanced Classical Electrodynamics (5)**

Electrostatics, symmetries of Laplace's equation and methods for solution, boundary value problems, electrostatics in macroscopic media, magnetostatics, Maxwell's equations, Green functions for Maxwell's equations, plane wave solutions, plane waves in macroscopic media. *Prerequisite:* Phys. 100C or equivalent. (W)

**203B. Advanced Classical Electrodynamics (4)**

Special theory of relativity, covariant formulation of electrodynamics, radiation from current distributions and accelerated charges, multipole radiation fields, waveguides and resonant cavities. *Prerequisite:* Phys. 203A. (S)

**206. Topics in Biophysics and Physical Biochemistry (4)**

(Same as Biology 206, Chemistry 206.) Selection of topics of current interest. Examples: primary processes of photosynthesis; membrane biophysics; applications of physical methods to problems in biology and chemistry, e.g., magnetic resonance, X-ray diffraction, fluctuation spectroscopy, optical techniques (fluorescence, optical rotary dispersion, circular dichroism). Topics may vary from year to year. *Prerequisite:* consent of instructor. (W)

**210A. Equilibrium Statistical Mechanics (5)**

Fundamental principles; recurrence, ergodicity, and mixing; entropy; microscopic basis of thermodynamics. Thermodynamics; equations of state; thermodynamic potentials; phase transitions. Statistical ensembles; Gibbs' distribution; classical and quantum statistics; Bose condensation; Sommerfeld expansion; applications. Classical interacting systems; cluster expansions; distribution functions. Other topics may include: Ornstein-Zernike Theory; Thomas-Fermi and Debye-Huckel approximations. Landau-Ginzburg Theory; Ising model; mean field theory; critical behavior of mean field theories; fluctuations; superconductivity. *Prerequisites:* Phys. 140A-B, 152, or equivalent. Concurrent enrollment in Phys. 212B. (S)

**210B. Nonequilibrium Statistical Mechanics (4)**

Transport phenomena; kinetic theory of gases; Boltzmann equation; Chapman-Enskog method; stochastic processes; Langevin and Fokker-Planck equation; BBGKY hierarchy; molecular dynamics; quantum kinetics. Fluctuation-dissipation theorem. Other topics may include: Kubo's formula; dispersion relations; Onsager reciprocity; conduction and diffusion. Fluids; hydrodynamic modes; nonlinear effects and mode-mode coupling; Benard convection, BZ reaction; turbulent mixing and Kolmogorov spectrum. First order phase transitions; nucleation; spinodal decomposition. *Prerequisite:* Phys. 210A. (F)

**211A. Solid-State Physics (5)**

The first of a two-quarter course in solid-state physics. Covers a range of solid-state phenomena that can be understood within an independent particle description. Topics include: chemical versus band-theoretical description of solids, electronic band structure calculation, lattice dynamics, transport phenomena and electrodynamics in metals, optical properties, semiconductor physics. *Prerequisite: Phys. 152 or equivalent.* (F)

**211B. Solid-State Physics (4)**

Continuation of 211A. Deals with collective effects in solids arising from interactions between constituents. Topics include electron-electron and electron-phonon interactions, screening, band structure effects, Landau Fermi liquid theory. Magnetism in metals and insulators, superconductivity; occurrence, phenomenology, and microscopic theory. *Prerequisites: Phys. 210A, 211A.* (W)

**212A. Quantum Mechanics (4)**

Hilbert space formulation of quantum mechanics and application to simple systems: states and observables, uncertainty relations and measurements, time evolution, and mixed states and density matrix. Symmetries: commuting observables and symmetries, rotation group representations, Clebsch-Gordan coefficients, Wigner-Eckhardt theorem, and discrete symmetries (parity, time reversal, etc.). *Prerequisite: Phys. 130B or equivalent.* (F)

**212B. Quantum Mechanics (4)**

Time independent perturbation theory: non-degenerate and degenerate cases, Zeeman effect, fine structure, exclusion principle, and many-electron atoms. Time dependent perturbation theory: interaction picture and Dyson series, transition rates. Radiation theory: quantization of EM field, calculation of atomic level transition rates, line width, and spontaneous decay. *Prerequisite: Phys. 212A.* (W)

**212C. Quantum Mechanics (4)**

Scattering theory: Lippman-Schwinger formalism, Born approximation, partial waves, inelastic processes, and spin dependence. Path integrals: introductions and simple examples, rigid rotator, and Bohm-Aharonov effect. Dirac equation: single particle equation, hydrogen atom, and holes. *Prerequisites: Phys. 212A, 212B.* (S)

**213A-B. Theoretical Nuclear Physics (4-4)**

Basic phenomenology of strong interactions; two and three-nucleon systems; weak and electromagnetic interactions of nucleons; thermonuclear reactions; nuclear systematics, models of nuclear structure, particle-transfer reactions, fission; introductory BCS pairing and nuclear matter theory. *Prerequisites: Phys. 130C or equivalent, Phys. 212C.* (F,W)

**214. Physics of Elementary Particles (4)**

Classification of particles using symmetries and invariance principles, quarks and leptons, quantum electrodynamics, weak interactions,  $e^+e^-$  interactions, deep-inelastic lepton-nucleon scattering, pp collisions, introduction to QCD. *Prerequisite: Phys. 215A.* (W)

**215A. Particles and Fields (4)**

The first quarter of a three-quarter course on field theory and elementary particle physics. Topics covered include the relation between symmetries and conservation laws, the calculation of cross sections and reaction rates, covariant perturbation theory, and quantum electrodynamics. *Prerequisite: concurrent enrollment in Phys. 212C.* (F)

**215B. Particles and Fields (4)**

Continuation of 215A. Gauge theory quantization by means of path integrals, SU(3) symmetry and the quark model, spontaneous symmetry breakdown, introduction to QCD and the Glashow-Weinberg-Salam model of weak interactions, basic issues of renormalization. *Prerequisite: Phys. 215A.* (W)

**215C. Particles and Fields (4)**

Modern applications of the renormalization group in quantum chromodynamics and the weak interactions. Unified gauge theories, particle cosmology, and special topics in particle theory. *Prerequisites: Phys. 215A, 215B.* (S)

**216. Atomic and Molecular Physics (4)**

Structure of atoms, the Hartree-Fock method, correlation energy and relativistic corrections. Structure of molecules, the Born-Oppenheimer method, the molecular electronic state, the stability and build-up of molecules, molecular orbital theory. The interaction of atoms and molecules with external fields. Atomic and molecular collisions. *Prerequisite: Phys. 212A.* (W)

**217A-B. Renormalization in Field Theory, the Renormalization Group, and Critical Phenomena (4-4)**

The pertinent concepts and ideas in the theory of critical phenomena are explained using the field theory techniques of renormalization and the renormalization group. Modern applications of the renormalization group in quantum chromodynamics and the electroweak model are discussed in part B. Part A is oriented towards condensed matter and particle physics theorists. The focus of part B is on particle physics. *Prerequisite: Phys. 212C or consent of instructor.* (Not offered in 1992-93.) (S,F)

**218A. Plasma Physics (4)**

The basic physics of plasmas is discussed for the simple case of an unmagnetized plasma. Topics include: thermal equilibrium statistical properties, fluid and Landau theory of electron and ion plasma waves, velocity space instabilities, quasi-linear theory, fluctuations, scattering or radiation, Fokker-Planck equation. (F)

**218B. Plasma Physics (4)**

This course deals with magnetized plasma. Topics include: Appleton-Hartree theory of waves in cold plasma, waves in warm plasma (Bernstein waves, cyclotron damping), MHD equations, MHD waves, low frequency modes, and the adiabatic theory of particle orbits. *Prerequisite: Phys. 218A.* (W)

**218C. Plasma Physics (4)**

This course deals with the physics of confined plasmas with particular relevance to controlled fusion. Topics include: topology of magnetic fields, confined plasma equilibria, energy principles, ballooning and kink instabilities, resistive MHD modes (tearing, rippling and pressure-driven), gyrokinetic theory, microinstabilities and anomalous transport, and laser-plasma interactions relevant to inertial fusion. *Prerequisite: Phys. 218B.* (S)

**220. Group Theoretical Methods in Physics (4)**

Study of the representations and applications of groups to problems in physics, with particular emphasis on the permutation of unitary groups. *Prerequisite: Phys. 212C.* (S/U grades permitted.) (S)

**221. Advanced Mechanics (4)**

Advanced topics in the theory of nonlinear dynamics. *Prerequisite: Phys. 200B.* (S/U grades permitted.) (S)

**223. Stellar Structure and Evolution (4)**

Energy generation, flow, hydrostatic equilibrium, equation of state. Dependence of stellar parameters (central surface temperature, radius, luminosity, etc.) on stellar mass and relation to physical constants. Relationship of these parameters to the H-R diagram and stellar evolution. Stellar interiors, opacity sources, radiative and convective energy flow. Nuclear reactions, neutrino processes. Polytropic models. White dwarfs and neutron stars. *Prerequisites: Phys. 130C or equivalent, Phys. 140A-B or equivalent.* (S/U grades permitted.) (Offered in alternate years.) (F)

**224. Physics of the Interstellar Medium (4)**

Gaseous nebulae, molecular clouds, ionized regions, and dust. Low energy processes in neutral and ionized gases. Interaction of matter with radiation, emission and absorption processes, formation of atomic lines. Energy balance, steady state tem-

peratures, and the physics and properties of dust. Masers and molecular line emission. Dynamics and shocks in the interstellar medium. *Prerequisites: Phys. 130A-B or equivalent, Phys. 140A-B or equivalent.* (S/U grades permitted.) (Offered in alternate years.)

**225A-B. General Relativity and Cosmology (4-3)**

The principle of covariance, tensors and tensor transformations in special relativity, the principle of equivalence; tensor calculus; foundations of general relativity, applications and tests of the theory, gravitational waves; applications in cosmology and observational tests of cosmological theories. *Prerequisite: consent of instructor.* (S/U grades permitted.) (F,W)

**226. Galaxies and Galactic Dynamics (4)**

The structure and dynamics of galaxies. Topics include potential theory, the theory of stellar orbits, self-consistent equilibria of stellar systems, stability and dynamics of stellar systems including relaxation and approach to equilibrium. Collisions between galaxies, galactic evolution, dark matter, and galaxy formation. *Prerequisite: consent of instructor.* (Offered in alternate years.)

**227. Cosmology (4)**

An advanced survey of topics in physical cosmology. The Friedmann models and the large-scale structure of the universe, including the observational determination of  $H_0$  (the Hubble constant) and  $q_0$  (the deceleration parameter). Galaxy number counts. A systematic exposition of the physics of the early universe, including vacuum phase transitions; inflation; the generation of net baryon number, fluctuations, topological defects and textures. Primordial nucleosynthesis, both standard and nonstandard models. Growth and decay of adiabatic and isocurvature density fluctuations. Discussion of dark matter candidates and constraints from observation and experiment. Nucleocosmochronology and the determination of the age of the universe. *Prerequisite: consent of instructor.* (Offered in alternate years.)

**228. High-Energy Astrophysics and Compact Objects (4)**

The physics of compact objects, including the equation of state of dense matter and stellar stability theory. Maximum mass of neutron stars, white dwarfs, and super-massive objects. Black holes and accretion disks. Compact x-ray sources and transient phenomena, including x-ray and  $\gamma$ -ray bursts. The fundamental physics of electromagnetic radiation mechanisms: synchrotron radiation, Compton scattering, thermal and nonthermal bremsstrahlung, pair production. Pulsars. Particle acceleration models. Neutrino production and energy loss mechanisms. Supernovae and neutron star production. *Prerequisites: Phys. 130A-B-C or equivalent.* (Offered in alternate years.)

**230. Advanced Solid-State Physics (4)**

Selection of advanced topics in solid-state physics; material covered may vary from year to year. Examples of topics covered: disordered systems, surface physics, strong-coupling superconductivity, quantum Hall effect, low-dimensional solids, heavy fermion systems, high-temperature superconductivity, solid and liquid helium. *Prerequisite: Phys. 211B.* (S)

**231. Collision Theory (4)**

Collision theory and its application to atomic and molecular processes. Description of collision processes, scatterings and resonances in composite systems. Rearrangement collisions and the methods of approximation. *Prerequisites: Phys. 212A-B.* (S/U grades permitted.) (Not offered in 1992-93.) (S)

**233. Advanced Elementary Particle Theory (4)**

Current problems in elementary particle theory. *Prerequisite: Phys. 215A.* (S/U grades permitted.) (Not offered in 1992-93.) (W)

**234. Nonneutral Plasmas (4)**

This course treats the physics of nonneutral plasmas. Topics include equilibrium, stability, transport, linear modes and in-

stabilities, and the effects of strong correlation and strong magnetization. *Prerequisite: Phys. 218C or consent of instructor.* (Not offered in 1992-93.) (F)

**235. Nonlinear Plasma Theory (4)**

This course deals with nonlinear phenomena in plasmas. Topics include: orbit perturbation theory, stochasticity, Arnold diffusion, nonlinear wave-particle and wave-wave interaction, resonance broadening, basics of fluid and plasma turbulence, closure methods, models of coherent structures. *Prerequisite: Phys. 218C or consent of instructor.* (Not offered in 1992-93.) (W)

**236. Many-Body Theory (4)**

Effects of interactions in large quantum mechanical systems at zero or finite temperature analyzed from a unified viewpoint. Symmetries, conservation laws, perturbation theory, sum rules, inequalities. Applications to Bose, Fermi, normal, superfluid, charged, neutral, degenerate, dilute, etc., systems. *Prerequisites: Phys. 210A-B, 212C.* (S/U grades permitted.) (S)

**239. Special Topics (1-3)**

From time to time a member of the regular faculty or a resident visitor will find it possible to give a self-contained short course on an advanced topic in his or her special area of research. This course is not offered on a regular basis, but it is estimated that it will be given once each academic year. (S/U grades permitted.)

**250. Condensed Matter Physics Seminar (0-1)**

Discussion of current research in physics of the solid state and of other condensed matter. (S/U grades only.) (F,W,S)

**251. High-Energy Physics Seminar (0-1)**

Discussions of current research in nuclear physics, principally in the field of elementary particles. (S/U grades only.) (F,W,S)

**252. Plasma Physics Seminar (0-1)**

Discussions of recent research in plasma physics. (S/U grades only.) (F,W,S)

**253. Astrophysics and Space Physics Seminar (0-1)**

Discussions of recent research in astrophysics and space physics. (S/U grades only.) (F,W,S)

**254. Atomic and Molecular Physics Seminar (0-1)**

Discussions of current research in atomic and molecular structures and collisions. (S/U grades only.) (Not offered in 1992-93.) (F,W,S)

**255. Theoretical Solid-State Seminar (0-1)**

Discussions of current research in theoretical solid-state physics. (S/U grades only.) (Not offered in 1992-93.) (F,W,S)

**256. Biophysics Special Topics Seminar (0-1)**

Discussions of current research in experimental solid state physics and biophysics. (S/U grades only.) (F,W,S)

**257. High-Energy Physics Special Topics Seminar (0-1)**

Discussions of current research in high-energy physics. (S/U grades only.) (F,W,S)

**258 Astrophysics and Space Physics Special Topics Seminar (0-1)**

Discussions of current research in astrophysics and space physics. (S/U grades only.) (F,W,S)

**259. Biophysics Seminar (0-1)**

Discussions of current research in biophysics. (S/U grades only.) (F,W,S)

**260. Physics Colloquium (0-1)**

Discussions of recent research in physics directed to the entire physics community. (S/U grades only.) (F,W,S)

**261. Seminar on Physics Research at UCSD (0-1)**

Discussions of current research conducted by faculty members in the Department of Physics. (S/U grades only.) (W,S)

**297. Special Studies in Physics (1-4)**

Studies of special topics in physics under the direction of a faculty member. *Prerequisites: consent of instructor and departmental vice chair, education.* (S/U grades permitted.) (F,W,S)

**298. Directed Study in Physics (1-12)**

Research studies under the direction of a faculty member. (S/U grades permitted.) (F,W,S)

**299. Thesis Research in Physics (1-12)**

Directed research on dissertation topic. (S/U grades permitted.) (F,W,S)

**500. Physics Instruction (1-4)**

Credit may be obtained for participation in undergraduate teaching as follows: one unit is equivalent to (a) two one-hour recitation sessions without grading; (b) one one-hour recitation session with grading; (c) one two-hour problem section; or (d) one three-hour laboratory section. Weekly meeting with instructor is required. (S/U grades only) (F,W,S)

**POLITICAL SCIENCE**

OFFICE: Third College Humanities Building

**Professors**

- Ellen T. Comisso, Ph.D.
- Wayne A. Cornelius, Ph.D.
- Peter F. Cowhey, Ph.D.
- Gary W. Cox, Ph.D.
- Paul Drake, Ph.D., *Chair*
- Peter A. Gourevitch, Ph.D.
- Peter H. Irons, Ph.D., J.D.
- Gary C. Jacobson, Ph.D.
- Samuel H. Kernell, Ph.D.
- Sanford A. Lakoff, Ph.D.
- Arend Lijphart, Ph.D.
- Mathew D. McCubbins, Ph.D.
- Samuel L. Popkin, Ph.D.
- Susan L. Shirk, Ph.D.
- Peter H. Smith, Ph.D.
- Tracy B. Strong, Ph.D.

**Adjunct Professors**

- Chalmers Johnson, Ph.D.
- Miles Kahler, Ph.D.

**Associate Professors**

- Nathaniel L. Beck, Ph.D.
- Amy Bridges, Ph.D.
- Ann L. Craig, Ph.D.
- Steven P. Erie, Ph.D.
- Harry Hirsch, Ph.D.
- Victor V. Magagna, Ph.D.
- David R. Mares, Ph.D.
- Kaare Strom, Ph.D.

**Adjunct Associate Professor**

- Daniel Hallin, Ph.D.

**Assistant Professors**

- Alan C. Houston, Ph.D.
- Arthur W. Lupia, Ph.D.

- Lisa L. Martin, Ph.D.
- Paul A. Papayoanou, Ph.D.
- Philip G. Roeder, Ph.D.

**Adjunct Assistant Professors**

- Tun-Jen Cheng, Ph.D.
- Frances M. Rosenbluth, Ph.D.
- Matthew F. Shugart, Ph.D.

**THE MAJOR PROGRAM**

Political science addresses some of the fundamental problems facing human society. Questions concerning world peace, government policies aimed at achieving economic stability and growth, the management of environmental quality, control over political competition, the possibility of using law to affect social and political change, and the gap between the rich and poor in the U.S. and abroad are all on the research agenda of contemporary political scientists. The general purpose of the major is to address these and other issues systematically, and, simultaneously, to raise the broad theoretical questions which can help students relate today's political debates to those debates about politics which have kept a theoretical tradition alive for over 2,000 years.

Majors are required to take the full introductory sequence made up of 10, 11 and 12, and any twelve four-unit upper-division courses. The Revelle Social Science Sequence which consists of 10A, 10B, and 10C may be substituted for 10, 11, and 12. Political science majors who substitute the Revelle sequence for P.S. 10, 11, and 12 must take at least one upper-division course in American politics and one upper-division course in international relations. All political science majors are strongly encouraged to take at least one quarter of the P.S. 110A-B-C sequence and P.S. 170A. The department also requires that all students declaring the political science major as of fall 1986 take Social Science 60 (Elementary Statistics for the Social Sciences). This course should preferably be taken by the second quarter of the student's junior year. Students may substitute either Political Science 170A or Economics 120A for this requirement, or petition for an equivalency. Joint majors may, under certain circumstances, be exempted from the statistics requirement; they should contact the undergraduate adviser.

Agreements signed between UCSD and several community colleges allow students to apply some community college courses toward lower-division course requirements for the major. Transfer students must, however, take at least one of the lower-division courses in residence at UCSD. Courses taken elsewhere may be credited

toward the major requirement if approved by the department on the basis of individual petition.

Students who pass the Advanced Placement (AP) Tests in American or Comparative Politics may petition to be exempted from taking P.S. 10 or 11 (respectively).

At least nine courses in political science must be taken in residence at UCSD. A total maximum of six courses may be taken elsewhere and applied toward the major. This applies to transfer students as well as students who study abroad on the Education Abroad Program (EAP) or the Opportunities Abroad Program (OAP). Students planning to transfer course work completed elsewhere are urged to consult the undergraduate adviser.

Double majors who include political science as one of their two majors must fulfill the requirements of both programs. They must take at least twenty-two upper-division courses, including ten in each major. Please consult the undergraduate adviser for more information.

Students must maintain an overall 2.0 GPA in the major. Students must also attain a C- in any course counted toward completion of the major. Candidates for departmental honors are required to take P.S. 191A and B in which they write a senior thesis. (A 3.3 GPA in the major is currently a prerequisite for honors.) These courses may be counted toward the upper-division requirement.

The variety of "areas of concentration" within the upper-division curriculum are identified to help guide students in course selection and program planning. Outside of the lower-division sequence there are no breadth requirements.

*After a student declares political science as his or her major, he or she is encouraged to see the undergraduate adviser for a general discussion of his or her overall program.*

**Since course offerings may change from year to year, students are strongly advised to consult the department for the latest listing of courses before preregistration.**

### CAREER GUIDANCE

Many political science majors at UCSD will seek admission to a *law school*. Although law schools make no recommendation concerning the usefulness of any undergraduate major, a B.A. in political science should be seen as a useful complement to a law degree. Students who take courses in American government, policy analysis, and law and politics find that they develop a keen understanding of the role of law in the general political process. This helps students understand the limits and possibilities of the legal process in fostering change or in preserving the status quo. This same curriculum provides a

solid foundation for a career in *journalism*. If students have any specific questions regarding law, we advise them to consult with the prelaw adviser.

Increasingly, political science majors are preparing for careers in *business* or as *policy analysts* in both the public and private sectors. Many of these students pursue advanced degrees in public policy or study for a master's in business administration. Students interested in this option should look into policy analysis courses and American or comparative politics as an area of concentration. Some political science majors are interested in careers in international organization or *diplomacy*. These students should look into international relations as an area of concentration. In addition, a broad array of courses in comparative politics is essential for anyone interested in a career of international service. The premise of our educational philosophy is that the best professional preparation for productive careers which we can provide is one which is broad, theoretical, and only indirectly related to the current job market.

A political science major offers excellent preparation for teaching in the elementary schools. If you are interested in earning a California teaching credential from UCSD, contact the Teacher Education Program for information about the prerequisite and professional preparation requirements. It is recommended that you contact TEP as early as possible in your academic career.

For additional career guidance students are encouraged to consult *Careers and the Study of Political Science* available in the department office.

### AREAS OF CONCENTRATION

The Department of Political Science offers four primary areas of concentration. These areas are distinguished for purposes of career guidance. At this time, the Department of Political Science does not require, but encourages, students to take courses in the different areas of concentration.

More detailed information on fields of concentration is available in the department's *Undergraduate Handbook*.

#### American Politics

Courses focusing on American institutions and processes, as well as constitutional law, American political development, public policy analysis, and urban politics are listed in this area. P.S. 10 is the foundation course. Students with a special interest in American politics are encouraged to take courses in American history and economics (any introductory sequence). See

the course listings for prerequisites and sequencing.

#### Political Theory

This area of concentration includes courses focusing on the tradition of political discourse and analysis as well as specific questions of political philosophy.

P.S. 110A, 110B, and 110C provide the foundation for a concentration in political theory and an introduction to the broader normative and analytic questions of political science. They should precede the more advanced courses. Students of political theory are encouraged to examine the offerings in the Department of Philosophy (recommended are Phil. 101-107, 120, and 166).

#### Comparative Politics

P.S. 11 is the foundation course for the concentration in comparative politics. For upper-division courses, students are encouraged to mix theoretically informed courses with courses focusing on specific geographic areas. Some courses in international relations may also complement this field of concentration. Students should consider enrolling in history and foreign language courses in conjunction with their area interests in political science. Courses in anthropology and sociology often complement a comparative politics area of concentration, and the introductory sequence in economics is useful.

#### International Relations

P.S. 12 is the foundation course for an international relations area of concentration. In addition to courses within this field, students' career goals may be served by courses in American politics, political economy, or comparative politics. Students of international relations should consider studying American diplomatic history, European diplomatic history, and international economics. Students who wish to go on to a diplomatic career should become fluent in at least one foreign language.

### SPECIALIZED PROGRAMS

Students may choose to design their own area of concentration based on courses drawn from more than one of the fields listed above. In this option, courses would be selected based on a student's interest and career objectives. The following are examples of two specialized areas of concentration:

Political economy encompasses two sets of courses culled from virtually all the other areas of concentration. The first set of courses concerns the interrelationship between the political and economic orders (for example 102B, 126AA-



AB, 138A, and 144AA-AB). The second set of courses concerns the use of the methodology associated with economic analysis in order to address political questions (for example 100DA and 112A).

Latin American politics is built around courses in comparative politics and international relations. Upper-division courses are of two types: specific country studies (for example 134B or 134I) and topical courses (for example 134AA or 134D). This program of study could also include courses drawn from the general fields of comparative politics and international relations which are not focused on Latin America.

### MINOR IN POLITICAL SCIENCE

Students wishing to minor in political science are advised to take the introductory sequence and three upper-division courses, but students may choose to substitute upper-division courses for any of the three lower-division offerings.

### INTERDISCIPLINARY MINORS

The Department of Political Science takes part in two interdisciplinary minors offered at UCSD. The law and society minor offers students the opportunity to examine the role of the legal system in society. Students should note that Law and Society 101 (Contemporary Legal Issues) may, under certain circumstances, be used in fulfilling the twelve upper-division course requirement for the political science major. The minor in health care—social issues offers students a variety of perspectives that will enhance their ability to deal with complex social and ethical issues in modern health care. Additional information on these programs is available through the Warren Interdisciplinary Programs Office.

### RESEARCH

The Department of Political Science is closely affiliated with several research centers/institutes/projects currently on campus. Faculty members directly involved include: Wayne Cornelius, director, Center for U.S.-Mexican Studies; Samuel Kernell, coordinator, American Political Institutions Project; Peter Smith, director, Center for Iberian and Latin American Studies. For further information please refer to the *General Catalog* section on "Research at UCSD."

### THE PH.D. PROGRAM

The Department of Political Science at the University of California, San Diego offers a program of graduate studies leading to the Ph.D. de-

gree. Instruction is provided in the major fields of the discipline. For purposes of comprehensive examinations, the field is broken into four fields: American politics, comparative politics, international relations, and political theory. Students present exams in two of these fields. In their first field, students also present a focus area (such as legislative behavior, Latin America, international political economy, or modern political theory). The department also offers a variety of courses that are of a methodological or epistemological nature, spanning the various fields.

Students take two years of course work in preparation for their comprehensive exams. These eighteen courses include only two required courses (political theory and empirical research); they also include independent studies and reading courses. Students also attend regularly scheduled colloquia which feature presentations by faculty, outside speakers, and dissertation students.

During the first two years each student must take at least two specially designated research seminars (at least one in each of the two exam fields). Each seminar is devoted primarily to the completion of a seminar paper (thirty to forty pages) involving original research or other creative effort.

The comprehensive exams are both written and oral. They test more than just mastery of course work and hence there is no single set of courses required for any field exam. To pass the exams a student is expected not only to master the relevant literature, but also to be able to synthesize and analyze the major issues in the field.

Each comprehensive exam tests both knowledge of the major theoretical approaches in the field and the ability to apply those theories to important questions in the field. For one of the two exam fields, the student also designates a specific area of interest (a "focus area"). The written focus area exam tests the student's in-depth knowledge and understanding. The focus area exam is taken the same week as the general field exam, and there is one oral covering both exams. Each field publishes a list of focus areas; students may, with approval, craft their own focus area. Each field, in addition, publishes a list of suggested ways to prepare for its exams; each field also determines the research tools required for scholars in that field.

Students are expected to complete their comprehensive exams no later than their third year. Students who have done prior graduate work should be able to complete their exams by the end of their second year.

After passing both exams, students are expected to write a dissertation prospectus. This prospectus must be defended before a committee

of five faculty, including two members outside the department. This committee also administers the final oral defense of the thesis.

Many students will have defended their thesis before the beginning of their fourth year. It is expected that students will complete their theses within five years of starting the program. Students who undertake fieldwork may take one extra year.

Students interested in the program should consult the department graduate brochure for more detailed information.

### DEPARTMENTAL PH.D. TIME LIMIT POLICIES

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed six years. Total registered time at UCSD cannot exceed seven years.

## Courses

### LOWER DIVISION

#### 7. Introduction to Politics for Non-Political Science Majors (4)

The purpose of this course is to impart basic political literacy to students who have never had any political science. Democracy is examined both theoretically and institutionally, by comparing the American political system with that of other countries. The basic "text" is the U.S. Constitution. *Prerequisites:* this course cannot be used as credit toward the major; cannot be taken together with P.S. 10, can be followed by P.S. 11 and 12 if needed for a sequence.

#### 10. Introduction to Political Science: American Politics (4)

This course surveys the processes and institutions of American politics. Among the topics discussed are individual political attitudes and values, political participation, voting, parties, interest groups, Congress, presidency, Supreme Court, the federal bureaucracy, and domestic and foreign policy making.

#### 11. Introduction to Political Science: Comparative Politics (4)

The nature of political authority, the experience of a social revolution, and the achievement of an economic transformation will be explored in the context of politics and government in a number of different countries.

#### 11W. Writing in Comparative Politics (2)

This course, to be taken in conjunction with Political Science 11, is designed to provide tutorial help for students wishing to improve their writing skills in the political science discipline. (W)

#### 12. Introduction to Political Science: International Relations (4)

The issues of war/peace, nationalism/internationalism, and economic growth/redistribution will be examined in both historical and theoretical perspectives.

#### 12W. Writing in International Relations (2)

This course, to be taken in conjunction with Political Science 12, is designed to provide tutorial help for students wishing to



improve their writing skills in the political science discipline. (S)

**14. Politics and the Third World Poor (4)**

(Same as Third World Studies 14.) This course explores the context, structure, purpose, and fate of collective political action by the urban and rural poor in Latin America, Asia, and Africa. It examines local as well as national political organizations and their economic, social, and cultural foundations.

**27. Ethics and Society (4)**

(Same as Phil. 27.) An inquiry into the principles of ethical conduct and their applications. The course examines some of the major theories (including natural law, individual rights, utilitarianism) and the general issue of rights and obligations with respect to adherence to law (as in civil disobedience, abortion, and the refusal to obey an unjust law or order). Case studies will be employed to consider the relevance of these principles to various occupations such as business, engineering, law, and government, in order to enable students to anticipate some of the difficulties that will arise for them in real-life situations whenever hard moral choices must be made. Satisfies the Warren College ethics and society requirement. This course is required for all Warren students entering the college in fall 1985 and thereafter.

**40. Introduction to Law and Society (4)**

This course is designed as a broad introduction to the study of law as a social institution and its relations to other institutions in society. The focus will be less on the substance of law (legal doctrine and judicial opinions) than on the process of law—how legal rules both reflect and shape basic social values and their relation to social, political, and economic conflicts within society.

**90. Undergraduate Seminar (1)**

Selected topics to introduce students to current issues and trends in political science. May not be used to fulfill any major or minor requirements in political science.

**UPPER DIVISION**

**Minimum requirement for all upper-division courses is at least one quarter of lower-division political science, or upper-division standing.**

**AMERICAN POLITICS**

**100A. The Presidency (4)**

The role of the presidency in American politics. Topics will include nomination and election politics, relations with Congress, party leadership, presidential control of the bureaucracy, international political role, and presidential psychology. *Prerequisite: P.S. 10 or consent of instructor.*

**100B. The U.S. Congress (4)**

This course will examine the nomination and election of congressmen, constituent relationships, the development of the institution, formal and informal structures, leadership, comparisons of House with Senate, lobbying, and relationship with the executive branch. *Prerequisite: P.S. 10.*

**100C. American Political Parties (4)**

This course examines the development of the two major parties from 1789 to the present. Considers the nature of party coalitions, the role of leaders, activists, organizers, and voters, and the performance of parties in government. *Prerequisite: P.S. 10 or consent of instructor.*

**100DA. Voting, Campaigning, and Elections (4)**

(Same as Com/SF 168A.) This course will consider the nature of public opinion and voting in American government. Studies of voting behavior will be examined from the viewpoints of both citizens and candidates, and an effort will be made to de-

velop models of their electoral behavior. Attention will also be devoted to recent efforts to develop rational choice theories of electoral behavior and to critiques of elections as democratic institutions. The role of the mass media and money also will be examined. *Prerequisite: P.S. 10 or consent of instructor.*

**100E. Interest Group Politics (4)**

The theory and practice of interest group politics in the United States. Theories of pluralism and collective action, the behavior and influence of lobbies, the role of political action committees, and other important aspects of group action in politics are examined. *Prerequisite: P.S. 10 or consent of instructor.*

**100G. American Politics and Public Policy (4)**

Students in this course will study a number of arguments about the determinants of public policy. Class materials examine interest group, power elite, structuralist, electoral, and cultural theories, among others. Policy case studies will be provided for evaluating alternative theories. *Prerequisite: P.S. 10 or consent of instructor.*

**100H. Race and Ethnicity in American Politics (4)**

This course examines the processes by which racial and ethnic groups have/have not been incorporated into the American political system. The course focuses on the political experiences of European immigrant groups, blacks, Latinos, and Asians. *Prerequisite: P.S. 10 or consent of instructor.*

**102B. Politics of American Economic Policy (4)**

(Formerly P.S. 176) The impact of politics on American post-war economic policy making. Causes and solutions to America's current economic problems. Evaluation of the political dimensions of policy making in the Reagan and earlier administrations. Consideration of Marxian, liberal, and other interpretations of policy outcomes will be discussed. *Prerequisite: P.S. 10 or consent of instructor.*

**102C. American Political Development (4)**

(Formerly P.S. 122) American political development will be examined from both a comparative and theoretical perspective with special attention given to the interplay of societal and political change. The modernization of Congress, political parties. The bureaucracy, the federal system, and the judiciary will be examined. *Prerequisites: P.S. 10 and 11.*

**102DA-DB. Public Opinion and Political Ideology (4-4)**

(Same as Com/SF 124A and Com/SF 124B.) The structure, origins, and dynamics of public opinion and political ideology. 102DA considers the nature of public opinion and the factors that shape the development of political ideas—economic interests, psychological function, political communication and organization, etc. 102DB examines the development of political ideas in specific historical situations. *Prerequisite: P.S. 10 or consent of instructor.*

**102E. Urban Politics (4)**

This survey course focuses upon the following six topics: the evolution of urban politics since the mid-nineteenth century; the urban fiscal crisis; federal/urban relationships; the "new" ethnic politics; urban power structure and leadership; and selected contemporary policy issues such as downtown redevelopment, poverty, and race. *Prerequisite: P.S. 10 or consent of instructor.*

**102G. Seminar—Special Topics in American Politics (4)**

(Formerly P.S. 163) An undergraduate seminar designed to give students who have already had some course experience in upper-division American politics classes an opportunity to study some aspect of current American politics in greater depth in a small group setting. *Prerequisites: P.S. 10 and one upper-division class in American politics.*

**102H. Political and Legal Foundations of the American Economy (4)**

An examination of the political and legal arrangements necessary for the working of the modern American economy. Particu-

lar attention is given to the development of rules about private property. Insights from the "law and economics" fields are also considered. *Prerequisite: P.S. 10 or consent of instructor.*

**102IA-IB. The American News Media (4-4)**

(Same as Com/Cul 173 and Sociol. 165.) History, politics, social organization, and ideology of the American news media. 102IA surveys the development of the news media as an institution, from earliest newspapers to modern mass news media. 102IB deals with special topics, including the nature of television news, and with methods of news media research, and requires a research paper. *Prerequisites: for 102IA, P.S. 10; 102IA is required for 102IB or consent of instructor.*

**102J. Advanced Topics in Urban Politics (4)**

In this seminar students will do original research on selected topics in urban politics. Special attention will be paid to patterns of urbanization and class, the methods by which political leaders mobilize power, and the economic impacts of such urban political structures as the party machine and federal social programs. *Prerequisite: P.S. 10 or consent of instructor.*

**103A. California Government and Politics (4)**

This survey course explores six topics: 1) the state's political history; 2) campaigning, the mass media, and elections; 3) actors and institutions in the making of state policy; 4) local government; 5) contemporary policy issues; e.g., Proposition 13, school desegregation, crime, housing and land use, transportation, water; 6) California's role in national politics. *Prerequisite: P.S. 10 or consent of instructor.*

**104A. The Supreme Court and the Constitution (4)**

(Same as ETHN 155.) An introduction to the study of the Supreme Court and constitutional doctrine. Topics will include the nature of judicial review, federalism, race, and equal protection. The relation of judicial and legislative power will also be examined. *Prerequisite: P.S. 10 or consent of instructor.*

**104B. Civil Liberties—Fundamental Rights (4)**

This course will examine issues of civil liberties from both legal and political perspectives. Topics will include the First Amendment rights of speech, press, assembly, and religion; other "fundamental" rights, such as the right to privacy; and some issues in equal protection. Conflicts between governmental powers and individual rights will be examined. *Prerequisite: P.S. 10 or consent of instructor.*

**104C. Civil Liberties—The Rights of Criminals and Minorities (4)**

(Same as ETHN 156.) Examines the legal issues surrounding the rights of "marginal" groups such as aliens, illegal immigrants, and the mentally ill. Also includes a discussion of the nature of discrimination in American society.

**104F. Seminar in Constitutional Law (4)**

This seminar will provide an intensive examination of a major issue in constitutional law, with topics varying from year to year. Recent topics have included equal protection law and the rights of civilians in wartime. Students will be required to do legal research on a topic, write a legal brief, and argue a case to the seminar. Junior or senior standing required, as is consent of the instructor.

**104I. Law and Politics—Courts and Political Controversy (4)**

This course will examine the role of the courts in dealing with issues of great political controversy, with attention to the rights of speech and assembly during wartime, questions of internal security, and the expression of controversial views on race and religion. The conflict between opposing Supreme Court doctrines on these issues will be explored in the context of the case studies drawn from different historical periods. *Prerequisite: P.S. 10 or consent of instructor.*

**105A. Comparative Legal Cultures (4)**

A systematic and comparative treatment of the role of courts in various national settings. The impact of the judicial system on

the interplay between the legal and political cultures of Western democratic societies, of communist and some developing countries will be examined. *Prerequisite: P.S. 10 or consent of instructor.*

**106A. Politics and Bureaucracy (4)**

This course explores the problematic relationship between politics and bureaucracy. The theoretical perspectives of Weber, the Marxists, and the pluralists will be employed to understand the character of American bureaucratic development in the twentieth century. *Prerequisite: P.S. 10 or consent of instructor. P.S. 100A or 100B strongly recommended.*

■ **POLITICAL THEORY**

**110A. Systems of Political Thought (4)**

This course focuses on the development of politics and political thought in ancient Greece, its evolution through Rome and the rise of Christianity. Readings from Plato, Aristotle, Augustine, Machiavelli, and others.

**110B. Systems of Political Thought (4)**

The course deals with the period which marks the rise and triumph of the modern state. Central topics include the gradual emergence of human rights and the belief in individual autonomy. Readings from Machiavelli, Hobbes, Locke, Rousseau, and others. *Prerequisite: P.S. 110A recommended.*

**110C. Systems of Political Thought (4)**

The course deals with the period which marks the triumph and critique of the modern state. Central topics include the development of the idea of class, of the irrational, of the unconscious, and of rationalized authority as they affect politics. Readings drawn from Rousseau, Kant, Hegel, Marx, Nietzsche, and others. *Prerequisite: P.S. 110B recommended.*

**110DA. Contemporary Political Thought (4)**

(Formerly P.S. 102A) This course addresses certain problems which are characteristic of the political experience of the twentieth century. Topics considered are revolution, availability of tradition, and the problems of the rationalization of social and political relations. Readings from Nietzsche, Weber, Freud, Lenin, Gramsci, Dewey, Oakeshott, Arendt, Merleau-Ponty. *Prerequisites: sophomore standing, two courses in philosophy, or political or social theory.*

**110DC. Seminar: Contemporary Political Theory (4)**

This course focuses on selected theories and topics since the mid-nineteenth century. Theorists will include Nietzsche, Max Weber, Lenin, Freud, and Foucault. Topics will include authority, power, and political leadership. May be repeated once with instructor's permission. *Prerequisites: juniors and seniors with at least three courses in political theory, social theory, philosophy, European intellectual history, or consent of instructor.*

**110EA. American Political Thought (4)**

The first quarter examines the origins and development of American political thought from the revolutionary period to the end of the nineteenth century with special emphasis on the formative role of eighteenth-century liberalism and the tensions between "progressive" and "conservative" wings of the liberal consensus.

**110EB. American Political Thought (4)**

The second quarter examines some of the major themes of American political thought in the twentieth century including controversies over the meaning of democracy, equality, and distributive justice, the nature of "neoconservatism," and America's role as a world power.

**110J. Power in American Society (4)**

(Same as HIUS 126.) This course examines how power has been conceived and contested during the course of American history. The course explores the changes which have occurred in political rhetoric and strategies as America has moved from

a relatively isolated agrarian and commercial republic to a military and industrial empire.

**110K. Undergraduate Seminar (4)**

An undergraduate seminar designed to give students who have already had some course experience in upper-division political theory an opportunity to study some aspect of political theory in greater depth in a small group setting. *Prerequisite: two upper-division courses in political theory or consent of instructor.*

**112A. Economic Theories of Political Behavior (4)**

An introduction to theories of political behavior developed with the assumptions and methods of economics. General emphasis will be upon theories linking individual behavior to institutional patterns. Specific topics to be covered will include collective action, leadership, voting, and bargaining.

**112B. Politics, Philosophy, and Social Science Methodology (4)**

(Same as Com/SF 137.) An introduction to philosophy and the political implications of social science. Topics considered will include the nature of theory and evidence, the formulation of research questions, special problems in the study of human behavior or action and the relation between social science and public policy, events, and ideologies. *Prerequisite: upper-division standing or consent of instructor.*

**112C. Political Theory and Artistic Vision (4)**

(Same as Com/SF 125.) The course explores the modes of political thinking found in arts, especially in drama and literature. It focuses on particular topics (e.g., ends and means, political leadership, political economy). Some attempt will be made to develop implications inherent in art for the writing of political theory as a genre.

■ **COMPARATIVE POLITICS**

**120A. Political Development of Western Europe (4)**

An examination of various paths of European political development through consideration of the conflicts which shaped these political systems: the commercialization of agriculture; religion and the role of the church; the army and the state bureaucracy; and industrialization. Stress will be on alternative paradigms and on theorists. *Prerequisite: P.S. 11 or consent of instructor.*

**120B. The German Political System (4)**

An analysis of the political system of the Federal Republic of Germany with an emphasis on the party system, elections, executive-legislative relations, and federalism. Comparisons will be made with other West European democracies and the Weimar Republic. *Prerequisite: P.S. 11 or consent of instructor.*

**120C. Politics in France (4)**

The course will examine the consequences of social and economic change in France. Specific topics will include institutional development under a semipresidential system, parties and elections, and how well the country is prepared for the European Community market to be inaugurated in 1993. *Prerequisite: P.S. 11 or consent of instructor.*

**120D. Germany: Before, During, and After Division (4)**

Consideration of political, economic, and security factors that have kept Germany at the center of European developments for more than a century. *Prerequisite: P.S. 11 or consent of instructor.*

**120E. Scandinavian Politics (4)**

Introduction to the politics and societies of the Scandinavian states (Denmark, Finland, Norway, and Sweden). Focuses on historical development, political culture, constitutional arrangements political institutions, parties and interest groups, the Scandinavian welfare states, and foreign policy. *Prerequisite: P.S. 11 or consent of instructor.*

**120F. Government and Politics in Spain (4)**

This course will analyze the role of Spain in the world political economy from the sixteenth century, the consolidation of the

state, the continued development and control under Franco, and the emergence of democracy since 1975. Students who have gone to Spain or plan to do so in the Education Abroad Program are especially encouraged to enroll. *Prerequisite: upper-division standing.*

**120G. British Politics (4)**

Emphasis will be placed on the interaction between British political institutions and processes and contemporary policy problems: the economy, social policy, foreign affairs. The course assumes no prior knowledge of British politics, and comparisons with the United States will be drawn. *Prerequisite: P.S. 11 or consent of instructor.*

**124A. Political Consequences of Electoral Systems (4)**

A comparative survey of the major dimensions of the electoral systems used in contemporary democracies (including plurality and majority systems, proportional representation, and districting methods) and of their effects on party competition. *Prerequisite: P.S. 11 or consent of instructor.*

**126AA. Fundamentals of Political Economy (4)**

The first half of the two-quarter course will focus broadly on how economic behavior affects political action and institutions, and how political action and institutions affect economic behavior. Central consideration will be given to the impact of democratic political systems on various types of economic arrangements and vice versa. *Prerequisite: P.S. 11 or consent of instructor.*

**126AB. Issues in Political Economy (4)**

The second half of this two-quarter course will deal in depth with one or a number of specific issues touched on in the first half of the course (126AA) and dealt within the framework developed there. Issues may cover such topics as labor and politics, corporatism, politics and economics of bureaucratic organizations, the welfare state, equality, and other such questions. *Prerequisite: P.S. 126AA.*

**130AA. Soviet Politics and After (4)**

An analysis of the rise and decline of the Soviet Union and the politics of its successor regimes. *Prerequisite: P.S. 11 or consent of instructor.*

**130AB. The Soviet State and Society (4)**

An historical and topical survey of the transformation of Soviet society by the policies of the Communist Party. Special attention to the Leninist developmental strategy and the contemporary problems of socialization, economic reform, and particularistic nationalisms. (May not receive credit if 130AA was taken winter 1988 or winter 1989.) *Prerequisite: P.S. 11 or consent of instructor.*

**130AC. Seminar: Soviet Politics (4)**

Undergraduate research seminar on changes in the Soviet Union. Issues and research areas will vary each time the course is offered. *Prerequisite: consent of instructor.*

**130B. Politics in the People's Republic of China (4)**

This course analyzes the political system of China since 1949, including political institutions, the policy-making process, and the relationship between politics and economics. The main focus is on the post-Mao era of reform beginning in 1978. *Prerequisite: P.S. 11 or consent of instructor.*

**130H. Vietnam: The Politics of Intervention (4)**

(Formerly P.S. 133B) This course will examine the interventions of foreign powers in Vietnam between 1945 and 1975 (including France, the United States, China, and the Soviet Union) and the effects of intervention. *Prerequisite: P.S. 11 or consent of instructor.*

**132A. Political Modernization Theory (4)**

(Formerly P.S. 139) A survey of state building and the politics of economic development in a world historical perspective. *Prerequisite: P.S. 11 or consent of instructor.*

## POLITICAL SCIENCE

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### 133A. Introduction to Japanese Politics (4)

This course is designed to provide students with a basic grounding of modern Japanese politics. The course will first deal with the origin and evolution of political systems in modern Japan. It will then analyze in greater detail the political systems in comparative-historical perspective. *Prerequisite: P.S. 11 or consent of instructor.*

### 133B. Political Economy of the East Asian Newly Industrialized Countries (NICs) (4)

An introduction to the interrelationship between political and economic development in the newly industrializing countries of East Asia. Primary focus is on Korea and Taiwan, with brief coverage of Singapore and Hong Kong, and some comparisons with other developing countries. *Prerequisite: P.S. 11 or consent of instructor.*

### 133D. Japanese Foreign Policy (4)

This course will examine Japan's rise, fall, and rebirth as a world economic and military power, with emphasis on developments since the early 1970s. It will include the formation of foreign policy, changing conceptions of national interest and world order, and the impact of Japan on the world. *Prerequisite: P.S. 11 or consent of instructor.*

### 133E. Public Policy in Japan (4)

This course combines an examination of general models of the way in which public policy is made in Japan, and a review of outcomes in several substantive policy areas, such as education, public works, health and welfare, and pollution. *Prerequisite: P.S. 11 or consent of instructor.*

### 134AA-AB. Comparative Politics of Latin America (4-4)

(Formerly P.S. 187A-B) Comparative analysis of contemporary political systems and developmental profiles of selected Latin American countries, with special reference to the ways in which revolutionary and counter-revolutionary movements have affected the political, economic, and social structures observable in these countries today. Analyzes the performance of "revolutionary" governments in dealing with problems of domestic political management, reducing external economic dependency, redistributing wealth, creating employment, and extending social services. Introduction to general theoretical works on Latin American politics and development first quarter. Intensive study of Chile and Cuba in second quarter. *Prerequisite: P.S. 11 or consent of instructor for 134AA; P.S. 134AA for 134AB.*

### 134B. Politics in Mexico (4)

(Formerly P.S. 183) General survey of the Mexican political system as it operates today. Emphasis on sources of stability and instability in the contemporary Mexican state, relationships between the state and various segments of Mexican society (economic elites, peasants, urban labor, and the Church); Mexico's international economic relations, including its massive indebtedness to foreign banks. *Prerequisite: P.S. 11 or consent of instructor.*

### 134D. Selected Topics in Latin American Politics (4)

(Formerly P.S. 131) A comparative analysis of contemporary political issues in Latin America. Material to be drawn from two or three countries. Among the topics: development, nationalism, political change. *Prerequisite: P.S. 11 or consent of instructor.*

### 134G. Politics in the Andes (4)

A comparative examination of twentieth-century political conflicts and currents in the Andean countries of South America: Bolivia, Colombia, Ecuador, and Peru. Topics include economic underdevelopment, Indian relations, militarism, guerrilla warfare, and revolutionary movements. *Prerequisite: P.S. 11 or consent of instructor.*

### 134I. Politics in the Southern Cone of Latin America (4)

This course is a comparative analysis of twentieth-century political developments and issues in the Southern Cone of Latin

America: Argentina, Chile, and Uruguay. The course will also examine the social and economic content and results of contrasting political experiments. *Prerequisite: P.S. 11 or consent of instructor.*

### 134J. Labor and Politics in Latin America (4)

The course explores the relationships between labor movements and the state, political parties, ideologies, and economic change in Latin America. Is organized labor in Latin America captive or powerful? Does it mobilize for stasis or change? Complex answers derived from a survey of cases and models describing workers' participation in Latin American politics. *Prerequisite: P.S. 11 or consent of instructor.*

### 134N. Politics in Central America (4)

Focused examination of political conflict in one or more countries of the region, emphasizing issues, ideology, and process in grassroots political organization. Limited coverage of international politics. *Prerequisite: P.S. 11 or consent of instructor.*

### 134P. Organizing Women in Latin America (4)

Survey of women's participation in formal political institutions in Latin America (public bureaucracies, political parties, trade unions, peasant organizations), the politics of gender in recent women's movements, and the impact on women of democratization and neoliberal economic policies. *Prerequisite: P.S. 11 or consent of instructor.*

### 134Q. Organization, Resistance, and Protest in Latin America (4)

Comparative, case-based study of historical and contemporary political organizations and social movements in Latin America. Emphasis on local and regional activism through politicized urban neighborhood and church groups, trade unions, and peasant organizations. Focus on group objectives, strategies, and identities. *Prerequisite: P.S. 134AA or consent of instructor.*

### 135A. Ethnic Conflict in the Third World (4)

(Same as ETHN 157.) A comparative analysis of ethnic conflict and of conflict resolution by consociational methods in Lebanon, Cyprus, Malaysia, Burundi, and South Africa. Comparisons will also be made with the United States, other Western countries, and other Third World countries. *Prerequisite: P.S. 11 or consent of instructor.*

### 136B. Comparative Politics and Political Culture (4)

This course is designed to provide undergraduates with a sound introduction to cultural interpretations of power and politics. The course will also attempt to render an explicit account of the process of theory formation in social science. Special attention will be given to Africa and Asia. *Prerequisite: P.S. 11 or consent of instructor.*

### 137A. Comparative Political Parties and Interest Groups (4)

This course serves as an introduction to the comparative study of political parties and interest groups. The course has three parts: 1) an analytical introduction to parties, interest groups, and their role in democratic representation; 2) parties and interest groups in Great Britain; and 3) parties and interest groups in Italy.

### 138A. The Political Economy of Urbanization (4)

(Formerly P.S. 188) The central theme of this course is public policy and its relationship to the spatial distribution of population and wealth. Case materials are drawn from the experience of Latin American and African countries, with comparative reference to selected Asian nations, the U.S., and Western Europe. *Prerequisite: P.S. 11 or consent of instructor.*

### 138D. Special Topics in Comparative Politics (4)

An undergraduate seminar designed to give students who have already had some course experience in upper-division comparative politics an opportunity to study some aspect of current comparative politics in greater depth in a small group setting. *Prerequisite: P.S. 11 and two upper-division courses in comparative politics.*

### 139A. Politics of the Ancient World Order (4)

An introduction to the domestic and international political orders of the ancient West. Primary focus will be on the strengths and limitations of comparative and international relations theories when applied to the ancient world of city-states, kingdoms, and empires. *Prerequisite: P.S. 11 or 12 or consent of instructor.*

### 139B. Politics of the Ancient World Order (4)

A continuation of 139A examining the domestic and international political orders of the ancient West. *Prerequisite: P.S. 11, 12, or 139A.*

## INTERNATIONAL RELATIONS

### 140B. Concepts and Aspects of Revolution (4)

Introduction to the analytical and comparative study of revolutionary movements and related forms of political violence. Topics include: the classical paradigm; types of revolutionary episodes; psychological theories; ideology and belief systems; coups; insurgencies; civil wars; terrorism and revolutionary outcomes. *Prerequisite: P.S. 12 or consent of instructor.*

### 141. Seminar: Game Theory and International Relations (4)

This course covers the rudiments of game theory and its use in the study of international relations to explore various substantive and theoretical issues. *Prerequisites: P.S. 12 and one upper-division course in international relations.*

### 142A. United States Foreign Policy (4)

United States foreign policy from the colonial period to the present era. Systematic analysis of competing explanations for U.S. policies—strategic interests, economic requirements, or the vicissitudes of domestic politics. Interaction between the U.S., foreign states (particularly allies), and transnational actors are examined. *Prerequisite: P.S. 12 or consent of instructor.*

### 142I. National and International Security (4)

A survey of theories of defense policies and international security. *Prerequisite: P.S. 12 or consent of instructor.*

### 144AA-AB. Politics and the International Economic Order (4-4)

(Formerly P.S. 155A-B) This course examines the interplay of politics and economics in international relations. The first quarter entails a review of the history of the international economic order from the seventh century through the present. Stress is placed on the evolution of the bargaining about money, trade, and investment. The second quarter will consider major theories purporting to explain and predict the workings of the international order from the point of view of political economy. An extended discussion of one aspect of the economic order (e.g., the multinational corporation) will serve as the test case. *Prerequisites: P.S. 12 for 144AA and one quarter of economics are recommended; prerequisite for P.S. 144AB, consent of instructor.*

### 144D. Political Dimensions of International Finance (4)

(Conjoined with P.S. 262, IP/Gen 402, and IP 202.) Examination of effects of national policies and international collaboration of public and private international financial institutions, in particular management of international debt crisis, economic policy coordination, and the role of international lender of last resort.

### 145B. Conflict and Cooperation in International Politics (4)

Seminar on how countries overcome problems of conflict and cooperation in their dealings with one another. Focuses on theories of emergence of cooperation among states and applies these to various issue-areas. Subjects examined include international monetary relations, military alliances, economic sanctions, human rights, arms control, international trade, and others. *Prerequisite: P.S. 12.*



**146A. The U.S. and Latin America: Political and Economic Relations (4)**

(Formerly P.S. 185) Two central issues in U.S. relations with Latin America will be explored: 1) U.S. policies toward revolutionary and authoritarian regimes in the region; 2) changes in Latin American economic dependence on official aid and private investments from the U.S. These issues will be studied in historical perspective, looking toward policy issues for the 1980s and also at current problems in U.S. relations with two or three selected Latin American countries. (Offered in alternate years with P.S. 146C.) *Prerequisite: P.S. 11, 12 or consent of instructor.*

**146D. Political Parties in Latin America (4)**

Compares and contrasts different types of political parties in Latin America: conservative, liberal, populist, Christian democrat, socialist, and communist. Investigates their origins, ideologies, programs, leadership, followings, organizations, and successes or failures within varying political systems in different countries. *Prerequisite: P.S. 11 or consent of instructor.*

**147A. Soviet Foreign Policy**

This course analyzes Soviet international behavior over seven decades, with particular attention to the period of Soviet superpower status. We will give close attention to competing explanations for Soviet behavior, to the diverging assessments of Soviet power, and to specific modes of Soviet behavior such as weapons procurement, military intervention, and arms control compliance. *Prerequisite: P.S. 12 or consent of instructor.*

**148A. Japan in the World Economy (4)**

This course will examine the challenge of the new form of capitalism as developed in Japan. Historical, economic, and political perspectives will be included. *Prerequisite: PS 11 or 12.*

**150A. Immigration Policy and Politics (4)**

(Same as ETHN 158.) Comparative analysis of attempts by the U.S., western Europe, and Japan to initiate, regulate, and restrict immigration from Third World, 1940 to present. Social and economic factors shaping immigration policies, anti-immigrant movements, and political parties in industrialized countries. *Prerequisite: upper-division status.*

**151. Seminar: Theories of International Relations (4)**

This course will examine the efforts to develop models and theories of international relations from Hobbes to the present. Theories and approaches will be studied through analysis of current and historical cases. *Prerequisite: P.S. 11 and 12 and consent of instructor.*

**152. Comparative Foreign Policy (4)**

This upper-division course focuses on the comparative study of foreign policies in contemporary and historical world affairs. Competing theoretical approaches drawn from international, domestic, and individual levels of analyses will be examined. War, security, alliances, and international crises will be used to evaluate the utility of competing approaches. *Prerequisite: P.S. 12.*

**■ POLICY ANALYSIS**

**160AA. Introduction to Policy Analysis (4)**

This course will explore the process by which the preferences of individuals are converted into public policy. Also included will be an examination of the complexity of policy problems, methods for designing better policies, and a review of tools used by analysts and policy makers. *Prerequisite: P.S. 10 or consent of instructor.*

**160AB. Introduction to Policy Analysis (4)**

In this course, students will use their knowledge of the political and economic foundations of public policy making to conduct research in a wide variety of public policy problems. *Prerequisite: P.S. 160AA.*

**161. Understanding Direct Legislation (4)**

The purpose of the course is to examine how the referendum, initiative, and recall (direct legislation) are used to determine policy. The class will survey the historical and contemporary direct legislation literature in order to understand the popular and academic debate concerning direct legislation's use. *Prerequisite: P.S. 10 or consent of instructor.*

**162AC. Technology and Society (4)**

Policy issues raised by biomedical-scientific advances. The topical context varies from year to year. Included are such areas as intervention in human heredity and development, regulatory policy with respect to cancer and human population problems. Emphasis is on mechanisms for interaction of scientific expertise and other perspectives in policy making.

**166D. Marine Policy (4)**

This course aims to provide a theoretical and factual framework for the study of marine policy and to examine several cases involving controversial issues. Among the issues: the porpoise-tuna controversy; manganese nodules and deep sea mining; coastal management and nuclear power; and liability for oil spills. *Prerequisite: upper-division standing or consent of instructor.*

**166F. The American Welfare State (4)**

This course examines the building of the welfare state in the twentieth century. Topics include the legacy of progressivism, the New Deal and Great Society; Reaganite retrenchment; social programs, party and electoral dynamics; and the welfare state's impact on groups and the class structure. *Prerequisite: P.S. 10 or consent of instructor.*

**167A-B. Seminar: Public Policy Analysis (4-4)**

Students are asked to analyze various policy options related to contemporary American policy issues. Students are also required to do directed research on policy issues, to write case analyses based on their findings, and to debate policy alternatives in class. *Prerequisites: PS 160 AA-AB, or PS 102B or PS 100G.*

**■ RESEARCH METHODS**

**170A. Quantitative Political Science**

This course is an advanced introductory course for undergraduates. It will acquaint students with statistical methodology as it is used in the social sciences. It is assumed that the student has the mathematical aptitude to progress through the materials a bit faster than in a true introductory course. *Prerequisite: Social Science 60 or equivalent or consent of instructor.*

**180. Advanced Topics in Political Science (4)**

A focused seminar survey of selected theories, concepts, and methods within each of four fields of political science: American politics, comparative politics, international relations, and political theory. Taught in sections by field. Intended for juniors considering an honors thesis or seniors. *Prerequisites: P.S. 10, 11, and 12. GPA minimum 3.3 or consent of instructor.*

**■ SPECIAL STUDIES**

**191A-B. Senior Honors Seminar: Frontiers of Political Science (4-4)**

This course will be taught jointly by the staff of the department with occasional lectures by visitors. It is open only to seniors interested in qualifying for departmental honors. Admission to the course will be determined by the department on the basis of the student's academic record. Each student enrolled will be required to write an honors essay under the supervision of a member of the faculty. This essay, which is to be submitted by the end of the winter quarter, will be the basis of the final grade for the course. *Prerequisites: senior standing, GPA of 3.5 in political science, or consent of the department.*

**195. Teaching Apprentice-Undergraduate (4)**

Teaching and tutorial activities associated with courses and seminars. Only four units of 195 may be used for satisfying the department major requirement.

**198. Directed Group Study (2 or 4)**

Directed group study in an area not presently covered by the departmental curriculum. (P/NP grades only.)

**199. Independent Study for Undergraduates (2 or 4)**

Independent reading in advanced political science by individual students. (P/NP grades only.) *Prerequisite: consent of instructor.*

**GRADUATE**

All graduate courses are categorized as either seminars or independent study.

**■ SEMINARS**

**201. Political Theory: Themes and Texts (4)**

An analysis of important political theorists and their themes. Readings from Machiavelli, Hobbes, Walzer, Locke, Nozick, Rousseau, Rawls, Nietzsche, and Foucault. Themes include representation and citizenship, ownership and rights, authority and individualism. This course is required of all graduate students in political science. No prior graduate work in political theory is presupposed. *Prerequisite: graduate standing or consent of instructor.*

**202. Designing Political Research (4)**

The theory and practice of research in political science. This course examines the major approach to the study of politics represented by significant works in the discipline. It considers how interesting and important questions are discovered and how research appropriate to them is designed and executed.

**210A. Systems of Political Thought (4)**

(Formerly P.S. 200A) This course focuses on the development of politics and political thought in ancient Greece, its evolution through Rome, and the rise of Christianity. Readings are drawn from Plato, Aristotle, and Machiavelli. Students will attend lectures and carry out research and writing assignments designed for graduate students.

**210DC. Contemporary Political Theory (4)**

This seminar focuses on selected theorists and topics since the mid-nineteenth century. Theorists will include Nietzsche, Max Weber, Lenin, Freud, and Foucault. Topics will include authority, power, and political leadership. May be repeated once with instructor's consent. Students will meet with P.S. 110DC and hold a separate discussion section.

**211. Marx and Marxism (4)**

The course approaches three questions: What is the nature and import of Marx's contribution to social theory and social science? What does it mean to analyze the world as a Marxist? What principles of economic and political organization are explicit and/or implicit with Marxism? Requirements: five short papers plus a final exam, OR, with approval of the instructors, three short papers and a twenty-page paper. *Prerequisite: graduate standing.*

**212. Political Thought: Machiavelli to Rousseau (4)**

This course will review major texts and selected commentaries in the history of political thought as preparation for the field examination. Readings will include Machiavelli, Hobbes, Locke, and Rousseau. *Prerequisite: graduate standing.*

**213. Political Thought: Kant to Nietzsche (4)**

This course will review major texts and selected commentaries in the history of political thought as preparation for the field examination. Readings will include Kant, Hegel, Marx, Mill, and Nietzsche. *Prerequisite: graduate standing.*



**219. Special Topics in Political Theory (4)**

This seminar is an examination of the different approaches to the study of political theory. Issues and research areas will vary each time the course is offered. *Prerequisite: graduate standing or consent of instructor.*

**220. Comparative Politics: State and Society (4)**

This course will provide a general literature review in comparative politics to serve as preparation for the field examination. *Prerequisite: graduate standing in any discipline in the social sciences or humanities, or consent of instructor.*

**221. Comparative Politics: Institutions (4)**

This is a second course in comparative politics designed as a preparation for the field examination. It will focus on the comparative study of political institutions. *Prerequisite: graduate standing in any discipline in the social sciences or humanities, or consent of instructor.*

**225. The Politics of Divided Societies (4)**

Research seminar that surveys the theoretical literature on divided societies in Africa, Asia, Europe, North America, and South America, particularly conflict and peacemaking in multi-ethnic countries. Cases to be studied in depth will be selected in accordance with students' area and country interests. *Prerequisite: graduate standing or consent of instructor.*

**229. Special Topics in Comparative Politics (4)**

This seminar is an examination of the different approaches to the study of comparative politics. Issues and research areas will vary each time the course is offered. *Prerequisite: graduate standing or consent of instructor.*

**230A-B. The Mexican Political System (4-4)**

An interdisciplinary graduate seminar covering selected aspects of Mexican politics, economic development, and social change. Attention to both domestic and international factors affecting Mexico's political economy. Material to be drawn from literatures in anthropology, economics, history (twentieth century), political science, sociology, urban studies, and communications. Topics vary from year to year, partly reflecting research interests of participating students. Students are expected to write substantial research papers or thesis proposals, in consultation with instructor, home department advisers, and visiting scholars in residence at the Center for U.S.-Mexican Studies.

**231. Soviet Politics (4)**

A colloquium surveying the major controversies in Sovietology. *Prerequisite: graduate standing or consent of instructor.*

**232. The Chinese Political System (4)**

The evolution of political institutions and processes in the People's Republic of China. We will examine the changing roles of the leader, the Communist Party, the government, the army; the shifting authority relations between central and local governments; and changing patterns of citizen behavior. *Prerequisite: graduate standing or consent of instructor.*

**233. Politics and Political Economy in Contemporary Japan (4)**

Japanese politics in theoretical and comparative perspective. Topics covered may vary from year to year, and include the dynamics of the party system, the influence of international economic integration on policy making and the nature and evolution of democracy in Japan. *Prerequisite: graduate standing or consent of instructor.*

**234. Politics, Economics, and Socialism (4)**

This course examines how economic structures and behavior affect political institutions and how political institutions and actions affect economic structures and behavior in socialist countries. Focus primarily on socialist/communist states, but reference will be made to communist parties and the dynamics of the public sector in nonsocialist countries as well. *Prerequisite: graduate standing.*

**235A. Latin American Politics (4)**

(Conjoined with IP/Gen 477 and IP 277.) Introductory reading seminar on Latin American politics to acquaint students with leading schools of thought, provide critical perspective on premises and methodology, and identify themes for further inquiry. Themes include authoritarianism, revolution, democratization, regional conflict, and the emergence of middle-level powers. *Prerequisite: graduate standing or consent of instructor.*

**235B. Regime Transformation in Latin America (4)**

This seminar will focus on processes of regime transformation in Latin America, with particular emphasis on recent patterns of democratization. The goals will be to explore the current literature, to examine its theoretical foundations, to identify unresolved questions, and to frame topics for further research. *Prerequisite: graduate standing or consent of instructor.*

**236. Immigration Policy and Politics (4)**

An interdisciplinary seminar covering origins, consequences, and characteristics of worker migration from Third World countries (especially Mexico, Central America, and the Caribbean basin) to the United States, from the nineteenth century to the present.

**237. Grassroots Organizations and Political Change (4)**

Comparative studies of subnational political organizations and their capacity for effecting political change and influencing public policy. Topics may include new social movements, trade unions, peasant movements, politicized church groups, urban neighborhood organizations, and women's groups. Organized around case studies and competing theoretical approaches. Cases will vary and emphasize contemporary Latin America. *Prerequisite: graduate standing.*

**241. International Relations (4)**

This course will provide a general literature review in international relations to serve as preparation for the field examination. *Prerequisite: graduate standing in any discipline in the social sciences or humanities, or consent of instructor.*

**242. Theory of International Relations: The Unit in the International System (4)**

This course reviews the literature on the role of states and other actors in the international system. Issues to be discussed include: the domestic sources of foreign policy, and the degree to which changes in the characteristics of the units of a system can change the system itself. *Prerequisite: graduate standing.*

**243. International Security (4)**

A colloquium surveying the major theoretical controversies in the study of international and national security. *Prerequisite: graduate standing or consent of instructor.*

**248. Special Topics in International Relations (4)**

This seminar is an examination of the different approaches to the study of international relations. Issues and research areas will vary each time the course is offered. *Prerequisite: graduate standing or consent of instructor.*

**250. American Politics (4)**

This course will provide a general literature review in American politics to serve as preparation for the field examination. *Prerequisite: graduate standing in any discipline in the social sciences or humanities, or consent of the instructor.*

**251. American Political Institutions (4)**

A critical examination of major contributions to the theoretical and empirical literature on the U.S. Congress, presidency, and federal bureaucracy. *Prerequisite: graduate standing or consent of instructor.*

**252. American Politics: Behavior**

Theoretical and empirical perspectives on voting and other forms of political participation, parties, interest groups, and public opinion in the United States. *Prerequisite: graduate standing or consent of instructor.*

**254. American Political Development (4)**

This course examines the historical evolution of the American state with particular attention to theories of political development. Special topics include the development of the party system, electoral and policy realignments, and the evolution of national political institutions. *Prerequisite: graduate standing in any discipline of the social sciences or humanities or consent of instructor.*

**255. Subnational Government (4)**

Concentrating on the United States, students in this course will examine theories of federalism; the role of sections or regions in American political development; the political development of state governments and their current role in governance; the political development of cities and their place in U.S. politics. *Prerequisite: graduate standing or consent of instructor.*

**259. Special Topics in American Politics (4)**

This seminar is an examination of the different approaches to the study of American politics. Issues and research areas will vary each time the course is offered. *Prerequisite: graduate standing or consent of instructor.*

**260. Political Economy: Institutional Change (4)**

This advanced seminar will focus on attempts to use economic theory in comparative and American politics. The micro foundations of macro models will be stressed. *Note: undergraduates may take this course only with the consent of the instructor and completion of P.S. 112A.*

**260AA. Policy Analysis (4)**

This course reviews the process involved in converting the preferences of individuals into public policy as well as the methods and tools used by analysts and policy makers. *Prerequisite: graduate standing.*

**260AB. Introduction to Policy Analysis (4)**

This course will emphasize the political and organizational problems of designing and implementing public policies. Students will attend lectures and carry out research and writing assignments designed for graduate students.

**262. Political Dimensions of International Finance (4)**

Examination of effects of national policies and international collaboration of public and private international financial institutions, in particular management of international debt crises, economic policy coordination, and the role of international lender of last resort. *Prerequisite: graduate standing.*

**269. Special Topics in Political Economy (4)**

This seminar is an examination of the different approaches to the study of political economy. Issues and research areas will vary each time the course is offered. *Prerequisite: graduate standing or consent of instructor.*

**270A. Quantitative Methods in Political Science (4)**

This is a reading and discussion seminar for graduate students in political science and other social-science disciplines. Its purpose is to acquaint participants with some basic trends in quantitative research and to exercise critical faculties. An analytical critique of approximately ten-twelve pages will be required. *Prerequisite: graduate standing in any discipline in the social sciences or humanities or consent of instructor.*

**271A-B. Advanced Statistical Applications (4-4)**

Use of advanced quantitative techniques in political science. Students will use political science data to complete small exercises and a major project. *Prerequisites: PS 270A for 271A, 271A for 271B.*

**272. Historical Methods in Political Science (4)**

This seminar explores various methodologies employed in the historical study of politics. It focuses upon specific substantive controversies, e.g., the changing nature of electoral politics, political recruitment and careers, social mobility, and acquaints students with appropriate methodologies and statistical techniques.



**273. Game Theory and Political Applications (4)**  
Introduction to the use of formal models in political science including game theory and social choice theory. Course will provide preparation for the field examination.

**274. Axiomatic Social Choice Theory (4)**  
An introduction to some of the central issues in the axiomatic approach to social choice initiated by Arrow's *Social Choice and Individual Values*. Because of the many complexities that underly an analysis of social choice, the course will be quite technical in nature. *Prerequisite: PS 250 or consent of instructor.*

■ **INDEPENDENT STUDY**

**291A. Research Tutorial in American Politics (4)**  
Tutorial in a selected area of American politics leading to a research paper. The content of each tutorial will be determined by the professor. *Prerequisite: graduate standing in political science.*

**291B. Research Tutorial in Comparative Politics (4)**  
Tutorial in a selected area of comparative politics leading to a research paper. The content of each tutorial will be determined by the professor. *Prerequisite: graduate standing in political science.*

**291C. Research Tutorial in International Relations (4)**  
Tutorial in a selected area of international relations leading to a research paper. The content of each tutorial will be determined by the professor. *Prerequisite: graduate standing in political science.*

**291D. Research Tutorial in Political Theory (4)**  
Tutorial in a selected area of political theory leading to a research paper. The content of each tutorial will be determined by the professor. *Prerequisite: graduate standing in political science.*

**292. Directed Reading in Comparative Politics (4)**  
Directed reading in a selected area of comparative politics for graduate students. The content of each reading course is to be decided by the professor directing the course with the approval of the graduate student's supervisory committee.

**293. Directed Reading in International Relations (4)**  
Directed reading in a selected area of international relations for graduate students. The content of each reading course is to be decided by the professor directing the course with the approval of the graduate student's supervisory committee.

**294. Directed Reading in Political Economy (4)**  
Directed reading in a selected area of political economy for graduate students. The content of each reading course is to be decided by the professor directing the course with the approval of the graduate student's supervisory committee.

**295. Directed Reading in American Politics (4)**  
Directed reading in a selected area of American politics for graduate students. The content of each reading course is to be decided by the professor directing the course with the approval of the graduate student's supervisory committee.

**296. Directed Reading in Political Theory (4)**  
Directed reading in a selected area of political theory for graduate students. The content of each reading course is to be decided by the professor directing the course with the approval of the graduate student's supervisory committee.

**298. Directed Reading (1-12)**  
Guided and supervised reading in the literature of the several fields of political science.

**299. Independent Research (1-12)**  
Independent work by graduate students engaged in research and writing of second-year paper and doctoral dissertation, under direct supervision of adviser.

**500. Apprentice Teaching (1-4)**  
A course in which teaching assistants are aided in learning proper teaching methods by means of supervision of their work by the faculty: handling of discussions, preparation, and grading of examinations and other written exercises, and student relations. Twenty-four units of teaching apprenticeship meets the department teaching requirement for the Ph.D. degree.

▼ **PSYCHOLOGY**

ADMINISTRATIVE OFFICE: 5217 McGill Hall,  
Muir College  
STUDENT SERVICES OFFICE: 1533 McGill Hall  
Annex

**Professors**

- Norman H. Anderson, Ph.D.
- Stuart M. Anstis, Ph.D.
- Richard C. Atkinson, Ph.D., *Chancellor*
- Elizabeth A. Bates, Ph.D.
- Michael Cole, Ph.D.
- Diana Deutsch, Ph.D.
- J. Anthony Deutsch, D.Phil.
- Ebbe B. Ebbesen, Ph.D.
- Edmund J. Fantino, Ph.D.
- Vladimir J. Konecni, Ph.D.
- Donald I.A. MacLeod, Ph.D.
- George Mandler, Ph.D.
- Jeffrey O. Miller, Ph.D.
- Vilayanur S. Ramachandran, Ph.D., M.B.B.S.
- David A. Swinney, Ph.D.
- Laura E. Schreibman, Ph.D., *Chair*
- Ben A. Williams, Ph.D.

**Associate Professors**

- James A. Kulik, Ph.D.
- Harold E. Pashler, Ph.D.
- Joan Stiles, Ph.D.

**Assistant Professors**

- Gordon C. Baylis, D.Phil.
- Nicholas Christenfeld, Ph.D.
- Brett A. Clementz, Ph.D.
- Manuel F. Gonzalez, Ph.D.
- Judith C. Goodman, Ph.D.
- Allen M. Osman, Ph.D.
- John T. Wixted, Ph.D.

\* \* \*

- Ursula Bellugi, Ed.D., *Adjunct Professor of Psychology*
- Nelson M. Butters, Ph.D., *Professor in Residence, Psychiatry*
- Francis Crick, Ph.D., *Adjunct Professor of Psychology*
- Philip M. Groves, Ph.D., *Professor of Psychiatry*
- Steven A. Hillyard, Ph.D., *Professor of Neurosciences*

- George F. Koob, Ph.D., *Adjunct Professor of Psychology*
- William J. McGill, Ph.D., *Adjunct Professor of Psychology*
- John M. Polich, Ph.D., *Adjunct Associate Professor of Psychology*
- David S. Segal, Ph.D., *Professor of Psychiatry*
- Terrence J. Sejnowski, Ph.D., *Professor of Biology*
- Cheryl L. Spinweber, Ph.D., *Adjunct Associate Professor of Psychology*
- Larry R. Squire, Ph.D., *Professor In Residence, Psychiatry*
- Paul E. Touchette, Ph.D., *Adjunct Associate Professor of Psychology*

**THE UNDERGRADUATE PROGRAM**

**THE PSYCHOLOGY MAJOR PROGRAM**

The department offers courses in all major areas of experimental psychology, with emphasis in the areas of cognitive psychology and human information processing, sensation and perception, learning and behavior analysis, physiological psychology, developmental psychology, psycholinguistics, and social psychology. The department emphasizes research in the experimental and theoretical analysis of human and animal behavior. Students who major in psychology can expect to develop a knowledge of a broad range of content areas, as well as basic skills in experimental and analytic procedures.

**PREREQUISITES FOR PSYCHOLOGY MAJORS**

Experimental psychology uses the tools and knowledge of science: calculus, probability theory, computer science, chemistry, biology, statistics, and physics. Accordingly, students in upper-division courses must have an adequate background in these topics. Prerequisites for individual courses are specified in the catalog listings for the courses.

A B.A. degree in psychology will be granted if the following requirements have been met:

1. Three quarters of natural science other than psychology (i.e., biology, chemistry, and physics). This requirement should be fulfilled by taking *general introductory* courses in the physical sciences. Special topics courses within science departments (e.g., nutrition) will be accepted only if they had a general introductory course as a prerequisite and the student has satisfied this prerequisite before taking the special topics course.

## PSYCHOLOGY

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The following is a list of acceptable natural science courses offered at UCSD:

Biology: 1, 2, 3, 10, 12, 14, 16, 18

Chemistry: 4, 6A, 6B, 6C, 7A, 7B, 11, 12, 13

Physics: All the 1 and 2, 10, 11

2. Three quarters of formal skills, at least one of which must be calculus. The other two quarters may consist of any combinations of courses in calculus or logic. Acceptable calculus courses include Math. 1A-B-C and Math. 2A-B-C. Acceptable logic courses include Philosophy 10 and 12.

3. Introduction to computer programming (CSE 62A, CSE 62B, CSE 65, AMES 5 or AMES 10 at UCSD, or equivalent). Other courses will be accepted only if they are primarily concerned with programming in a high-level computer language.

All of these courses may be taken Pass/No Pass.

4. One quarter of statistics (Psychology 60, Economics 120A, Social Science 60, Math. 6A, or equivalent). Statistics must be taken for a letter grade.

Students should complete these prerequisite requirements by the end of the sophomore year.

### MAJOR REQUIREMENTS

A minimum of **twelve** upper-division courses in psychology are required. Upper-division courses must be taken for a grade to count toward the major. Neither Psychology 199 nor Internship 197 can be counted toward the major, and Psychology 195 may be counted only once. Upper-division psychology courses taken on a Pass/No Pass basis prior to declaring as a psychology major cannot be used to satisfy a major requirement. Graduate research seminars (usually designated as "Special Topics in . . .") cannot be counted toward the major. **A minimum of six upper-division courses must be taken at UCSD.** A grade-point average of at least 2.0 in the upper-division courses is required for graduation.

For students beginning their major in 1989-90, or later, there are specific course requirements in addition to the overall requirement of twelve upper-division courses. The specific course requirement is satisfied by taking **five of the following six courses: Psychology 101, 102, 103, 104, 105, 106.** These courses are broad introductions to the major areas of psychology represented in the department. These requirements do not apply to students who have declared their major prior to fall 1989.

The remaining courses of the twelve-course requirement may be any other courses offered in the Department of Psychology. For the conve-

nience of students who wish to pursue an area in depth, the courses are listed below according to the major areas to which they relate. Note that some courses are listed under more than one area; others are not listed under any area (e.g., Psychology 166: History of Psychology). Note also that the more advanced courses typically have as prerequisites one or more courses numbered 101-106. Students interested in pursuing a particular area in depth are strongly encouraged to contact a faculty adviser in that area.

### COGNITION

Psychology 105	Psychology 145
Psychology 115	Psychology 148
Psychology 129	Psychology 152
Psychology 136	Psychology 156
Psychology 137	Psychology 158

### DEVELOPMENT

Psychology 101	Psychology 145
Psychology 117	Psychology 156
Psychology 128	Psychology 167
Psychology 136	Psychology 168

### LEARNING AND BEHAVIOR ANALYSIS

Psychology 103	Psychology 146
Psychology 120	Psychology 154
Psychology 121	Psychology 168

### PHYSIOLOGICAL PSYCHOLOGY

Psychology 106	Psychology 159
Psychology 129	Psychology 172
Psychology 137	Psychology 179
Psychology 152	Psychology 181

### SENSATION AND PERCEPTION

Psychology 102	Psychology 138
Psychology 116	Psychology 159
Psychology 129	

### SOCIAL PSYCHOLOGY

Psychology 104	Psychology 155
Psychology 127	Psychology 158
Psychology 148	Psychology 162
Psychology 149	

### ADVISING

All students are strongly encouraged to choose a permanent adviser. Advisers are assigned at the Student Services Office (Room 1533, Psychology and Linguistics Annex) when the student announces his or her intention to major. The student then plans his or her major program with the aid of the adviser. Such planning should take place in the student's sophomore year or as soon as possible thereafter.

### PREPARATION FOR GRADUATE SCHOOL

Regardless of the area of specialization that a student chooses to pursue, it is strongly advised that he or she obtain a strong general background in psychology, a strong background in statistics and experimental methods, and a strong background in research, including laboratory courses and independent research. A recommended program of study to accomplish these goals is the following:

1. At least five courses from the group numbered Psychology 101-106
2. At least one (and preferably more) laboratory course(s) (Psychology 115, 116, 117, 121, 127)
3. Introduction to Statistics and Advanced Statistics (Psychology 60 and 111)
4. The Senior Independent Research Project (Psychology 194A-B-C)

### PREPARATION FOR CLINICAL PSYCHOLOGY

The above program is recommended for all students planning to go on to graduate school, including those interested in a clinical graduate program. Experience in research methodology and a general knowledge of psychology are considered the most important features of a strong major in psychology, and are preferred over a large number of courses in one particular area. Undergraduate courses in clinical psychology are offered at UCSD, but primarily by temporary lecturers (which results in their not being listed in the catalog; information regarding such courses can be obtained from the department office). Students are strongly advised **not** to take a large number of such courses in lieu of the recommended program of study listed above.

### HONORS PROGRAM

Students are encouraged to participate in the department honors program. Requirements for the program, in addition to the prerequisite and major requirements listed above, are the following:

1. Advanced Statistics (Psychology 111)
2. At least one laboratory course (Psychology 115, 116, 117, 121, 127) or one Psychology 199 course. Psychology 199 can be used to replace the laboratory course BUT it will not COUNT as one of the required twelve courses.
3. The two-quarter Honors Seminar (Psychology 110A and B)
4. A year-long independent research project (Psychology 194A-B-C) that culminates in an honors thesis.



Admission to the honors program is granted by application to the Department of Psychology in the fall quarter of the student's junior year. The application deadline is October 25. Such admission is required for registration in Psychology 110A-B (the Honors Seminar) which is offered in the winter and spring quarters. Upon admission, students will be assigned a permanent adviser, who will work closely with the student in the remaining quarters of the major.

Successful completion of the honors program requires a grade of A in Psychology 194 and a minimum grade-point average of 3.5 for courses taken in the major.

The honors program is strongly recommended for all students interested in graduate schools.

### **UNDERGRADUATE MAJOR PROGRAM IN COGNITIVE SCIENCE**

With the formation of the new Department of Cognitive Science, the previous cognitive science major within psychology is no longer in effect. Students who wish to major in cognitive science should see the catalog materials for that department. Students who began their cognitive science major prior to the 1989-90 year and wish to continue their major in psychology may do so. Additional information about either the cognitive science major from the Department of Cognitive Science or the cognitive science major within the Department of Psychology may be obtained from the office of the Department of Cognitive Science.

### **THE MINORS PROGRAM**

#### **THE NONCONTIGUOUS MINOR FOR REVELLE COLLEGE**

Students may enroll in psychology courses in order to fulfill the requirements of the noncontiguous minor. The noncontiguous minor will normally consist of three of the lower-division courses in psychology and three courses selected from the upper-division offerings of the department. Please note carefully the prerequisites for the upper-division courses. Students who wish to pursue a noncontiguous minor should consult with one of the departmental undergraduate advisers before enrolling in these courses. Lower-division psychology courses may not be used simultaneously to satisfy both the social science requirement and the noncontiguous minor requirement.

#### **MINOR PROGRAM FOR THIRD COLLEGE**

Third College students may minor in psychology by completing a six-course sequence in psychology which must include at least three upper-division courses. At the beginning of their program planning, students should carefully examine the prerequisites for each of the courses to be used for the minor and consult with one of the departmental undergraduate advisers. Note in particular that introductory statistics (Psychology 60) is a prerequisite for almost all upper-division courses.

#### **MINOR PROGRAM FOR WARREN COLLEGE**

Warren College requires its students to complete two six-course sequences to fulfill the area-of-concentration requirements. Six of these twelve courses must be upper-division. A student may minor in psychology by choosing a six-course sequence, at least three courses of which must be upper-division.

#### **TRANSFER CREDIT**

In general, all introductory courses in scientific and/or experimental psychology are accepted for lower-division credit toward a psychology major or minor. Lower-division courses covering special topics in psychology (e.g., personal adjustment, human sexuality) will be accepted *only if*: 1) they had a general introductory course as a prerequisite, and 2) the student had satisfied this prerequisite before taking the special topics course. Upper-division psychology courses will be evaluated for transfer credit on a course by course basis.

#### **ELEMENTARY SCHOOL TEACHING**

A psychology major offers excellent preparation for teaching in the elementary schools. If you are interested in earning a California teaching credential from UCSD, contact the Teacher Education Program for information about the prerequisite and professional preparation requirements. It is recommended that you contact TEP as early as possible in your academic career.

#### **THE GRADUATE PROGRAM**

The Department of Psychology provides broad training in experimental psychology. Increased specialization and the general burgeoning of knowledge make it impossible to provide training in depth in every aspect of experimental psychol-

ogy, but most aspects are represented in departmental research.

#### **PREPARATION**

Apart from the general university requirements, the department generally expects adequate undergraduate preparation in psychology. A major in the subject, or at least a strong minor, is normally a prerequisite, but applicants with good backgrounds in such fields as biology and mathematics are also acceptable.

#### **LANGUAGE REQUIREMENTS**

There is no foreign language requirement.

#### **GRADUATE CURRICULUM**

All students must fulfill all course requirements—stated below—while registered as graduate students in psychology at UCSD. There may occasionally be exceptions granted to this rule. Requests for exception should be in the form of petitions from students and their advisers to the Committee on Graduate Affairs. It is in the best interest of the student if these petitions are forthcoming at the time of admission to the graduate program. In this way, the committee, the students, and their advisers will all be aware of the course requirements before any of them are taken.

#### **PROGRAM OF STUDY**

Courses are divided into five areas: cognitive (including attention, language, perception), developmental (including language acquisition), learning and behavior analysis (including basic and applied), sensory and physiological (including vision, audition and neurophysiology), and social (including health and law). The Graduate Affairs Committee provides an approved list of courses from these areas. In the first year of study, each student must fulfill the following four requirements:

1. Each student must fulfill a quantitative methods requirement, either by taking two quantitative methods courses approved by the Graduate Affairs Committee or by showing a satisfactory knowledge of these courses through an examination.
2. In addition to the quantitative methods requirement, each student is expected to take four proseminars and four approved courses from the list prepared by the Graduate Affairs Committee. All course work must be completed by the end of the third year.
3. Each first-year graduate student is required to submit a research paper on the project completed as part of a research practicum. The paper

should be comparable in style, length, and quality to papers published in the normal, refereed journals of the student's research area. (The publication manual of the American Psychological Association, third edition, 1983, gives an acceptable format.)

The research paper will be read and evaluated by the student's research adviser and by at least two other readers appointed by the graduate adviser.

The research paper is presented orally at a research meeting held at the end of the spring quarter. Attendance at this meeting is a requirement for the department's graduate students and faculty. Typically, each student is allowed ten minutes to present the paper, with a five-minute question period following the presentation.

4. A teaching requirement must be met. (See below.)

Students are evaluated by the entire faculty at the end of the academic year. The normal minimum standards for allowing a student to continue beyond the first year are completion of all department requirements, satisfactory completion of the first-year research project (including the oral presentation), a B+ average in the quantitative methods courses, and a B+ average in other course work.

Any student whose needs cannot be reasonably met with courses conforming to these guidelines is encouraged to petition the Graduate Affairs Committee. The petition should contain a specific list of courses and a statement of justification and must be approved by the student's adviser.

### **QUALIFYING EXAMINATION FOR THE PH.D. DEGREE**

The qualifying examination is divided into two sections to be taken separately by all students. *Part I* is the written examination. Each area within the department will be responsible for preparing a core list of readings that the members of the area feel ensures a comprehensive coverage of the main emphases of the field. At least 50 percent of this core list will be drawn from proseminar courses taken in the student's first year. All of the core readings will be available to graduate students at the end of their first year and will not be changed before their exam, in their third year. This list should contain the equivalent of approximately one major text and five review articles and will be updated at the beginning of each academic year.

There are seven areas that are possible options: cognitive, developmental, learning and behavior analysis, sensation and perception, social, physiological, and any outside area chosen by

the student and approved by the graduate affairs committee. Each student will choose three of the seven areas in the department upon which to be examined. For each area, the student will be responsible for reading the core list of material plus additional material consisting of specialized papers in the area that are agreed upon by the student and his or her adviser and committee members. These additional readings should consist of approximately half again as much reading as on the area core list. The student will also prepare nine questions (three per area) upon which he or she may be examined. These questions must be approved by the student's committee.

The examination will consist of three sections, one section for each area. In each area two-thirds of the examination will be prepared by the members of the area, and one question (presumably constituting one-third of the exam) will come from the student's list of prepared questions. The selection will be made by the student's committee members. Examination questions that are prepared by the faculty members will not be made available prior to the exam; however, a list of sample questions in the same format as those to be included on the exam will be provided for students taking the exam the first year. Students will have fifteen hours in which to complete the exam. This time will be split across three days. One area will be covered each day. The examination will be a sit-down, closed-book exam given twice during the academic year, once in September and once in March. Students are required to take the exam at least once by the fall quarter of their third year. The three sections will be blind graded by two faculty members in each area. The student may retake any or all sections of the exam up to three times; however, if the student decides to take the exam during his or her fourth year, the exam will be covering different readings. The student has the option of substituting a different area.

If the student does not pass all three sections by the end of his or her third year, the student may take the exam up until the spring of his or her fourth year, but the student will not qualify for a fee waiver and will be assessed educational fees. No outside examiners are involved in this part of the examination.

*Part II* of the qualifying examination is the defense of the dissertation proposal. This will normally follow *Part I* of the qualifying examination and will be an oral examination including outside examiners.

### **TEACHING**

Each student is required to participate in the teaching activities of the department. Students are required to serve as teaching assistants for one

quarter during their first year in the program and for two quarters during years two through four.

### **RESIDENCY**

Each student must complete the requirements for qualification for candidacy for the Ph.D. degree by the end of the third year of residence. Any student failing to qualify by this time will be placed on probation. A student who fails to qualify by the end of the spring quarter of the fourth year of residence will automatically be terminated from the department.

No student may allow more than eight calendar years to elapse between starting the graduate program and completing the requirements for the Ph.D. degree. Students will automatically be terminated from the program at the end of the spring quarter of their eighth calendar year in the department.

### **RESEARCH**

In each year of graduate study all students are enrolled in a research practicum (Psychology 270 in the first year; Psychology 296 in subsequent years). Students are assigned to current research projects in the department and receive the personal supervision of a member of the staff.

### **DEPARTMENTAL PH.D. TIME LIMIT POLICIES**

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed eight years. Total registered time at UCSD cannot exceed eight years.

## **Courses**

### **LOWER DIVISION**

#### **EXPERIMENTAL REQUIREMENTS**

Psychology at UCSD is a laboratory science. We are concerned with the scientific development of knowledge about human and animal behavior and thought. Accordingly, experience with experimental procedures plays an important role in the undergraduate and graduate training of students. Psychology majors must all learn experimental methods, including basic statistical techniques. Those in the honors program must take laboratory courses and also do a year-long undergraduate thesis.

### **LOWER-DIVISION STUDENTS**

Students enrolled in the lower-division courses must serve as experimental subjects for



participation in three hours per course. The requirement is intended to be a positive educational supplement to the course work. Part of each experimental session will be devoted to explanation and discussion of the purpose and nature of the experiment (this will usually be done at the end of the experimental session). Students always have the right to discontinue participation at any point in any study. Students who are unable to participate or who choose not to participate will be provided alternate service assignments which are designed to serve similar educational goals.

**1. Psychology (4)**

A comprehensive series of lectures covering the basic concepts of modern psychology in the areas of human information processing, learning and memory, motivation, developmental processes, language acquisition, social psychology, and personality.

**2. General Psychology: Biological Foundations (4)**

A survey of physiological and psychological mechanisms underlying selected areas of human behavior. Emphasis will be upon sensory processes, especially vision, with emphasis also given to the neuropsychology of motivation, memory, and attention.

**3. General Psychology: Cognitive Foundations (4)**

This course is an introduction to the basic concepts of cognitive psychology. The course surveys the areas of memory, perception, and thinking. The course also provides an introduction to the issues of cognitive development.

**4. General Psychology: Behavioral Foundations (4)**

This course will provide a basic introduction to behavioral psychology, covering such topics as classical conditioning, operant conditioning, animal learning and motivation, and behavior modification.

**5. Introduction to Abnormal Psychology (4)**

Introduction to the major theoretical orientations, important psychotherapeutic methods, selected disorders including anxiety, depression, schizophrenia, and psychosomatic disorders, and current issues in abnormal psychology.

**6. General Psychology: Social Foundations (4)**

This course will provide a basic introduction to social psychology, covering such topics as emotion, aesthetics, behavioral medicine, person perception, attitudes and attitude change, and behavior in social organizations.

**9. Brain Damage and the Mind (4)**

Issues to be covered include whether cognitive functions are localized or diffusely represented in the brain, the brain mechanisms of perception, memory, speech, thought, and movement, and the effects of damage to individual parts of the brain. (Not offered in 1992-93.)

**60. Introduction to Statistics (4)**

Introduction to the experimental method in psychology and to mathematical techniques necessary for experimental research. *Prerequisite: one year of mathematics or consent of instructor.*

**UPPER DIVISION**

**101. Introduction to Developmental Psychology (4)**

A lecture course on a variety of topics in the development of the child, including the development of perception, cognition, language, and sex differences. *Prerequisite: Psych. 60.*

**102. Introduction to Sensation and Perception (4)**

An introduction to problems and methods in the study of perceptual and cognitive processes. *Prerequisite: Psych. 60 or one year of college-level mathematics.*

**103. Introduction to Principles of Behavior (4)**

An example of the principles of conditioning and their application to the control and modification of human behavior.

**104. Introduction to Social Psychology (4)**

An intensive introduction and survey of current knowledge in social psychology. *Prerequisite: Psych. 60.*

**105. Introduction to Cognitive Psychology (4)**

Introduction to experimental study of higher mental processes. Topics to be covered include pattern recognition, perception, and comprehension of language, memory, and problem solving. *Prerequisite: junior standing.*

**106. Introduction to Physiological Psychology (4)**

Intensive introduction to current knowledge of physiological factors in learning, motivation, perception, and memory.

**110A-B. Honors Seminar in Psychology (4-4)**

This two-quarter sequence exposes honors students to contemporary research problems from all branches of experimental psychology. Weekly meetings consist of research seminars presented by different faculty members. Intensive reading and paper assignments are required. *Prerequisites: admission to Psychology Honors Program by application—a minimum overall GPA of 3.0 is required.*

**111. Advanced Statistics (4)**

Intermediate examination of the experimental method in psychology and mathematical techniques necessary for experimental research. *Prerequisite: minimum grade of B in either Psych. 60 or equivalent.*

**115. Laboratory in Cognitive Psychology (4)**

Lecture and laboratory work in human information processing. *Prerequisites: Psych. 105 and 111 or consent of the instructor.*

**116. Laboratory in Sensory Psychology (4)**

An introduction to the experimental measurement and analysis of auditory and visual phenomena. *Prerequisites: Psych. 159 (co-registration permitted) and Psych. 111. (Not offered in 1992-93.)*

**117. Laboratory in Developmental Psychology (4)**

The laboratory course in developmental psychology is designed around a series of intensive observational assignments, and one experimental project. Each observational assignment will include a lecture providing background on a major area in child development, a supervised structured observation, and a written laboratory report. *Prerequisite: Psychology 101.*

**120. Learning and Motivation (4)**

Survey of research and theory in learning and motivation. Includes instincts, reinforcement, stimulus control, choice, aversive control, and human application. *Prerequisite: upper-division standing.*

**121. Laboratory in Operant Psychology (4)**

Lecture and laboratory in operant psychology. *Prerequisite: must be taken with Psych. 120.*

**127. Methods in Applied Social Psychology (4)**

Emphasizes learning of experimental and quasi-experimental methodology applicable to social problems. Students carry out field research in areas such as the psychology of law (judicial decision making), traffic-related behavior (risk taking), environmental psychology, and other areas of student interest. *Prerequisites: Psych. 104 and 60.*

**128. Practicum in Child Development (4)**

This course is intended as a combined lecture and laboratory course for seniors in psychology and communication. Their backgrounds should consist of a solid background in general

psychology or communication and human information processing. The course will meet for two hours a week of lectures and discussion. Students will be expected to spend four hours a week of supervised, practical experience in a field setting involving children. An additional six hours of student time will be devoted to reading, transcribing field notes, and writing a paper on some aspect of the fieldwork experience as it relates to class lectures and readings. Evaluation of the course will be based on performance in classroom discussion, the judged quality of the students' fieldwork, and the quality of their term papers. *Prerequisites: Com/Gen 20 and Com/HIP 100, or a background in general psychology; upper-division standing or consent of instructor.*

**129. The Logic of Perception (4)**

This course is concerned with how we perceive the world. The lectures will cover three topics: a) the rich tradition of experimental work on perception that dates back to Helmholtz, b) discussion and criticisms of theories of perception including the view that perception is "intelligent" or "logical", c) recent physiological work on the visual pathways that may give us insights into neural mechanisms underlying perception. *Prerequisite: upper-division standing.*

**131. Personality Theory and Research (4)**

This course serves as an introduction to major theoretical approaches to the study of personality constructs and processes. Research advances in personality will be reviewed, and disturbances in personality development and functioning will be discussed and illustrated. The social learning theory perspective will be emphasized relative to other theoretical frameworks. *Prerequisite: upper-division standing.*

**136. Cognitive Development (4)**

An examination of the foundations and growth of mind, discussing the development of perception, imagery, concept formation, memory, and thinking. Emphasis is placed on the representation of knowledge in infancy and early childhood. *Prerequisite: Cog. Sci. 101B or Psych. 105 or Psych. 101.*

**137. Sleep and Dreaming (4)**

Psychological and physiological aspects of the human sleep/wake cycle and dreaming, including EEGs, drug effects, circadian rhythms, sleep disorders, and dream interpretation. *Prerequisite: upper-division standing.*

**138. Sound and Music Perception (4)**

Topics include the physiology of the auditory system, perception of pitch, loudness and timbre, localization of sound in space, perception of melodic and temporal patterns, handedness correlates, and musical illusions and paradoxes. There will be a substantial number of sound demonstrations. *Prerequisite: upper-division standing.*

**141. Evolution and Human Nature (4)**

This course will examine the question of whether important aspects of human behavior can be explained as a result of natural selection. The focus will be on sex differences, selfishness and altruism, homicide and violence, and context effects on human reasoning. *Prerequisites: upper-division standing and consent of instructor. (Not offered in 1992-93.)*

**145. Psychology of Language (4)**

This course will cover a number of basic research findings, theories, and issues concerning the recognition, comprehension, and production of language. *Prerequisite: Psych. 105. (Not offered in 1992-93.)*

**146. Theories of Conditioning and Learning (4)**

Primary emphasis will be on contemporary theoretical accounts of learning, based on research on Pavlovian and Instrumental Conditioning. *Prerequisite: Psychology 103 or equivalent.*

**147. Psychology of Student Protest (4)**

Course examines psychological factors operative in student protest movements of the 1960s, as distinct from political explanations commonly advanced. Among the forces considered:



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counterculture and alienation, frustration-aggression, oedipal mechanisms, situational stress, peer group pressures. *Prerequisite: upper-division standing.*

### **148. Psychology of Judgment and Decision (4)**

General theory of judgment-decision based on cognitive algebra. Empirical applications across all areas of psychology. *Prerequisite: Psych. 104 or Psych. 105.* (Not offered in 1992-93.)

### **149. Social Psychology and Dramatic Arts (4)**

This undergraduate seminar will explore the relationship between social psychology and drama, focusing especially on the use of psychological principles in plays (by playwrights) and their performance (by directors, actors, and choreographers). In addition to discussions and student presentations based on assigned readings, there will be videotaping sessions of students' scenework. *Prerequisites: major in psychology, minor in the theatre, or major in theatre, minor in psychology, or consent of instructor.*

### **150. Advanced Abnormal Psychology (4)**

In-depth study of selected psychopathological disorders (e.g., schizophrenia, affective disorders, personality disorders). Topics for discussion will change yearly. Students will gain an understanding of current theoretical research issues in psychopathology. The development of an independent research project will be required. *Prerequisites: A or B in Psych. 163 and consent of instructor.*

### **151. Test and Measurement (4)**

This course provides an introduction to psychological testing presented in three components: 1) psychometrics and statistical methods of test construction; 2) application of psychological tests in industry, clinical practice and other applied settings; and 3) controversies in the application of psychological tests. *Prerequisite: Psych. 60.* (Not offered in 1992-93.)

### **152. Brainwaves and Thought Processes (4)**

The relationships between human cognition and neural activity in terms of event-related brain potentials (ERPs) will be discussed. *Prerequisite: Psych. 105.*

### **153. Clinical Psychology (4)**

Topics to be covered include the major theoretical orientations in clinical psychology and the major types of psychotherapy (behavior modification, individual or group psychotherapy, play therapy, hypnosis, biofeedback and art therapy), legal and ethical issues involved in clinical practice. *Prerequisite: upper-division standing.*

### **154. Behavior Modification (4)**

Extension of learning principles to human behavior. In addition to discussion of the broad implications of a behavioral perspective, topics include methods of applied behavior analysis and applications of behavioral principles to clinical disorders and to normal behavior in various settings. *Prerequisites: Psych. 103 and/or Psych. 120.*

### **155. Social Psychology and Medicine (4)**

Explores areas of health, illness, treatment, and delivery of treatment that may be elucidated by an understanding of psychological concepts and research and considers how the psychological perspective might be enlarged and extended in the medical area. *Prerequisites: Psych. 60 or equivalent and Psych. 104.*

### **156. Cognitive Development in Infancy (4)**

This course examines perception and cognition in the first year of life. The focus is a critical evaluation of different theories of cognitive change in infancy. Methodological issues will be a central concern. *Prerequisites: Psych. 60 and 101.* (Not offered in 1992-93.)

### **158. Explorations of Human Nature (4)**

Lecture and discussion on psychological, biological, and social constraints on human psychology, with special emphasis on

consciousness and emotion and on topics in the evolution of mind and behavior. *Prerequisite: seniors majoring in psychology, anthropology, or philosophy.*

### **159. Physiological Basis of Perception (4)**

A survey of sensory and perceptual phenomena with emphasis on the physiological mechanisms underlying them. *Prerequisite: Psych. 102 or consent of instructor.*

### **162. Psychology and the Law (4)**

Research dealing with psychological factors in the legal system will be surveyed. Particular emphasis will be placed on applying psychological theory and methods to the criminal justice system in an attempt to understand the behavior of its participants. *Prerequisites: Psych. 60 and 104.*

### **163. Abnormal Psychology (4)**

This course is a comprehensive survey of the origins, characteristics, and causes of abnormal behavior. Particular attention is given to the biological and environmental causes of abnormality.

### **164. The Regulation of Food Intake (4)**

The course will cover the regulation of food intake from a physiological and behavioral point of view. Both the quantitative control of eating and specific appetites and pica will be discussed from an experimental point of view. *Prerequisites: Psych. 60 and 106.*

### **165. Explanation and Knowledge (4)**

Discussion of psychological theory and evidence on such topics as epistemology, ordinary language, reasons and causes, existence, sociocultural determinants of thought, ethics. *Prerequisites: restricted to seniors and graduate students in anthropology, linguistics, philosophy, political science, psychology, and sociology; consent of instructor.*

### **166. History of Psychology (4)**

Survey of the major trends and personalities in the development of psychological thought. Emphasis will be given to such selected topics as the mind-body problem, nativism vs. empiricism, and the genesis of behaviorism. *Prerequisites: three previous upper-division courses in psychology.*

### **167. Social and Emotional Development (4)**

Lecture course focused on the early social development of the child. Will include topics like attachment, moral development, sex roles, self definition, and peer interaction. *Prerequisites: Psych. 60 and 101.* (Not offered in 1992-93.)

### **168. Psychological Disorders of Childhood (4)**

This course explores different forms of psychological deviance in children, including severe psychopathology, neurosis, mental retardation, language disorders, and other behavior problems. Emphasis is placed on symptomatology, assessment, etiological factors, and various treatment modalities. *Prerequisite: upper-division standing.* (Not offered in 1992-93.)

### **172A-B. Current Issues in Brain and Behavior (4-4)**

For more than a century, debate has raged on the relation of physical (brain) events to mental life. This course will discuss current publications that relate to this debate. Although readings will span human and animal literature, emphasis will be on the more complex and cognitive aspects of human behavior. *Prerequisites: Psych. 106, or Psych. 189, or equivalent and consent of instructor.*

### **176. Functional Neuroanatomy (4)**

Introduction to the structure of the nervous system. The course will focus on the anatomy of the human brain and the function of different brain regions. The alteration of normal brain produced by injury or disease will also be discussed. *Prerequisite: upper-division standing.*

### **177. Introduction to Behavioral Genetics (4)**

Many factors contribute to determining how we think, feel, and act. This course will explore the role genetic factors play in de-

termining important individual characteristics like intelligence, personality and certain forms of abnormal behavior (e.g., alcoholism, criminality, and schizophrenia). The course will be taught primarily through lecture and selected readings. *Prerequisite: upper-division standing.*

### **179. Drugs, Addiction, and Mental Disorder (4)**

This course will consider the use, abuse, liability, and psychotherapeutic effects of drugs in humans. Lectures are supplemented by guest lectures from clinical experts in psychology and psychiatry. *Prerequisite: one lower-division psychology course (Psych. 1, 2, 3, or 4) or upper-division standing.*

### **181. Drugs and Behavior (4)**

Psychological effects, brain mode of action, patterns of use of psychoactive agents, including stimulants, sedative/hypnotics, hallucinogens, marijuana, alcohol, over-the-counter drugs, cognitive enhancers, anti-anxiety agents, antidepressants, and antipsychotics. This course develops basic principles in psychopharmacology while exploring the behavioral effects of drugs and mechanisms of action of drugs. *Prerequisite: junior standing.*

### **185. Communication: Nonverbal and Disfluent (4)**

This course will focus on nonverbal behaviors (gestures, facial expressions as well as pulse, skin conductance, and the like) and on speech disfluencies (ums, stutters, etc.) and what they can tell us about communication. *Prerequisite: upper-division standing.*

### **194A-B-C. Honors Thesis (4-4-4)**

Students will take part in a weekly research seminar. In addition, they will plan and carry out a three-quarter research project under the guidance of a faculty member. The project will form the basis of their senior honors thesis. *Prerequisites: one laboratory course in psychology (Psych. 115 through 128), Psych. 111, a 3.0 grade-point average, and consent of instructor.*

### **195. Instruction in Psychology (4)**

Introduction to teaching of introductory psychology. Each student will be responsible for and teach a class section in one of the lower-division psychology courses. (P/NP grades only.) Limited to seniors majoring in psychology with consent of instructor. Students will attend the lectures of the lower-division course, meet once a week with a class section and for one hour a week with the instructor. *Prerequisites: junior standing and either a) an A in the course in which the student plans to assist, or b) a grade-point average of B or better in no fewer than three upper-division psychology courses. Consent of instructor. Only counts once towards minor or major.*

### **198. Directed Group Study in Psychology (2)**

Group study under the direction of a faculty member in the Department of Psychology. *Prerequisites: Psych. 101, 102, 103, or 105.*

### **199. Independent Study (2-4)**

Independent study or research under direction of a member of the staff. Not counted for credit towards the major. (P/NP grades only.) *Prerequisite: special permission of department.*

## GRADUATE

### **201A-B. Quantitative Methods in Psychology (3-3)**

An intensive course in statistical methods and the mathematical treatment of data, with special reference to research in psychology. *Prerequisite: restricted to graduate students in psychology.*

### **202. Sensory Mechanisms (4)**

A survey of current problems in the analysis of sensory systems. (Not offered in 1992-93.)

### **203. Physiological Psychology (3)**

The central nervous system and its relation to behavior.

**204. Social Psychology (3)**

The behavior of man as a function of social variables. (Not offered in 1992-93.)

**205. Cognitive Engineering (3)**

Applied information processing psychology, emphasizing human-machine interaction. Development of formal principles of design based upon cognitive science. Topics include: principles of human-machine interaction, human and system-induced error, "friendly" systems, mental models and system images, moral implications, including the question of what tasks ought not be fully automated. (Not offered in 1992-93.)

**207. Principles of Behavior (3)**

Basic seminar on behavior theory with emphasis on principles of conditioning as the foundation of a general model of behavior. (Not offered in 1992-93.)

**209A. Judgment and Decision Making (3)**

General theory of judgment and decision making. Psychophysical judgment, social judgment, decision making, and rudiments of measurement theory. Primary emphasis on experimental applications. *Prerequisite: open to undergraduates with consent of instructor.* (Not offered in 1992-93.)

**209B. Judgment and Decision Making (3)**

General theory of judgment and decision. Primary emphasis on mathematical and statistical analysis of algebraic models, both for controlled experiments, and for observational field data. *Prerequisite: Psych. 209A.* (Not offered in 1992-93.)

**210. Motivation and Learning (3)**

Basic seminar on principles of human and animal motivation and learning. (Not offered in 1992-93.)

**211. Piagetian Theory (3)**

Selected topics in Piaget's theory of cognitive development. (Not offered in 1992-93.)

**212A-B-C. Introduction to Visual Science I, II, & III (3-3-3)**

Specification and measurement of the visual stimulus; introductions to basic physiological optics and visual neurophysiology. *Prerequisites: 212A; open to undergraduates with Psych. 159, 212B; open to undergraduates with Psych. 212A. 212C open to undergraduates with 212A and 212B.*

**213. Systematic Issues in Psychology (4)**

Selected historical and current topics will be discussed from competing theoretical perspectives. (Not offered in 1992-93.)

**215. Language Acquisition (4)**

Discussion of the acquisition of language by young children, including such topics as its stages, mechanisms, and relation to non-linguistic development. *Prerequisite: consent of instructor.*

**216. Basic Seminar in Comparative Cognitive Research (3)**

This seminar will review current research and theory in cognitive psychology, in order to characterize group differences in cognitive functioning. Groups chosen are assumed to be not equivalent in theoretically important ways that affect their performance on standard laboratory tasks.

**217. Proseminar in Cognitive Development (3)**

The course examines cognitive development through the school-age period. It begins with an examination of early neurological, sensory, motor and perceptual functions, and then focuses on issues in linguistic and cognitive development.

**218A-B. Cognitive Psychology (3-3)**

A two-quarter survey of basic principles and concepts of cognitive psychology. This course is intended to serve as the basic introduction for first-year students. Basic areas include knowledge, memory, thought, perception, and performance. The areas are taught by those faculty members who work within the spe-

cially. *Prerequisite: graduate status in psychology or consent of instructor.*

**219. Proseminar in Learning and Motivation (3)**

An overview of the experimental and applied analysis of behavior including topics such as the principles of operant and classical conditioning, stimulus control, choice, conditioned reinforcement, aversive control, biological and economic contexts, verbal behavior, and the modification of human behavior in a variety of applied settings.

**220. Proseminar in Social Psychology (3)**

An introduction to social psychology. Psychology and the law, health psychology, attitudes, emotions, person perception and aggression are some of the topics to be covered.

**221A. Sensory and Physiological Psychology I (3)**

Fundamentals of vision, audition, and other senses. Emphasis will be upon psychophysical approaches to the study of these sensory modalities, as well as some essential aspects of their neurophysiological bases.

**221B. Sensory and Physiological Psychology II (3)**

Physiological mechanisms underlying vision, hunger and thirst, and the physiological bases of memory and learning.

**222. Brain Functions (2)**

Selected topics. Advanced seminar. (Not offered in 1992-93.)

**223. Advanced Topics in Vision (4)**

An in-depth analysis of empirical and theoretical issues in a specialized area of vision or visual perception. Emphasis most likely will be on a topic of ongoing vision research at UCSD. *Prerequisite: Psych. 212A or special consent of instructor.*

**224. Experimental Analysis (3)**

Graduate course aimed at practical problems of experimental analysis and substantive interpretation of data. (Not offered in 1992-93.)

**225. The Development of Speech Perception (3)**

This seminar will deal with selected topics concerning how infants, young children, and adults analyze speech and how speech perception changes with development. (Not offered in 1992-93.)

**227. Cognitive Development (4)**

Selected topics with emphasis on current experimental work. *Prerequisite: consent of instructor.* (Not offered in 1992-93.)

**230. Brain, Cognition, and Development (3)**

This course focuses on issues related to early brain and cognitive development, with emphasis on early plasticity and lateralization of function. The course is designed for students in cognitive development with interest in cross-disciplinary issues.

**231. Advanced Topics in Human Information Processing (2)**

Selected discussions of advanced topics. *Prerequisite: Psych. 205 or consent of instructor.* (Not offered in 1992-93.)

**232. Advanced Topics in Human Social Behavior (3)**

The course will cover topics in human social behavior, with special emphasis on recent developments in experimental and social psychology. Such topics as aggression, affiliation, and the relationship between self-reports and other behavior will be examined. *Prerequisite: consent of instructor.* (Not offered in 1992-93.)

**233A-B. Topics in Learning and Motivation (3-3)**

Advanced topics in learning and motivation, with special emphasis on current research. *Prerequisite: Psych. 210.*

**234. Animal and Human Memory (3)**

This course traces the history of research into animal and human short-term memory. Classic models, current viewpoints, and their attendant epistemological presuppositions will be considered. The relationship between empirical analyses of memory in animals and humans will also be reviewed.

**235. Cognitive Psychophysiology (3)**

This seminar will survey the literature on psychophysiological studies of cognitive processes. The emphasis will be on work using event-related brain potentials to study psychological processes underlying perception, thought, or action. *Prerequisite: consent of instructor.* (Not offered in 1992-93.)

**236. Neural Plasticity and Regeneration (3)**

This seminar will cover topics related to neural plasticity in the mammalian nervous system. Current research on the structural changes that mediate functional recovery from injury will be emphasized.

**237. Modern Research in Visual Perception (3)**

This seminar will cover topics related to visual perception. Current research on vision, sensation, and perception will be discussed.

**238. Seminar on Visual Information Processing (3)**

The course will focus on experimental studies of higher level visual processing, emphasizing research on visual memory systems and on the functional locus of attentional selectivity in vision. Current work on picture and scene perception will be reviewed. The relationship between visual processes and spatial representation will also be reviewed. (Not offered in 1992-93.)

**239. Self-Deception: Theories and Evidence (3)**

This seminar will cover recent analyses of the problem of self-deception from various approaches, including the following: experimental cognitive and social-psychological studies, philosophical analyses of self-deception, and analyses of self-deception from the viewpoint of decision theory, evolutionary theory, and sociobiology. (Not offered in 1992-93.)

**240. Seminar on Human Memory (3)**

The seminar will deal with current theory and experimental research on basic processes in human memory. (Not offered in 1992-93.)

**241A-B-C. Advanced Topics in Cognition (4-4-4)**

Research and discussion on selected topics in cognitive psychology. May be taken by undergraduate senior majors concurrently enrolled in Psychology 194. (S/U grades permitted.) (Not offered in 1992-93.)

**242A-B-C. Research Topics in Developmental Psychology (4-4-4)**

Advanced seminar concentrating on methods of research and current experimental literature. May be taken by undergraduate senior majors concurrently enrolled in Psychology 194. *Prerequisite: consent of instructor.* (S/U grades permitted.)

**244. Special Topics in Psycholinguistics (4)**

Discussion of the psychological reality of grammatical models, competence versus performance, learnability and innateness in theories of language acquisition, and questions of autonomy of "modularity" of grammatical versus semantic processing. Studies of lexical accessing, sentence comprehension, sentence production, and acquisition will all be considered, as well as some recent work in aphasia. (Not offered in 1992-93.)

**245. Advanced Topics in Psycholinguistics (3)**

Research and discussion on selected topics in psycholinguistics. *Prerequisite: consent of instructor.* (Not offered in 1992-93.)

**246. Learning Theory (3)**

Material will include modern developments in learning theory, based primarily on research with animal subjects. *Prerequisite: consent of instructor.*

**247. The Psychology of Movement and Action (3)**

This seminar will survey literature on the cognitive processes underlying movement and action. Although the focus will be on psychology, some relevant literature from philosophy and neu-

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rosience will also be discussed. *Prerequisite: graduate standing or consent of instructor.*

### 248. Psychology and the Law (3)

This seminar surveys topics in psychology and the law. Emphasis will be on both applied and basic issues.

### 249A-B-C. Advanced Topics in Applied Behavior Analysis (3-3-3)

Research and discussion on selected topics in applied behavior analysis.

### 250. Selected Topics in Psychopathology (3)

Discussion of research on the major forms of psychopathology (e.g., schizophrenia, affective disorders, personality disorders). Topics will change yearly. The major emphases will be (1) understanding theories of etiology and symptom manifestation; and (2) evaluating research which bears on those theories. *Prerequisite: consent of instructor.*

### 251. Advanced Topics in Learning and Motivation (3)

Weekly meetings for graduate students actively engaged in research on conditioning. *Prerequisite: consent of instructor.*

### 252. Seminar on Cognitive Neuroscience (3)

This is a series of weekly seminars on current trends in neuropsychology. The seminars will deal with the concept of "localization" of function in different parts of the brain and the effects of damage to these parts on cognitive functions such as perception, memory and language. Active student participation will be encouraged in preparing these seminars. (Not offered in 1992-93.)

### 253. Advanced Topics in Cognitive Decision Theory (3)

Research and discussion on selected topics in cognitive psychology. *Prerequisite: consent of instructor.*

### 254. Advanced Topics in Perception (3)

Research and discussion on selected topics in perception. *Prerequisite: consent of instructor.* (Not offered in 1992-93.)

### 255. Advanced Topics in Physiological Psychology (3)

Research and discussion on selected topics in physiological psychology. *Prerequisites: consent of instructor. Open to undergraduates with consent of instructor.*

### 259A-B-C. Advanced Seminar in Comparative Cognitive Research (3-3-3)

Advanced topics in comparative, cognitive research. (Not offered in 1992-93.)

### 260. Advanced Topics (2)

Advanced seminar on special topics in theoretical and experimental psychology. *Prerequisite: graduate student in psychology.* (Not offered in 1992-93.)

### 261. Topics in the History of Psychology (3)

The seminar will cover the development of concepts and methods in psychology, particularly during the nineteenth and twentieth centuries. Particular emphasis will be placed on the precursors of currently active areas of research and theory and on the historical and social contexts for these developments. *Prerequisites: completion of first year of graduate work in psychology or consent of instructor.* (Not offered in 1992-93.)

### 262. Emotion: Theories and Evidence (3)

A critical examination of current theories of human emotion from the point of view of contemporary cognitive psychology. Discussion of behavior and physiological research in the light of different theoretical positions. *Prerequisite: second-year graduate standing in psychology or consent of instructor.*

### 263. Psychopharmacology (3)

This course will explore the basic neuropharmacological mechanism of action of the major classes of drugs, including neuroleptics, stimulants, anti-depressants, minor and major tranquilizers, and sedative hypnotics. It will focus on the use of behavioral techniques for evaluating the neural mechanisms by which these drugs act.

### 264. Special Topics in Social Cognition (3)

Seminar on current theory and research on social perception, memory for social events and people, and attribution theory. Open to graduates and advanced undergraduates. *Prerequisite: open to undergraduates with Psych. 147 or by consent of instructor.* (Not offered in 1992-93.)

### 265. Psychology and Medicine (3)

Concentrates on what psychology has to contribute to the understanding of illness, its treatment, and the social context in which these processes occur. Topics: Psychological factors in the etiology and treatment of illness, doctor-patient roles, and communication. *Prerequisites: open to undergraduates with Psych. 126 or Psych. 127 and consent of instructor.*

### 267A-B-C. Advanced Topics in Social Cognition (3-3-3)

Research and discussion on selected topics in social cognition.

### 268A-B-C. Advanced Topics in Experimental Psychopathology (3-3-3)

Research and discussion on selected topics in experimental psychopathology.

### 270A-B-C. Introduction to Laboratory Experimentation (1-4)

A basic laboratory course, designed to introduce first-year graduate students to experimental methods in psychology. The student will select a research topic, do a thorough literature review of the area, design and carry out new, original studies of problems in the selected area, and prepare a final formal report of the study at the end of the spring quarter. This course is required of all first-year graduate students in the department. *Prerequisite: first-year psychology graduate students only.*

### 280. Seminar in Communication and Information Processing (1)

(S/U grades only.)

### 281A-B-C. Topics in Human Information Processing (1-1-1)

Weekly seminar on advanced topics in the contemporary literature on information processing. *Prerequisite: Psych. 270C.* (Not offered in 1992-93.)

### 296. Research Practicum (1-12)

Research in psychology under supervision of individual staff members. (S/U grades permitted.) (F,W,S)

### 298. Library Research (1-12)

Reports and surveys of the literature on selected topics. *Prerequisite: graduate students in psychology.* (S/U grades permitted.) (F,W,S)

### 299. Independent Research (1-12)

Independent research and thesis research. (S/U grades permitted.) (F,W,S)

### 500. Apprentice Teaching (4)

Required teaching practicum for students enrolled in graduate program in psychology. One four-unit course per year for four years. (S/U grades only.)

Stephen Cox, *Literature*

Page A. duBois, *Literature*

William C. Fitzgerald, *Literature*

David Noel Freedman, *History*

Richard E. Friedman, *Literature*

Ali Gheissari, *Sociology*

David Goodblatt, *History*

Ramon A. Gutierrez, *History, Ethnic Studies*

Alan C. Houston, *Political Science*

Fanny Q. Howe, *Literature*

S. Nicholas Jolley, *Philosophy*

David K. Jordan, *Anthropology*

Bennetta W. Jules-Rosette, *Sociology*

Hasan Kayali, *History*

Sanford A. Lakoff, *Political Science*

Edward N. Lee, *Philosophy*

Tanya M. Luhrmann, *Anthropology*

James K. Lyon, *Literature*

Richard P. Madsen, *Sociology*

John A. Marino, *History*

Michael E. Meeker, *Anthropology*

Alden A. Mosshammer, *History*

Sheldon A. Nodelman, *Visual Arts*

Fitz John P. Poole, *Anthropology*

William H. Propp, *History*

Fred V. Randel, *Literature*

Edward Reynolds, *History*

Theodore Schwartz, *Anthropology*

Gershon Shafir, *Sociology*

Melford E. Spiro, *Anthropology*

Tracy B. Strong, *Political Science*

Christena Turner, *Sociology*

Donald F. Tuzin, *Anthropology*

Wai-Lim Yip, *Literature*

The Program in Religious Studies provides students with broad training in three areas: major religious traditions, diverse disciplinary approaches to the study of religion, and an understanding of the issues and problems that religions seek to solve. At UCSD, faculty from the Departments of Anthropology, History, Literature, Philosophy, Political Science, Sociology, and Visual Arts provide students with the opportunity to pursue a concentration in either the field of religions of Southwest Asia, Mediterranean and European origin religions or the comparative field of religion and culture. Students are able to examine the texts, symbols, myths, rituals, ideas, values, ethical systems, and institutions of religious traditions in a cultural and historical context.

A concentration in religious studies aims at increasing a student's understanding of the human experience through history and cultures. The goal is not to fashion "experts" in religion, but rather, like any good liberal art, to use the discipline as a way of developing critical

## RELIGIOUS STUDIES

Office: 4005 Humanities and Social Sciences Building, Muir College, 534-8849

### Faculty

Henry E. Allison, *Philosophy*

Stanley A. Chodorow, *History*

Alain J. J. Cohen, *Literature*

thinking and of probing into the broadest questions of meaning and value.

## LOWER-DIVISION PREPARATION

Since the Program in Religious Studies is an interdisciplinary and comparative approach to the study of religious traditions, lower-division preparation can be wide and varied. Exposure to one or more great religious traditions, the study of ideas and methods of analysis, and courses that focus on textual and contextual analysis would all be good introductions to some of the problems of religions in culture. Recommended courses include: ANLD 22-23-24; HILD 2A-B-C; HILD 3A-B-C; HILD 4A-B-C; LTGN 19A-B-C; LTEN 21-22-23; Phil. 31-32-33; Soc. 1A-B and ANLD 22; Fifth College Making of the Modern World; Revelle College Humanities; and Cultural Traditions 1A-B-C.

The Program in Religious Studies strongly encourages foreign language study. Many upper-division courses in various religious traditions are text based, and ability to read the languages in the original sources is highly recommended.

## MAJOR

Major programs in religious studies should include the following upper-division courses:

1. Three-quarter sequence in Religious Traditions (RELI 100, 101, 102).
2. One quarter of methodology (ANGN 141, ANGN 147, Phil. 160, or Soc. 156).
3. Six quarters in the field of religious traditions of Southwest Asia, Mediterranean and European origin.
4. Two quarters in either the field of religious traditions of South and East Asia origin or the general comparative/methodological field.

The courses listed under "Topics" and/or "Context" headings can be taken for religious studies credit after consultation with and approval from the religious studies adviser and the course instructor.

A typical twelve-course major program with a focus on early religions would include the three-quarter Religious Traditions sequence (RELI 100, 101, 102); one quarter of methodology (Phil. 160); six quarters in the field of religious traditions of Southwest Asia, Mediterranean and European origin (HINE 104, HINE 160, Phil. 103, Soc. 188H, Vis. Arts 120C and HINE 108); and two quarters in the general comparative/methodological field (Phil. 108 and Vis. Arts 121A).

With the addition of new faculty members specializing in South and East Asian religions, the Program in Religious Studies eventually

plans to provide for the option of a concentration in religious traditions of South and East Asia origin (six quarters in the field of religious traditions of South and East Asia origin and two quarters in either the field of religious traditions of Southwest Asia, Mediterranean and European origin or the general comparative/methodological field).

## MINOR

The minor in religious studies consists of six upper-division courses. The three-quarter sequence in Religious Traditions (RELI 100, 101, 102) is required of all minors. Three other upper-division courses selected from the approved offerings complete the minor.

A typical six-course minor would include the three-course requirement (RELI 100, 101, 102); one course in the general comparative/methodology field; and two courses in a specific religious tradition (either Southwest Asia, Mediterranean and European or South and East Asia origin).

## REQUIRED COURSES

### RELI 100. Religious Traditions: Ancient Near Eastern Religions (4)

A comprehensive study of the ancient religious traditions of the world. The course will cover tribal religions, classical polytheism, and the religion of the ancient Hebrews. This course is required for all religious studies majors and minors. *Prerequisite: upper-division standing.* (This course is cross-listed as HITO 100.)

### RELI 101. Religious Traditions: Judaism, Christianity, Islam (4)

A comprehensive study of the Western religious traditions. The course will cover Judaism, Christianity, and Islam. This course is required for all religious studies majors and minors. *Prerequisite: upper-division standing.* (This course is cross-listed as HITO 101.)

### RELI 102. Religious Traditions: South and East Asian Religious Traditions (4)

A comprehensive study of the Asian religious traditions. The course will cover Hinduism, Buddhism, Taoism, Shinto, and Confucian thought. This course is required for all religious studies majors and minors. *Prerequisite: upper-division standing.* (This course is cross-listed as HITO 102.)

**One methodological course** from those below marked with an asterisk is required of all majors.

## APPROVED ELECTIVE COURSES

For descriptions of the courses listed below, please refer to the appropriate department's section of this catalog.

### General Comparative/Methodological

ANGN 139. Religious Cults and Social Movements

\*ANGN 141. Religion and Society

\*ANGN 147. Ritual and Symbolism

ANGN 165. Approaching the Sacred

ANGN 193. Witchcraft, Shamanism, and Psychiatry

Phil. 108. Mythology and Philosophy

\*Phil. 160. Philosophy of Religion

\*Soc. 156. Sociology of Religion

Soc. 157. Religion in Contemporary Society

Vis. Arts 121A. Prehistoric Art

Vis. Arts 127B. Western and Non-Western Rituals and Ceremonies

### Religious Traditions of Southwest Asia, Mediterranean and European Origin

HIEU 105. The Early Christian Church

HIEU 125. Reformation Europe

HIEU 145. European Jewry: 1750-1880

HIEU 162. Special Topics in the History of Early Christianity

HINE 100. The Ancient Near East and Israel

HINE 101. Hebrew Prophetic Literature

HINE 102. The Jews in Their Homeland in Antiquity

HINE 103. The Jewish Diaspora in Antiquity

HINE 104. The Bible and the Ancient Near East

HINE 160. Special Topics in the Bible and Ancient Near East

HISC 162. Problems in the History of Science and Religion

LTEN 118. Milton

LTEN 147. Metamorphoses of the Symbol

LTGN 148. The Bible and Western Literature

LTGN 150. Jewish Mysticism

LTGN 151. The Bible: The Prophetic Books

LTGN 152. The Bible: The Narrative Books

LTGN 153. The Bible: The Poetic Books

LTGN 154. Medieval Hebrew Literature

LTGN 156. Topics in the Prophets

LTGN 157. Topics in Biblical Narrative

LTGN 158. Topics in Biblical Poetry

LTGK 120. New Testament Greek

Phil. 103. Medieval Philosophy

Phil. 104. The Rationalists

Phil. 161. Religious Existentialism

Soc. 158. Islam in the Modern World

Soc. 188F. Modern Jewish Societies and Israeli Society

Soc. 188H. Middle Eastern Societies

Vis. Arts 120C. Late Antique Art

### Religious Traditions of South and East Asia Origin

ANRG 152. Gandhi: The Man and His Society

ANRG 173. Chinese Popular Religion

Soc. 158J. Religion and Ethics in China and Japan

## TOPICS COURSES\*

### General Comparative/Methodological

LTGN 181. Mythology

LTGN 185. Literature and Ideas

Soc. 159. Special Topics in the Sociology of Organizations and Institutions

### Religious Traditions of Southwest Asia, Mediterranean and European Origin

HINE 166. Nationalism in the Middle East

HINE 170. Special Topics in Jewish History

LTGN 120. Yiddish Literature in Translation



## RUSSIAN AND SOVIET STUDIES PROGRAM

LTGN 149. The Jewish Experience in Literature  
 LTGN 155. Hebrew Literature: The Modern Period

### **Religious Traditions of South and East Asia Origin**

HIEA 160. Colloquium on Modern Japanese History  
 HIEA 167. Special Topics in Modern Chinese History

### **CONTEXT COURSES\***

#### **Religious Traditions of Southwest Asia, Mediterranean and European Origin**

HINE 108. The Middle East Before Islam  
 HINE 114. History of the Islamic Middle East  
 Poli. Sci. 110A. Systems of Political Thought: Western, Ancient, Medieval  
 Poli. Sci. 110B. Systems of Political Thought: Machiavelli to French Revolution  
 Poli. Sci. 110C. Systems of Political Thought: The Nineteenth Century  
 Poli. Sci. 120A. Political Development of Western Europe  
 Vis. Arts 122A. Art of the Middle Ages  
 Vis. Arts 122B. Renaissance Art  
 Vis. Arts 123A. Italian Art of the Early Renaissance  
 Vis. Arts 123B. High Renaissance Art  
 Vis. Arts 123C. Michelangelo  
 Vis. Arts 123F. Castles, Cathedrals, and Cities  
 Vis. Arts 123H. Images of Women in Medieval and Renaissance Art  
 Vis. Arts 123I. The Illuminated Manuscript in the Middle Ages.

#### **Religious Traditions of South and East Asia Origin**

HIEA 120. History of Chinese Thought and Society: Ancient Imperial Period  
 HIEA 121. History of Chinese Thought and Society: Middle Imperial Period  
 HIEA 122. History of Chinese Thought and Society: Late Imperial Period

\*Courses listed under these headings require special approval for religious studies credit.

For further course offerings and/or Topics or Context Course approvals, contact the Program in Religious Studies Office.

## **REVELLE COLLEGE**

OFFICE: Provost's Office Building, Revelle College

### **HUMANITIES/WRITING PROGRAM**

OFFICE: 1512 Galbraith Hall, Revelle College  
 See Humanities Program for Revelle writing.

## **REVELLE HONORS PROGRAM**

OFFICE: Office of the Provost, Revelle College

Particularly well-prepared students are invited to join a freshman honors program, which includes weekly participation in small faculty seminars (Revelle 20). Additional free computer time and a variety of other perquisites are also awarded. Outstanding students are individually advised to participate in small honors classes in chemistry, mathematics, and social science.

Outstanding seniors are selected for participation in an honors seminar, Revelle 100. At least five outstanding graduating seniors are honored at graduation each year with a monetary honorarium.

An honors banquet is given for the top one hundred students (from all class levels) in Revelle each spring.

#### **Revelle 20. Revelle Honors Seminar (0)**

Weekly seminars with a faculty member (chosen each year by the provost to match the interests of participating students). This seminar will acquaint students with the scholarship and research being conducted by faculty and instill in students a sense of participation in the scholarly life at UCSD. *Prerequisite: by invitation only. Pass/Not Pass grades only. (W)*

#### **Revelle 100. Senior Honors Seminar: Science and Civilization (4)**

Beginning with the distinction between science and technology, the course will trace their evolution from earliest times, culminating in an examination of their impact on modern society and of the social concerns about their future course. *Prerequisites: senior standing, 3.5 overall GPA, science major, consent of instructor, Revelle students only. Pass/Not Pass grades only. (S)*

## **REVELLE SEMINARS**

OFFICE: Office of the Provost, Revelle College

Revelle Seminars 90 (1.0 unit credit) are sponsored by Revelle College to promote student/faculty interaction in a small group setting.

#### **Revelle 90. Undergraduate Seminar (1)**

A seminar intended for exposing undergraduate students, especially freshmen and sophomores, to exciting research programs conducted by the faculty. *Prerequisites: none. Pass/Not Pass grades only. (F,W,S)*

## **RUSSIAN AND SOVIET STUDIES PROGRAM**

OFFICE: 7039 Humanities and Social Sciences Building, Muir College

#### **Faculty**

Steven Cassedy, Ph.D., *Professor in Literature*  
 Frantisek Deak, Ph.D., *Associate Professor in Theatre*

Robert Edelman, Ph.D., *Associate Professor in History*  
 Beth Holmgren, Ph.D., *Assistant Professor in Literature*  
 Timothy McDaniel, Ph.D., *Professor in Sociology*  
 Philip Roeder, Ph.D., *Assistant Professor in Political Science*  
 Rebecca Wells, *Lecturer in Literature*

## **THE MINOR**

Russian and Soviet studies is an interdisciplinary minor that provides a broad range of courses in the history, language, literature, and social and political life of Russia (both pre- and post-revolutionary) and the present-day Soviet Union. The minor consists of six courses, at least three of which must be upper-division. In addition, there must be at least one course from two of the three general areas of literature, history, and social science, and no more than three of the six courses can be in the language. Knowledge of the language is not a requirement for the minor, but is of course strongly recommended. A minor in Russian and Soviet studies will give a general background in this vitally important area of the world to interested students and will also provide a foundation for graduate studies in the related fields.

## **Courses**

### **LITERATURE**

LTRU 1A-B-C First-year Russian (4-4-4)  
 LTRU 2A-B-C Second-year Russian (4-4-4)  
 LTRU 101A-B-C Advanced Russian (4-4-4)  
 LTRU 110A-B-C Survey of Russian and Soviet Literature in Translation (4-4-4)  
 110A 1800-1860  
 110B 1860-1917  
 110C 1917-present  
 LTRU 123 Single Author in Russian Literature (4)  
 LTRU 128 Single Author in Soviet Literature (4)  
 LTRU 129 Twentieth-Century Russian or Soviet Literature in Translation (4)  
 LTRU 130 Genres in Russian Literature (4)  
 LTRU 131 Russian Short Fiction (4)  
 LTRU 132 Russian Poetry (4)  
 LTRU 133 Russian and Soviet Drama (4)  
 LTRU 198 Directed Group Study (4)  
 LTRU 199 Special Studies (2 or 4)

### **THEATRE**

Theatre 168 History of the Russian Theatre (4)



■ **HISTORY**

- HIEU 134 AND 156 Russian History (4-4)
- HIEU 157 Early Soviet Social History (4)
- HIEU 178 Special Topics in Modern Russian History (4)

▼ **SCIENCE STUDIES**

OFFICE: 3045 Humanities and Social Sciences Building, Muir College

**Professors**

- Paul M. Churchland, Ph.D., *Philosophy*
- Gerald D. Doppelt, Ph.D., *Philosophy*
- Philip S. Kitcher, Ph.D., *Philosophy*
- Bruno Latour, Ph.D., *Sociology; also Centre de l'Innovation, Paris*
- Chandra Mukerji, Ph.D., *Sociology and Communication*
- Martin J. S. Rudwick, Ph.D., *History*
- Andrew Scull, Ph.D., *Sociology*
- Steven Shapin, Ph.D., *Sociology*
- Robert S. Westman, Ph.D., *History*

**Associate Professor**

Robert Marc Friedman, Ph.D., *History*

**Assistant Professor**

Sandra D. Mitchell, Ph.D., *Philosophy*

The Science Studies Program at UCSD is a Ph.D. program committed to developing an interdisciplinary approach to understanding, interpreting, and explaining the scientific enterprise, drawing upon and integrating the perspectives developed in the history, sociology, and philosophy of science. The program offers students an opportunity to work toward such integration, while receiving a thorough training at a professional level in one of the component disciplines. Students enrolled in the program choose one of the three disciplines for their major field of specialist studies and are required to complete minor field requirements in the other two. The core of the program, however, is a year-long Seminar in Science Studies, led by faculty from all three participating departments. Science studies students are encouraged to select dissertation topics that offer scope for a cross-disciplinary approach. The Ph.D. will be awarded in "History (Science Studies)," "Sociology (Science Studies)," or "Philosophy (Science Studies)." In special circumstances, students may be permitted to work for the M.A. degree.

**Courses**

**GRADUATE**

**HIGR 235A-B-C, Philosophy 209A-B-C, Sociology 255A-B-C. Seminar in Science Studies (4-4-4)**

A three-quarter sequence of readings and discussion, taught each quarter by a member of one of the departments (history, sociology, philosophy) participating in the graduate Science Studies Program. Required for all students in the program in their first year; those in later years are expected to audit this course, the content of which will change from year to year. (IP grade to be awarded the first and second quarters; final grade will not be given until the end of the third quarter.) *Prerequisite: graduate standing.*

**HIGR 236A-B. Seminar in History of Science (4-4)**

A two-quarter research seminar, comprising intensive study of a specific topic in the history of science. The first quarter will be devoted to readings and discussions; the second chiefly to the writing of individual research papers. The topic varies from year to year, and students may therefore repeat the course for credit. (IP grade to be awarded the first quarter; final grade will be given at the end of the second quarter.) *Prerequisite: graduate standing.*

**HIGR 237. Topics in the History of Earth, Ocean, and Atmospheric Sciences (4)**

Intensive study of specific problems in the history of the ocean sciences and of related earth and atmospheric sciences in the modern period. Topics vary from year to year, and students may therefore repeat the course for credit.

**Soc. 225. Madness and Society (4)**

An examination of the historical and sociological literatures on the relationship between madness and society, focusing primarily on the United States and Great Britain but with some comparative reference to western Europe.

**Soc. 236. Contemporary Topics in the Sociology of Science (4)**

This seminar will cover current books and theoretical issues in the sociology of science. Topics will vary from year to year. May be repeated three times for credit.

**Soc. 237. Historical Sociology of Science (4)**

In recent years the sociology of science and the history of science have developed increasingly close links and shared projects. Those include the detailed naturalistic study of actual scientific practice, the analysis of the social construction of scientific knowledge in particular social settings, and the examination of relationships between the moral economy of scientific sites and the status of the knowledge produced there. Particular attention will be paid to the identity of peculiarly historical and sociological perspectives. Technical problems concerning the deployment of sociological frameworks in historical study will be addressed. Students will read and assess a range of recent work in which the connection between sociology and history of science is most evident.

**Soc. 238. Relativism and the Sociology of Science (4)**

A critical survey of theoretical and empirical sociological work advocating a relativist perspective on scientific knowledge. Special attention is paid to the characterization of different relativist genres, to the debates between relativism, realism and rationalism, and to the empirical grounding of relativism in studies of scientific controversy and closure.

**Soc. 277. The Sociology of Technology (4)**

Social theory has been largely uninterested in technology. The major exceptions are to be found in the evolutionary stories concerning "man the tool maker." The aim of the seminar is to review the literature in paleontology, philosophy of technology,

and technology on the link between tools and social theory. The idea of the seminar is to test ideas coming from sociology of technology, ethology, and evolutionary scenarios, and anthropology of tool use, in order to make room in social theory for artifacts.

**Phil. 212. Contemporary Topics in the Philosophy of Science (4)**

This seminar will cover current books and theoretical issues in the philosophy of science. Topics will vary from year to year. *Prerequisite: Philosophy 180, or equivalent, or consent of instructor.*

▼ **SCIENCE, TECHNOLOGY, AND PUBLIC AFFAIRS**

OFFICE: 1512 Galbraith Hall, Revelle College

The program offers an opportunity to study the important social policy issues that lie at the intersection of science, technology, and decision making and to develop awareness of the social and political factors that condition technology on the social order. The program will be attractive to students anticipating careers in law, administrative sciences, science, engineering, business, and international affairs. The program will serve as a meeting place for those interested in approaching policy questions from the perspective of the physical and biological sciences and for those in the social sciences having an interest in the scientific and technological component of present social, political, and environment problems.

**Courses**

**UPPER-DIVISION**

**181. Elements of International Medicine (4)**

The sociocultural, economic, and geopolitical framework for the study and understanding of medical problems on a worldwide scale, and as basis for international health policy. Global patterns of disease, availability and needs for medical technology, and comparisons between diverse medical education and health care delivery systems abroad with those in the U.S. Students should be able to acquire an understanding of diverse determinants of disease, and of relationships between socioeconomic development and health. *Prerequisite: senior or graduate standing.* H. Simon

**199. Special Project (2 or 4)**

Directed study on topics in science, technology and public affairs; especially for Warren College students. (P/NP grades only.) *Prerequisite: senior standing.*

**RELATED COURSES**

Courses in other departments (change somewhat from year to year):

AMES 35, 119A, 119B, 119C  
 Communication/SF 128  
 CSE 69  
 Economics 130  
 Philosophy 186  
 Political Science 160AA  
 Political Science 160AB  
 Political Science 161  
 Political Science 162AC  
 Political Science 166B  
 Political Science 166D  
 Political Science 167  
 Sociology 116  
 Sociology 168

**SCRIPPS INSTITUTION OF OCEANOGRAPHY**

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OFFICE: 22 Old Scripps Bldg., Scripps Institution of Oceanography

**Professors**

Duncan C. Agnew, Ph.D., *Geophysics*  
 Laurence Armi, Ph.D., *Oceanography*  
 Gustaf Arrhenius, Ph.D., *Oceanography*  
 George E. Backus, Ph.D., *Geophysics*  
 Jeffrey L. Bada, Ph.D., *Marine Chemistry*  
 Wolfgang H. Berger, Ph.D., *Oceanography*  
 Michael J. Buckingham, Ph.D., *Oceanography*  
 Steven C. Cande, Ph.D., *Marine Geophysics*  
 Harmon Craig, Ph.D., *Geochemistry and Oceanography*  
 Russ E. Davis, Ph.D., *Oceanography*  
 Paul K. Dayton, Ph.D., *Oceanography*  
 LeRoy M. Dorman, Ph.D., *Geophysics*  
 James T. Enright, Ph.D., *Behavioral Physiology*  
 D. John Faulkner, Ph.D., *Marine Chemistry*  
 Edward A. Frieman, Ph.D., *Physics, Vice Chancellor of Marine Sciences and Director of Scripps Institution of Oceanography*  
 Carl H. Gibson, Ph.D., *Engineering Physics and Oceanography*  
 Joris M. T. M. Gieskes, Ph.D., *Oceanography*  
 J. Freeman Gilbert, Ph.D., *Geophysics*  
 Edward D. Goldberg, Ph.D., *Chemistry*  
 Robert T. Guza, Ph.D., *Oceanography*  
 James W. Hawkins, Ph.D., *Geology*  
 Walter F. Heiligenberg, Ph.D., *Behavioral Physiology*  
 Myrl C. Hendershott, Ph.D., *Oceanography*  
 Robert R. Hessler, Ph.D., *Biological Oceanography*  
 William S. Hodgkiss, Ph.D., *Electrical Engineering*  
 Nicholas D. Holland, Ph.D., *Marine Biology*  
 Miriam Kastner, Ph.D., *Geology*

Charles D. Keeling, Ph.D., *Oceanography*  
 Devendra Lal, Ph.D., *Nuclear Geophysics*  
 Peter F. Lonsdale, Ph.D., *Oceanography*  
 J. Douglas Macdougall, Ph.D., *Earth Sciences*  
 T. Guy Masters, Ph.D., *Geophysics*  
 John A. McGowan, Ph.D., *Oceanography*  
 W. Kendall Melville, Ph.D., *Oceanography*  
 Jean-Bernard H. Minster, Ph.D., *Geophysics*  
 Michael M. Mullin, Ph.D., *Oceanography*  
 William A. Newman, Ph.D., *Oceanography*  
 Pearn P. Niiler, Ph.D., *Oceanography*  
 John A. Orcutt, Ph.D., *Geophysics*  
 Robert L. Parker, Ph.D., *Geophysics*  
 Robert Pinkel, Ph.D., *Oceanography*  
 V. Ramanathan, Ph.D., *Geophysical Sciences*  
 Richard H. Rosenblatt, Ph.D., *Marine Biology, and Chair of the Department*  
 Richard L. Salmon, Ph.D., *Oceanography*  
 John G. Sclater, Ph.D., *Marine Geophysics*  
 Richard C. J. Somerville, Ph.D., *Meteorology*  
 Victor D. Vacquier, Ph.D., *Marine Biology*  
 Charles W. Van Atta, Ph.D., *Engineering Physics and Oceanography*  
 Martin Wahlen, Ph.D., *Geochemistry*  
 Ray F. Weiss, Ph.D., *Geochemistry*  
 Clinton D. Winant, Ph.D., *Oceanography*  
 Edward L. Winterer, Ph.D., *Geology*  
 William R. Young, Ph.D., *Oceanography*  
 Robert S. Arthur, Ph.D., *Oceanography, Emeritus*  
 Andrew A. Benson, Ph.D., *Biology, Emeritus*  
 Charles S. Cox, Ph.D., *Oceanography, Emeritus*  
 Joseph R. Curray, Ph.D., *Geology, Emeritus*  
 Seibert Q. Duntley, Sc.D., *Physics, Emeritus*  
 Albert E. J. Engel, Ph.D., *Geology, Emeritus*  
 Harold T. Hammel, Ph.D., *Physiology, Emeritus*  
 Richard A. Haubrich, Ph.D., *Geophysics, Emeritus*  
 Francis T. Haxo, Ph.D., *Biology, Emeritus*  
 Douglas L. Inman, Ph.D., *Oceanography, Emeritus*  
 Ralph A. Lewin, Ph.D., Sc.D., *Biology, Emeritus*  
 Walter H. Munk, Ph.D., *Oceanography, Emeritus*  
 William A. Nierenberg, Ph.D., *Geophysics, Director, Emeritus*  
 Melvin N. A. Peterson, Ph.D., *Oceanography, Emeritus*  
 Fred B. Phleger, Ph.D., *Oceanography, Emeritus*  
 Russell W. Raitt, Ph.D., *Geophysics, Emeritus*  
 Joseph L. Reid, M.S., *Oceanography, Emeritus*  
 George G. Shor, Jr., Ph.D., *Marine Geophysics, Emeritus*  
 Fred N. Spiess, Ph.D., *Oceanography, Emeritus*  
 Victor Vacquier, M.A., *Geophysics, Emeritus*  
 Benjamin E. Volcani, Ph.D., *Microbiology, Emeritus*  
 Kenneth M. Watson, Ph.D., *Physical Oceanography, Emeritus*

**Associate Professors**

David M. Checkley, Ph.D., *Oceanography*  
 Horst Felbeck, Dr. rer. nat., *Marine Biology*  
 John A. Hildebrand, Ph.D., *Geophysics*  
 Lisa A. Levin, Ph.D., *Oceanography*  
 Jason Phipps Morgan, Ph.D., *Geophysics*  
 Dean H. Roemmich, Ph.D., *Oceanography*  
 David T. Sandwell, Ph.D., *Geophysics*  
 Peter M. Shearer, Ph.D., *Geophysics*  
 George Sugihara, Ph.D., *Mathematical Ecology*  
 Lynne D. Talley, Ph.D., *Oceanography*  
 Lisa Tauxe, Ph.D., *Geophysics*

**Assistant Professors**

Douglas H. Bartlett, Ph.D., *Marine Microbiology*  
 Kevin M. Brown, Ph.D., *Geology*  
 Paterno R. Castillo, Ph.D., *Geology*  
 Christopher D. Charles, Ph.D., *Oceanography*  
 Catherine G. Constable, Ph.D., *Geophysics*  
 Margo G. Haygood, Ph.D., *Marine Biology*  
 Timothy D. Herbert, Ph.D., *Geology, and Vice Chair of the Department*  
 Mark D. Ohman, Ph.D., *Oceanography*  
 Robert E. Shadwick, Ph.D., *Marine Biology*  
 Arthur J. Spivack, Ph.D., *Geochemistry*  
 Wuchang Wei, Ph.D., *Oceanography*  
 Bradley T. Werner, Ph.D., *Oceanography*

**Professors-in-Residence**

Farooq Azam, Ph.D., *Biology*  
 William H. Fenical, Ph.D., *Chemistry*

**Adjunct Professors**

Yehuda Bock, Ph.D., *Geophysics*  
 Douglas P. DeMaster, Ph.D., *Oceanography*  
 Richard B. Deriso, Ph.D., *Biological Oceanography*  
 John R. Hunter, Ph.D., *Marine Biology*  
 Michael S. Longuet-Higgins, Ph.D., *Oceanography*  
 William F. Perrin, Ph.D., *Marine Biology*  
 Paul E. Smith, Ph.D., *Biological Oceanography*  
 George N. Somero, Ph.D., *Biology*  
 David J. Thomson, Ph.D., *Geophysics*

**Senior Lecturers**

Yaacov K. Bendor, Ph.D., *Research Geologist*  
 Jonathan Berger, Ph.D., *Research Geophysicist*  
 Angelo F. Carlucci, Ph.D., *Research Microbiologist*  
 Jeffrey B. Graham, Ph.D., *Research Biologist*  
 Edvard A. Hemmingsen, Ph.D., *Research Physiologist*  
 Osmund Holm-Hansen, Ph.D., *Research Biologist*  
 Robert A. Knox, Ph.D., *Research Oceanographer*  
 Gerald L. Kooyman, Ph.D., *Research Biologist*  
 James H. Natland, Ph.D., *Research Geologist*  
 Richard J. Seymour, Ph.D., *Research Engineer*  
 Kenneth L. Smith, Jr., Ph.D., *Research Biologist*  
 Elizabeth L. Venrick, Ph.D., *Research Biologist*  
 A. Aristides Yayanos, Ph.D., *Research Biologist*

**Lecturers**

- Steven C. Constable, Ph.D., *Associate Research Geophysicist*  
 Bruce D. Cornuelle, Ph.D., *Associate Research Oceanographer*  
 Andrew G. Dickson, Ph.D., *Associate Research Chemist*  
 Nicholas E. Graham, Ph.D., *Assistant Research Meteorologist*  
 Thomas L. Hayward, Ph.D., *Associate Research Oceanographer*  
 Mark E. Huntley, Ph.D., *Associate Research Biologist*  
 Scott A. Jenkins, Ph.D., *Assistant Research Engineer*  
 Clare E. Reimers, Ph.D., *Assistant Research Geochemist*  
 Hubert Staudigel, Ph.D., *Assistant Research Geologist*  
 Bradley M. Tebo, Ph.D., *Assistant Research Biologist*  
 Peter F. Worcester, Ph.D., *Associate Research Oceanographer*  
 Mark A. Zumberge, Ph.D., *Associate Research Geophysicist*

**Affiliated Faculty**

- Victor C. Anderson, Ph.D., *Professor, Emeritus, ECE*  
 Hassan Aref, Ph.D., *Professor, AMES*  
 James R. Arnold, Ph.D., *Professor, Chemistry*  
 Hugh Bradner, Ph.D., *Professor Emeritus, AMES*  
 Theodore H. Bullock, Ph.D., *Professor Emeritus, Neurosciences*  
 John W. Miles, Ph.D., *Professor Emeritus, AMES*

The graduate department of the Scripps Institution of Oceanography offers graduate instruction leading to M.S. and Ph.D. degrees in oceanography, in marine biology, and in earth sciences. Emphasis is on the Ph.D. program. A student's work normally will be concentrated in one of several curricular programs within the department. These programs include biological oceanography, marine biology, geochemistry and marine chemistry, geological sciences, geophysics, physical oceanography, and applied ocean sciences.

No undergraduate major is offered in the department though most courses in the department are open to enrollment for qualified undergraduate students with the consent of the instructor. The interdisciplinary nature of research in marine and earth sciences is emphasized; students are encouraged to take courses in several programs and departments, and to select research problems of interdisciplinary character. The research vessels and other facilities of the Scripps Institution and its associated laboratories (including the Institute of Geophysics and Planetary

Physics) are available to department students, many of whom participate in oceanographic research at sea.

**THE CURRICULAR PROGRAMS**

**Biological Oceanography** is the field of study concerned with the interactions of populations of marine organisms with one another and with their physical and chemical environment. Since these interactions are frequently complex, and since the concepts and techniques used in investigating the environment and the populations are drawn from many fields, biological oceanography is, of necessity, interdisciplinary. Therefore, studies in physical oceanography, marine chemistry, and marine geology, as well as biology, are pertinent. Research activities in this curriculum include studies of the factors influencing primary and secondary productivity and nutrient regeneration, fishery biology and management, community ecology of benthic and pelagic forms, population dynamics, habitat changes and disruption, systematics, evolution, biogeography, behavior as it affects distribution, and sampling problems. Theoretical, experimental, and direct observational approaches to these problem areas are conducted.

**Marine Biology** is the study of marine organisms, their development, and their adaptations. It is, therefore, concerned with the evolutionary, organismic, genetic physiological and biochemical processes in marine organisms, and the relationship between them and their environment, both biotic, and physical. It encompasses several major areas of modern biology, and is interpreted from the viewpoints gained through understanding the physical and chemical dynamics of the seas. Research activities of faculty members in the curriculum currently include microbiology, ultra-structure, photobiology, barobiology, cardiovascular physiology, biomechanics, comparative biochemistry, comparative and cellular physiology, neurophysiology and behavior, ecology, developmental biology, and distribution and evolution of marine animals and plants.

**Geochemistry and Marine Chemistry** concerns chemical and geochemical processes operating in a broad range of study areas: the oceans, the solid Earth, the atmosphere, marine organisms, polar ice sheets, lakes, meteorites and the solar system. Areas of advanced study and research include: the physical and inorganic chemistry of seawater; ocean circulation and mixing based on chemical and isotopic tracers; marine organic and natural products chemistry; geochemical interactions of sediments with seawater and interstitial waters; geochemistries of volcanic and geothermal phenomena; chemical

exchanges between the ocean and the atmosphere; geochemical cycles of carbon, sulfur, nitrogen and other elements; isotopic geochemistry of the solid earth and meteorites; atmospheric trace gas chemistry; paleoatmospheric composition recorded in polar ice cores and in sediments; and chemistry of lakes and other freshwater systems.

**Geological Sciences** emphasizes the application of observational, experimental, and theoretical methods of the basic sciences to the understanding of the solid Earth, history of ocean, atmosphere, and the solar system. Principal subprograms are marine geology (including aspects of geophysics, geochemistry, paleontology, geomorphology) and petrology. Expedition work at sea and field work on land are emphasized as essential complements to laboratory and theoretical studies. Marine geology is the field of study concerned with the origin, properties, and history of ocean basins and with the geological processes that affect them. Research areas include tectonics and volcanism; geomorphology, structure, and deformation of the oceanic crust and continental margins, utilizing both geophysical and geological techniques; deep sea and continental margin sedimentation, stratigraphy, and paleontology; and beach and nearshore processes. Petrology is the study of the origin and history of the rock complexes of the Earth's crust and upper mantle, with emphasis on the igneous, metamorphic, and sedimentary rocks of the ocean basins and their margins, the characteristics and interrelations of the oceanic and continental crust, and studies of lunar and meteoritic materials.

**Geophysics** emphasizes the application of general principles of mathematics and experimental physics to fundamental problems of the oceans, oceanic and continental lithosphere, and crust and deep interior of the Earth. Research interests of the group include: observational and theoretical studies of electric and magnetic fields in the oceans and on the land; paleomagnetism; theoretical seismology with special emphasis on the structure of the Earth from free-oscillation and body wave studies; broadband observational seismology, including ocean bottom and multi-channel seismology; earthquake source mechanisms; the measurements of slow crustal deformations using satellite and observatory methods on continents and in the oceans; marine geodynamics and tectonophysics; experimental non-Newtonian gravity measurements; geophysical inverse theory; magnetohydrodynamics of the core of the Earth; geophysical instrumentation for oceanic and continental geophysical measurements; acoustic propagation in the oceans.

**Physical Oceanography** is the field of study that deals with mechanisms of energy transfer

through the sea and across its boundaries, and with the physical interactions of the sea with its surroundings, especially including the influence of the seas on the climate of the atmosphere. Research activities within this curricular group are both observational and theoretical and include: study of the general circulation of the oceans, including the relations of ocean currents to driving forces and constraints of the ocean basins; fluctuations of currents, and the transport of properties; the mechanisms of transport of energy, momentum, and physical substances within the sea and across its boundaries; properties of wind waves, internal waves, tsunami and planetary waves; the thermodynamic description of the sea as a system not in equilibrium; optical and acoustic properties of the sea; and the influence of surf on near-shore currents and the transport of sediments.

**Applied Ocean Sciences** is an interdepartmental program concerned with humans' purposeful and useful intervention into the sea. The program combines the interests of faculty members of the Scripps Graduate Department, the Department of Applied Mechanics and Engineering Sciences, and the Department of Electrical and Computer Engineering to produce oceanographers who are knowledgeable of modern engineering and engineers who know about the oceans. Instruction and research are not restricted to structural, mechanical, material, electrical, and physiological problems of operating within the ocean but include the applied environmental science of the sea as well. Since physical, chemical, geological, and biological aspects of the oceans and all forms of engineering may be involved, the curriculum provides maximum flexibility in meeting the needs of each individual student. Present research activities within the curricular group include studies of: deep circulation and deep fish populations; deep-sea autonomous vehicles, instruments, basic control devices, and special collecting gear; seismic surveys of the mantle; ocean bottom microseisms and crustal displacements associated with earthquakes; surveys of bathymetric-magnetic trends; design and construction of special purpose ocean vehicles (ships, submarines, platforms such as FLIP); remotely operated cable-connected vehicles and stations on the sea floor; sonar systems and sonar signal processing equipment; underwater lasers; remote sensing of sea-surface temperature, roughness, and marine resources from aircraft and orbital spacecraft; meteorology above the oceans; turbulent flows, formation of barrier beaches; mechanisms of currents, sand transport, and sediment transport in the surf zone, the shelf, and in submarine canyons; studies of air-sea interaction.

### REQUIREMENTS FOR ADMISSION

Candidates for admission should have a bachelor's or master's degree in one of the physical, biological, or earth sciences; in some cases a degree in mathematics or engineering science is accepted. The student's preparation should include:

1. Mathematics through differential and integral calculus.
2. Physics, one year with laboratory (the course should stress the fundamentals of mechanics, electricity, magnetism, optics and thermodynamics, and should use calculus in its exposition).
3. Chemistry, one year with laboratory.
4. An additional year of physics, chemistry, or mathematics.
5. Applicants for admission are required to submit scores on the aptitude test (and, for marine biology only, the advanced biology test) of the Graduate Record Examinations given by the Educational Testing Service of Princeton, New Jersey.

Specific additional requirements for admission to the various curricular programs are as follows:

**Biological oceanography**—two years of chemistry, including general and organic chemistry (physical chemistry requiring calculus may be substituted for physics requiring calculus where a more elementary physics course was taken); and a year of general biology (or zoology or botany). Normal preparation should also include a course in general geology and at least one course in the following three categories: systematics (e.g., invertebrate zoology), population biology (e.g., ecology), functional biology (e.g., embryology). In special cases other advanced courses in mathematics or natural sciences may be substituted for one or more of the above.

**Marine biology**—a major in one of the biological sciences (or equivalent), with basic course work in botany, microbiology, or zoology; two years of chemistry, including organic (biochemistry and physical chemistry will be expected of students in experimental biology, although the student may, if necessary, enroll in these courses after admission). Training in one or more of the following areas is strongly recommended: cellular biology, molecular biology, comparative physiology, genetics, developmental biology, ecology, comparative anatomy, vertebrate and invertebrate zoology, microbiology, and botany.

**Geochemistry and marine chemistry**—major in chemistry, geology, biochemistry, or related field.

**Geological sciences**—major in one of the earth sciences or physical or inorganic chemistry. Physical chemistry and calculus are required, and preparation beyond the minimum require-

ments in mathematics, physics, and chemistry is strongly recommended.

**Geophysics**—major in physics or mathematics, or equivalent training.

**Physical oceanography**—major in a physical science, including three years of physics and mathematics.

**Applied ocean sciences**—major in physical science or engineering science, including three years of physics or applicable engineering and three years of mathematics at college level.

Candidates with preparation different from that given above can be admitted only if their undergraduate or previous graduate record has been outstanding. It is possible to make up most shortcomings in preparation with courses available at UCSD.

### PROGRAMS OF STUDY

Because of limited facilities, the department does not encourage students who wish to proceed only to the M.S. If circumstances warrant, the degree is normally offered under Plan II (comprehensive examination) after completion of course work established by the department.

**Thesis Plan I:** A course of study must include forty-eight units of credit. Of the forty-eight units, twenty-four units in graduate courses, including at least sixteen units in graduate-level courses in the major field; sixteen additional units in graduate or upper-division courses; and eight units in research work leading to the thesis.

**Comprehensive Examination Plan II:** A course of study must include forty-eight units of credit. Of the forty-eight units, thirty-two units in graduate courses, including at least twenty units in graduate-level courses in the major field; and sixteen additional units in graduate or upper-division courses.

The program of study for the Ph.D. degree is determined in consultation with the student's adviser (after the first year, the chair of the student's guidance or doctoral committee). General requirements of the curricular groups are as follows:

### BIOLOGICAL OCEANOGRAPHY

The student will be expected to be familiar with the material presented in the following courses: SIO 205A, 205B, 210A, 240, 260, 270, 280, and one of 274, 284, or 294A. Other course work ordinarily will be recommended by the student's advisory committee, usually including 278 (or equivalent) one quarter of each year and at least one advanced-level course in physical, chemical, or geological oceanography. Participation in an oceanographic cruise (minimum of two weeks' duration) is required. There is no formal language requirement. Individual advisers and/or



doctoral committees may require foreign languages of individual candidates.

### **MARINE BIOLOGY**

Entering graduate students will be encouraged to gain a varied research experience in several laboratories during their first year. In the spring term of their first year at SIO, students will take the departmental examination, at which time they will be expected to demonstrate competence in general biology and in the material covered in the following courses: SIO 210A, 240, 260, 280, as well as any other course work recommended by the advisory committee. All students are expected to enroll and actively participate in a seminar course during two quarters of each year. There is no formal language requirement. However, individual advisers and/or doctoral committees may require appropriate foreign languages of individual candidates.

### **GEOCHEMISTRY AND MARINE CHEMISTRY**

Depending upon their personal needs and research interests as determined in consultation with a faculty adviser, students in this curriculum will be expected to take SIO and UCSD courses in some of the following disciplines: marine chemistry, physical oceanography, marine geology, marine biology, biological oceanography, chemistry, and mathematics. There is no general language requirement: each candidate's doctoral committee will decide at the time of the qualifying examination whether there shall be a language requirement to be satisfied prior to the final examination, and if so, which language(s) will be acceptable.

### **GEOLOGICAL SCIENCES**

The geological sciences curricular group offers programs leading to the Ph.D. either in earth sciences or oceanography. The only general requirement is responsibility for material offered in Essentials of Geology (SIO 248A-B-C-D), and participation in the Classics Seminar (SIO 258A-B-C-D) during the first two years of graduate studies. The "basic" courses (SIO 210A, 260, and 280) as well as active participation in research at sea are considered essential for the oceanography degree. Some, or all, of these courses will normally be taken by candidates for the earth sciences degree. Other courses in oceanography and related areas will be selected and scheduled depending on the student's background and interests. In some cases a student's program may include course work in selected subject areas given at other campuses. Normally students will take a comprehensive department

examination near the end of their third quarter of residence. The doctoral qualifying examination will be given during the second year of residence. There is no formal language requirement.

### **GEOPHYSICS**

There is no single course of study appropriate to the geophysics curriculum; instead, the individual interests of the student will permit, in consultation with the adviser, a choice of course work in seismology, geomagnetism, etc. Every student, however, will be required to have knowledge of one or more of the ocean sciences. In the summer or early fall quarter of the second year of residence each student will be given written and oral departmental examinations, which are intended to cover the student's formal training. A brief presentation of possible research interests will also be expected at this exam. There is no formal language requirement.

### **PHYSICAL OCEANOGRAPHY**

Students in this curricular program will be expected to demonstrate proficiency in the subjects treated by the following courses: SIO 210A, 211A-B-C, 212A-B, 214A-B, 220, 221, AMES 294A-B-C, one of SIO 240, 260, or 280 plus two additional SIO courses selected with approval by the student adviser. There is no formal language requirement.

### **APPLIED OCEAN SCIENCES**

Students must: (a) take or demonstrate their knowledge of the following basic courses: SIO 210A, 240, 260, 280, and Math. 210A-B-C or AMES 294A-B-C, and (b) attend the Applied Ocean Sciences Seminar (SIO 208) throughout their period of enrollment. Additional course requirements for a field of emphasis in a complementary discipline will be established to meet the needs and interests of each individual student by the advisory committee. There is no formal language requirement.

### **LANGUAGE REQUIREMENTS**

The department has no formal language requirements. Within the department, some curricular programs may require demonstration of ability to use certain foreign languages pertinent to a student's research. All students must be proficient in English.

### **DEPARTMENTAL AND QUALIFYING EXAMINATIONS**

Doctoral candidates normally will be required to take a departmental examination not later than early in the second year of study. The examina-

tion will be primarily oral, although written parts may be included. The student will be required to demonstrate in quantitative and analytical manner comprehension of required subject material and of the pertinent interactions of physical, chemical, biological, or geological factors.

After the student has passed the departmental examination, and has completed an appropriate period of additional study, the department will recommend appointment of a doctoral committee. This committee will determine the student's qualifications for independent research, normally by means of a qualifying examination late in the second year of study or early in the third year, and will supervise the student's performance and reporting of his or her research.

The nature of the qualifying examination varies between curricular groups. In biological oceanography, marine biology, geological sciences, physical oceanography, and applied ocean sciences, the student will be expected to describe his or her proposed thesis research and satisfy the committee, in an oral examination, as to mastery of this and related topics. In geochemistry and marine chemistry, the student, in an oral examination, is required to present and defend a single research proposition in his or her specialized area. The student is also required to provide a written summary of the research proposition, with references, prior to the examination. In geophysics, the student presents an original research problem, in the form of a written proposition, to the candidacy committee. The student's oral presentation and defense of this proposition completes the examination.

### **DISSERTATION**

A requirement for the Ph.D. degree is the submission of a dissertation and a final examination in which the thesis is publicly defended. We encourage students to publish appropriate parts of their theses in the scientific literature. In some cases, individual chapters are published as research articles prior to completion of the entire thesis.

### **DEPARTMENTAL PH.D. TIME LIMIT POLICIES**

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed seven years. Total registered time at UCSD cannot exceed eight years.

### **SPECIAL FINANCIAL AIDS**

In addition to teaching and research assistantships, fellowships, traineeships and other awards available on a campus-wide competitive basis, the department has available a certain number of



fellowships and research assistantships supported from research grants and contracts, or from industrial contributions.

## Courses

### UPPER DIVISION

#### 198. Directed Group Study (2-4)

Directed group study on a topic or in a field not included in the regular department curricula, by special arrangement with a faculty member. (P/NP grades only.) *Prerequisite: consent of instructor.* Staff (F,W,S)

#### 199. Special Studies (2 or 4)

Independent reading or research on a problem by special arrangement with a faculty member. (P/NP grades only.) *Prerequisite: consent of instructor.*

### GRADUATE

#### 201. Topics in the History of Ocean Sciences (4)

Intensive study of specific problems in the history of the ocean sciences, and of related earth and atmospheric sciences, in the modern period. Topics vary from year to year, and students may therefore repeat the course for credit. Rudwick, Friedman (W)

#### 202. Introduction to Climate and Climate Change (4)

Physical, dynamical, and thermodynamic processes that govern climate with emphasis on the atmosphere and the oceans. Topics will include energy budget of the oceans and the atmosphere, hydrological cycle, the meridional heat transport, and climate forcing and feedbacks that govern decadal to longer-term changes in climate. *Prerequisites: introductory courses in atmospheric sciences and oceanography; familiarity with solutions of linear differential equations.* Ramanathan (S)

#### 204A. Advanced Acoustics I (4)

Boundary value problems in vibrating systems, wave propagation in strings, bars, and plates. Fundamentals of acoustical transducers. *Prerequisite: concurrent registration in ECE 145AL recommended.* Anderson, Hildebrand (F)

#### 204B. Advanced Acoustics II (4)

Theory of radiation, transmission and scattering of sound with special application to ocean acoustics. *Prerequisite: concurrent registration in ECE 145BL recommended; SIO 204A or consent of instructor.* Anderson, Hildebrand (W)

#### 204C. Advanced Acoustics III (4)

Signal processing in underwater acoustics. Theory and hardware embodiments. *Prerequisite: concurrent registration in ECE 145CL recommended; SIO 204B or consent of instructor.* Anderson, Hildebrand (S)

#### 205A. Applied Parametric Statistics (4)

Methods of parametric statistics with emphasis on these procedures particularly useful in marine studies. Measures of central tendency and dispersion, testing for goodness of fit, hypothesis testing, analysis of variance, regression and correlation analysis, and circular statistics. Offered in alternate years. (S/U grades permitted.) Hodgkiss (W)

#### 205B. Applied Nonparametric Statistics (4)

Methods of nonparametric statistical analysis, sampling, and experimental design with emphasis on those procedures particularly useful in marine studies. Designed to supplement 205A or equivalent parametric statistics courses. Offered in alternate years. *Prerequisite: elementary statistics or consent of instructor.* Venrick (S)

#### 207A. Digital Signal Processing I (4)

Sampling; A/D and D/A conversion, discrete linear system theory, z-transforms; digital filters, recursive and nonrecursive designs, quantization effects; fast Fourier transforms, windowing, high speed correlation and convoluting; discrete random signals; finite word length effects. *Prerequisites: ECE152A-B-C or equivalent.* (S/U grades permitted.) Hodgkiss (F)

#### 207B. Digital Signal Processing II (4)

Power spectrum estimation; homomorphic signal processing; applications to: speech, radar/sonar, picture, biomedical, and geophysical data processing. *Prerequisite: SIO 207A or consent of instructor.* (S/U grades permitted.) Hodgkiss (W)

#### 207C. Digital Signal Processing III (4)

Single and multichannel data processing in a time varying environment; adaptive filters; high resolution spectral estimation; linear prediction; adaptive beamforming. *Prerequisites: SIO 207A-B or consent of instructor.* (S/U grades permitted.) Hodgkiss (S)

#### 208. Seminar in Applied Ocean Sciences (1)

Topics in applied ocean sciences. One hour seminar. (S/U grades only.) Staff (F,W,S)

#### 209. Special Topics (1-4)

Within the next few years, lectures on various special subjects will be offered by members of the staff. The emphasis will be on topics that reveal the interdependence of the biological, chemical, geological, and physical processes operating in the oceans. (S/U grades permitted.) Staff (F,W,S)

#### 210A. Physical Oceanography (4)

Physical description of the sea; physical properties of seawater, methods and measurements, boundary processes, regional oceanography. *Prerequisites: the mathematics and physics required for admission to the graduate curriculum in the Scripps Institution of Oceanography (see text), or consent of instructor.* Hendershott (F)

#### 211A-B-C. Ocean Waves (4-4-4)

Propagation and dynamics of waves in the ocean including the effects of stratification, rotation, topography, wind, and non-linearity. *Prerequisites: SIO 210A, SIO 211A or 214A or prior consent of instructor prerequisite for 211B.* Young, Hendershott, Pinkel, Salmon, Guza (F,W,S)

#### 212A-B. Dynamical Oceanography (4-4)

The equations of motion for rotating stratified flow and their application to large-scale ocean dynamics; the wind-driven circulation, flow over topography, and the dynamics of two-layer models. *Prerequisite: SIO 214 or consent of instructor.* Salmon, Talley (F)

#### 213. Ocean Turbulence and Mixing (4)

Mixing mechanisms, their identification, description and modeling. Introduction to turbulence, semi-empirical theories, importance of coherent structures, effects of stratification and rotation on turbulent structure, entrainment and mixing. (S/U grades permitted.) Armi (S)

#### 214A-B. Introduction to Fluid Mechanics (4-4)

A survey of classical problems in fluid mechanics and approximate techniques of analysis. Topics include conservation equations, straight laminar flows, low and high Reynolds number laminar flow, stability of laminar flows, turbulent flow. *Prerequisite: partial differential equations.* Winant, Young (F,W)

#### 215. Introduction to Atmospheric Radiative Transfer (4)

Introduces elementary concepts in electromagnetism and quantum mechanics to explain scattering, absorption and emission by gases, aerosols, and clouds. Elegant analytical solutions to the transfer equation will be employed in conjunction with satellite and laboratory measurements to consider phenomena such as the CO<sub>2</sub> greenhouse effect, albedo effect of clouds, color of the skies and atmospheric radiative cooling. *Prerequisite:*

*sites: undergraduate courses in physics and differential calculus.* Ramanathan (S)

#### 216A. Physics of Sediment Transport (4)

Mechanics and energetics of sediment transport by water, wind, waves, and density flows. Types of flow systems, mechanics of granular and fluid media, their interactions and transport relations; and the generation and formation of bed forms under waves and currents. Lectures, laboratory, and demonstration sessions. *Prerequisite: consent of instructors; SIO 214, 211A recommended.* Inman, Jenkins (W)

#### 216B. Coastal Processes (4)

Coastal science and engineering for beaches, lagoons, and harbors. Coastal response to forcing by waves, winds, and runoff. Application of budget of energy and sediment to typical coastal areas including mountainous, plains, arctic, and tropical. *Prerequisite: SIO 216A or consent of instructor.* Inman, Jenkins (S)

#### 217. Numerical Methods in Geophysical Fluid Dynamics (4)

Useful numerical methods of simulating the large-scale dynamics of oceans and atmospheres: fundamental concepts, classification of problems, introduction to discrete variable methods, stability, convergence, error analysis, elementary properties of finite-difference schemes, implicit methods, spectral methods, nonlinear problems. (Offered in odd-numbered years.) (S/U grades permitted.) Somerville (W)

#### 218. Atmospheric Dynamics and Physics (4)

Thermodynamics and statics of dry and moist air; equations of motion, scale analysis, elementary applications and wave solutions; baroclinic instability theory; atmospheric general circulation and energetics; thermal convection and laboratory analogues to atmospheric motions; turbulence and predictability theory; numerical models for weather forecasting and climate simulation. (Offered in even-numbered years.) (S/U grades permitted.) Somerville (F)

#### 219. Special Topics in Physical Oceanography (1-4)

Example topics are case histories and methods in physical oceanography, theories of the ocean circulation, numerical methods in large-scale ocean and atmospheric models, and natural electromagnetic phenomena in the earth and the oceans. (S/U grades permitted.) Staff (F,W,S)

#### 220. Observations of Large-Scale Ocean Circulation (4)

General circulation of the oceans; tropical, subtropical, and high-latitude current systems of the Atlantic, Indian, and Pacific Oceans and marginal seas; ocean heat flux and thermohaline circulations; observational basis of large-scale dynamics. *Prerequisite: SIO 210A.* (S/U grades permitted.) Roemmich (W)

#### 221. Analysis of Physical Oceanographic Data (4)

Techniques for analysis of physical oceanographic data involving many simultaneous processes including probability densities, sampling errors, spectral analysis, empirical orthogonal functions, correlation, linear estimation, objective mapping. *Prerequisite: consent of instructor.* (S/U grades permitted.) Davis (S)

#### 222. Tensors in Geophysics (4)

Tensors as geometrical objects rather than arrays of components. Applications, depending on class background, chosen from among plate tectonics, earth rotation, tides, geomagnetism, continuum mechanics (stress, strain, constitutive relations, dislocations), seismic source theory, flow in porous media. *Prerequisite: consent of instructor.* (S/U grades permitted.) Backus (F)

#### 223. Geophysical Data Analysis (4)

Design of geophysical experiments and analysis of geophysical measurements, interpretation of geophysical time series; sampling, least squares, spectrum analysis. Staff (W)

**224. Internal Constitution of the Earth (4)**

An examination of current knowledge about the composition and state of the earth's interior revealed by geophysical observations. Seismic velocity and mass density distributions; equations of state; phase changes; energy balance and temperatures; constraints on composition from extraterrestrial samples and exposed rocks; spherical and aspherical variations of properties. *Prerequisites: calculus and differential equations, basic chemistry and physics, or consent of instructor.* Staff (S)

**226. Introduction to Marine Geophysics (4)**

Methods of exploration geophysics with emphasis on those useful at sea. Magnetic and gravitational potential field methods, multi-beam echo sounding reflection and refraction seismology will be covered. Recent papers from the literature will also be read and discussed. *Prerequisites: differential equations; at least one geology course.* (S/U grades permitted.) Dorman, Hildebrand (W)

**227A. Introduction to Seismology (4)**

Introduction to seismometers and seismograms; stress and strain; potentials and the wave equation; geometrical ray theory and travel times in layered media; representation of seismic sources; WKBJ and synthetic seismograms; seismic hazards and other applications of seismology. *Prerequisite: consent of instructors.* (S/U grades permitted.) Staff (F)

**227B. Advanced Seismology I (4)**

Introduction to low-frequency digital data; continuum mechanics and the equations of motion; free oscillation solutions; construction of Earth models; excitation of free-oscillations and source mechanism retrieval; array processing of long-period data; modelling aspherical structure; surface waves. *Prerequisite: consent of instructors.* (S/U grades permitted.) Staff (W)

**227C. Advanced Seismology II (4)**

High-frequency wave propagation; methods for computing synthetic seismograms including WKBJ, reflectivity and finite differences; body-wave spectra; attenuation of body waves; source physics; reflection and refraction seismology; seismic tomography. *Prerequisite: consent of instructors.* (S/U grades permitted.) Staff (S)

**229. Geomagnetism and Paleomagnetism (4)**

A course describing the observations (field elements, internal sources, secular variations, reversals), theory (Maxwell's and Laplace's equations, spherical harmonics, rock magnetization, disk dynamos), measurements (paleomagnetic techniques, magnetometers, marine and satellite data), and resulting models (spherical harmonic field models, apparent polar wander, the magnetosphere and ionosphere). *Prerequisites: advanced calculus, differential equations, complex variables, and familiarity with Maxwell's equations, or consent of instructor.* (S/U grades permitted.) Backus, Parker, Tauxe (F)

**230. Introduction to Inverse Theory (4)**

Solution of linear and nonlinear inverse problems in geophysics by optimization techniques such as norm minimization and linear programming. Construction of models by regularization; inference by bounding functionals. Illustrations from gravity, geomagnetism, and seismology. *Prerequisite: consent of instructor.* (S/U grades permitted.) Parker (W)

**231. Seismological Methods (4)**

Basic instrumentation, seismic noise, spectral analysis, basic elasticity for seismology, earthquake mechanism, earthquake hazard, strong motion, energy and moment, earthquake prediction, seismotectonics. *Prerequisite: consent of instructor.* (S/U grades permitted.) Staff (W)

**234. Geodynamics (4)**

A general course on the dynamics and kinematics of the solid earth based on the text of Turcotte and Schubert. Topics include plate tectonics, heat flow, lithospheric cooling, flexure, viscous flow, global gravity, crustal structure, and other related topics. *Prerequisite: familiarity with partial differential equa-*

*tions and Fourier transforms.* (S/U grades permitted.) Sandwell, Phipps Morgan (W)

**235A-B. Geodesy (4-4)**

An introduction to the science and technology of determining the Earth's shape and gravity field with emphasis on applying this knowledge to geophysical problems. We will discuss both terrestrial measurement methods and the newer space-geodetic techniques. Additional topics include geometric and gravimetric geodesy, geodetic astronomy, and adjustment procedures, with special attention to the determination of crustal deformation. *Prerequisite: consent of instructor.* (S/U grades permitted.) Agnew, Bock (W)

**237. Geomagnetism (4)**

Foundations of magnetohydrodynamics. Survey of dynamo theories. Mantle electromagnetism. Core-mantle coupling. Frozen flux and geostrophic hypotheses for secular variation. Use of satellite and surface data to test hypotheses and to estimate parameters (e.g., sunspot cycles, magnetic jerks, use of prior information). *Prerequisite: SIO 229; consent of instructor.* (S/U grades permitted.) Backus (S)

**239. Special Topics in Geophysics (1-4)**

Special course offerings by staff and visiting scientists. Example topics are seismic source theory, geophysical prospecting methods, dislocation theory and seismic mechanisms, tectonic interpretation of geodetic data, and dynamo theory. (S/U grades permitted.) Staff (F,W,S)

**240. Marine Geology (4)**

Introduction to the geomorphology, sedimentation, stratigraphy, vulcanism, structural geology, tectonics, and geological history of the oceans. *Prerequisites: the physics and chemistry required for admission to the graduate curriculum in SIO, and ES 101 or equivalent, or consent of instructor.* Staff (W)

**241. Continental Margins (4)**

Sediments, sedimentary environments, structure, tectonics and evolution of both passive and active continental margins. *Prerequisite: undergraduate degree in geology or consent of instructor.* (S/U grades permitted.) Curray (F)

**242. Controversies in Geomorphology (4)**

Conflicting ideas regarding the relation between physical processes which shape the Earth's surface and the resulting landforms are studied (a) through a critical examination of the literature, (b) using visualization of computer simulations, and (c) in two weekend field trips. *Prerequisite: consent of instructor.* (S/U grades only.) Werner (S)

**243. Marine Stratigraphy (4)**

Selected topics of current interest in marine stratigraphy, e.g., sequence stratigraphy, seismic stratigraphy, sea level change, plate stratigraphy, stratigraphic resolution, correlation, and the relations of stratigraphy to tectonics. The course content will change from year to year. Offered in alternate years. *Prerequisite: preparation at the level of SIO 248C-D or consent of instructor.* (S/U grades permitted.) Winterer (S)

**244. Seminar in Sedimentary Petrology (4)**

Discussions of current research in sedimentary mineralogy, geochemistry, and petrology. The subject(s) will vary from year to year. (S/U grades permitted.) Kastner (W)

**245A. Sedimentary Petrology (4)**

Characteristics and origin of sediments and sedimentary rocks. *Prerequisite: consent of instructor.* Winterer (W)

**245B. Sedimentary Geochemistry and Mineralogy (4)**

Principles of chemical sedimentology; structure and composition of sedimentary minerals; fluid-sediment interaction, processes and rates; application of stable isotopes to environmental problems. *Prerequisites: consent of instructor; mineralogy, geochemistry, sedimentary petrology, and physical chemistry are recommended.* Kastner (F)

**247. Rock Magnetism and Paleomagnetism (4)**

Rock magnetism and acquisition of magnetic remanence in geological materials as well as laboratory procedures and data analysis (isolating remanence components and statistical approaches). The paleomagnetic literature will be used to illustrate applications in geological and geophysical problems. *Prerequisites: one year each of college-level physics and geology; math through calculus.* (S/U grades permitted.) Tauxe (W)

**248A-B-C-D. Essentials of Geology (4-4-4-4)**

A rigorous, synoptic sequence of courses for entering graduate students covering major aspects of geology with emphasis on marine problems. **Geophysics and Tectonics:** plate tectonics, geophysics and tectonics of the crust and upper mantle, spreading centers, plate interiors, and continental margins. **Geochemistry and Crustal Evolution:** formation of the earth and terrestrial planets, chemical differentiation of the earth, magmatic systems in different tectonic settings, isotope and trace element geochemistry of igneous and metamorphic rocks. **Marine Sediments—Distribution and Processes:** types of sediments present on the seafloor and processes responsible for the observed distributions in nearshore and shelf environments, continental slope and deep sea. Includes physical and geochemical processes, diagenesis, hydrothermal systems and principles of paleoclimatology. **Paleoceanography:** the Record in the Rocks—approaches to the interpretation of the stratigraphic record of marine sediments, in terms of paleoceanography, tectonics, sedimentary processes and biotic evolution. *Prerequisite: bachelor's degree in geology/earth sciences or consent of instructor.* (S/U grades permitted.) Staff (F,W,S)

**249. Special Topics in Marine Geology (1-4)**

Special course offerings by staff and visiting scientists. (S/U grades permitted.) Staff (F,W,S)

**250. Coastal Marine Geochemistry (4)**

A survey of chemical reactions in estuaries, lagoons, and coastal marine waters. Fundamentals of river and ocean water chemistries. Coastal sedimentation processes. Geochronologies applicable to inshore systems. Goldberg (W)

**251. Thermodynamics of Natural Processes (4)**

Applications of thermodynamics to general problems in the earth sciences. Topics include chemical and phase equilibria in heterogeneous multicomponent systems; properties of substances at high temperatures and pressures; models for solid solutions and gaseous mixtures; phase equilibria in silicate melts; adiabatic and pseudo-adiabatic transport; steady-flow systems; closed and open system models of the atmosphere, oceans, and solid earth. *Prerequisites: Chem. 102A or 202A, or Phys. 140, Math. 2D or equivalent.* Craig (W)

**252A. Nuclear Geochemistry (4)**

Geochemistry of stable and radioactive isotopes, with emphasis on oceanic and atmospheric applications. Topics include mixing and circulation studies in the ocean, atmosphere-sea interaction, the carbon cycle, volcanic contributions to the atmosphere and ocean, isotope fractionation effects and stable isotope variations in minerals and rocks. *Prerequisites: Mathematics 2D or equivalent, SIO 210A.* (S/U grades permitted.) Craig (W)

**252B. Nuclear Geophysics and Oceanography (4)**

Nuclear methods in geophysics and oceanography with emphasis on applications of natural cosmic ray produced nuclides and U, Th series nuclides; their source functions, applications, and mathematical models will be discussed. These methods include trace element geochemistry; mixing and transfer of substances between the atmosphere, hydrosphere, and the lithosphere; secular variations in the carbon cycle, rates of erosion of natural rock and soil surfaces, and biodynamics of phosphorous in the upper layers of the oceans. *Prerequisite: consent of instructor.* Lal (S)

**252C. Isotope Geology (4)**

Radioactive and stable isotope studies in geology, including geochronology, isotopes as tracers of magmatic processes, cosmic ray produced isotopes as tracers in the crust and weathering cycle, isotopic evolution of the crust and mantle. Offered in alternate years. *Prerequisite: SIO entrance requirements or consent of instructor.* (S/U grades permitted.) Macdougall, Lal (S)

**253. Igneous and Metamorphic Petrology (4)**

Physical, chemical, and mineralogic properties of igneous and metamorphic rocks. Emphasis is on the origin and genetic relationships as interpreted from field occurrences, theoretical studies, and experimental data. *Prerequisite: physical geology; geochemistry, mineralogy, physical chemistry (may be taken concurrently).* Hawkins (F)

**254. Advanced Igneous Petrology (4)**

The origin and evolution of igneous rocks is considered in terms of field and laboratory evidence. Experimental and theoretical studies bearing on igneous processes are discussed and evaluated in the light of geologic occurrences. Special emphasis is given to igneous rocks of the ocean basins and their margins. Typical rock types are analyzed in the laboratory, and their history is interpreted. *Prerequisite: consent of instructor.* Hawkins (S)

**255. Crustal Evolution (4)**

Comprehensive discussion of the distribution, age, physical and chemical properties, petrogenesis, and evolution of rocks of the earth's crust. *Prerequisite: one year of graduate study in SIO or consent of instructor.* (S/U grades permitted.) Hawkins, Macdougall (W)

**256A. Field Geology (4)**

Geologic mapping of selected areas and preparation of geological reports. Field work is done on weekends in local areas. *Prerequisites: consent of instructor; to be taken concurrently with SIO 256L.* (S/U grades permitted.) Staff (W)

**256B. Earth Sciences Spring Field Trip (1)**

Classical areas of the southwestern United States, such as the Colorado Plateau, Mojave Desert, Sierra Nevada and the Peninsular Range, are examined in successive years during six-day field trips. Normally required of all first- and second-year graduate students in marine geology. (S/U grades only.) Staff (S)

**256L. Laboratory Exercises in Field Geology (2)**

Principles of stratigraphy and structural geology applicable to field geologic studies. Discussion and laboratory exercises. *Prerequisites: consent of instructor; to be taken concurrently with SIO 256A.* (S/U grades permitted.) Staff (W)

**257. Seminar in Petrology (4)**

Discussion of current research in petrology and mineralogy. (S/U grades permitted.) Hawkins (W)

**258A-B-C-D. Classics Seminar (1-4)**

A discussion class usually held in conjunction with SIO 248A-B-C-D. Classic papers dealing with topics discussed in 248 will be read and discussed. Normally required of all first- and second-year students in geological sciences. (S/U grades only.) Staff (F,W,S)

**259. Atmospheric Geochemistry (4)**

Topics in this introductory course include: composition and chemical state of the atmosphere, basic thermodynamics and open systems, water and gas exchange with the ocean, isotope geochemistry of atmospheric gases, trace gases (CH<sub>4</sub>, N<sub>2</sub>O, etc.), rates of increase, and climatic effects, early history and chemistry of the atmosphere, introduction to photochemistry. (S/U grades only.) Craig (W)

**260. Marine Chemistry (4)**

Chemical description of the sea; the distribution of chemical species in the world oceans, and their relationships to physical, biological, and geological processes. Gieskes (F)

**261. Energetics and Kinetics in Marine Chemistry (4)**

The consideration of seawater as an electrolyte solution with emphasis upon its structure and physical-chemical properties. Thermodynamic considerations of mixed electrolyte solutions with particular reference to seawater. *Prerequisite: Chem. 202A.* Gieskes, Dickson (S)

**262. Seminar in Marine Natural Products (1)**

Students will give seminars on current research topics in marine natural products chemistry. *Prerequisite: consent of instructors.* (S/U grades only.) Faulkner, Fenical (F,W,S)

**263. Major Chemical Cycles in the Sea (4)**

The distribution of chemical species in the world oceans and their relation to physical and biological processes, with emphasis on transport and exchange. Keeling (S)

**264. Solids in Nature (4)**

Experimental and theoretical evaluation of geologically important properties of solids. Characteristic differences between solid types, electronic structure of solids, microscopic significance of thermodynamic concepts. Interaction between matter and radiation, structure of geologically important crystals and glasses, order and disorder. Band structure of solids, excited states, the dynamic of phase change. Conductivity, magnetic, and optical properties of solids with particular consideration of geological systems. *Prerequisite: consent of instructor.* Arrhenius (W)

**265. Marine Natural Products Chemistry (4)**

An outline of the organic chemicals from marine organisms with special reference to their function in the marine environment. The differences between terrestrial and marine natural products will be stressed. *Prerequisite: basic organic chemistry.* Faulkner, Fenical (W)

**266. Geochemistry of Organic Compounds (4)**

Distribution, sources, and stability of organic compounds in the geological environment. Major emphasis will be on the synthesis of organic compounds on the primitive earth; organic material in ancient rocks and sediments; and the cycle of organic material in the sea. *Prerequisite: organic chemistry; (biochemistry recommended).* Bada (S)

**268. Seminar in Geochemistry and Marine Chemistry (1)**

Student seminars on topics related to geochemistry and the chemistry of the marine environment. (S/U grades only.) Weiss (W)

**269. Special Topics in Marine Chemistry (1-4)**

Special course offerings by staff and visiting scientists. (S/U grades permitted.) Staff (F,W,S)

**270. Pelagic Ecology (4)**

An analysis of the concepts and theories used to explain the biological events observed in the ocean. Alternate years. *Prerequisite: SIO 210A, 280, or consent of instructors.* McGowan, Mullin (W)

**271. Biological Oceanographic Techniques (4)**

An introduction to some shipboard techniques and tools in biological oceanography and related physical and chemical measurements. Enrollment limited to ten. Alternate years. *Prerequisites: SIO 280 and 210A or consent of instructor.* (S/U grades only.) Mullin (S)

**272. Biogeography (3)**

A lecture course concerning the origin, development, and perpetuation of distributional patterns with emphasis on benthic marine organisms. Newman (W)

**273. Professional Ethics in Science (2)**

A seminar on the ethics and ethos of scientific research, based on published cases of unethical behavior. Given in alternate years. (S/U grades only.) Dayton, Mullin (W)

**274. Marine Arthropods (5)**

Lectures and laboratories on the natural history zoogeography, taxonomy and phylogeny of arthropods with emphasis on marine forms. Alternate years. *Prerequisite: consent of instructor.* Hessler (W)

**275A. Topics in Community Ecology (4)**

Maintenance of community structure, with special emphasis on the importance of competition, predation, energetics, and stability as they affect patterns of distribution and abundance; interrelationships between community structure and population phenomena such as trophic specialization, reproductive strategies, and life histories. Alternate years with 275B. *Prerequisite: consent of instructor; open to undergraduates.* (S/U grades permitted.) Dayton (S)

**275B. Natural History of Coastal Habitats (4)**

Two three-hour laboratories per week, three four-six day field trips to sites from Mexico to Monterey Bay. Several one-day field trips to local habitats including lagoons, sand and rock intertidal habitats, areas of marine fossils, and areas with migrating birds. Format of course variable depending on student interests. Alternate years with 275A. *Prerequisite: consent of instructor; open to undergraduates.* (S/U grades permitted.) Dayton (S)

**276. Quantitative Theory of Populations and Communities (4)**

An introduction to the quantitative tools and conceptual issues underlying the study of the dynamics and structure of ecological systems. *Prerequisite: calculus (three quarters) or consent of instructor.* (S/U grades permitted.) Sugihara (F)

**277. Deep-Sea Biology (4)**

The ecology, zoogeography, taxonomy, and evolution of deep-sea organisms, with emphasis on the benthos. Offered alternate years. *Prerequisite: consent of instructor.* (S/U grades only.) Hessler (S)

**278. Problems in Biological Oceanography (2)**

Presentation of reports, review of literature, and discussion of current research in biological oceanography. Seminar. (S/U grades permitted.) Staff (F,W,S)

**279. Special Topics in Biological Oceanography (1-4)**

(S/U grades permitted.) Staff (F,W,S)

**280. Biological Oceanography (4)**

The distribution and abundance of oceanic organisms and the processes regulating patterns and changes. Species, communities, and ecosystems of the oceanic realm. *Prerequisite: bachelor's degree in science or consent of instructor.* Staff (F)

**281. Environmental Physiology and Biochemistry of Marine Organisms (4)**

Biochemical mechanisms of adaptation of organisms to the marine environment. Special emphasis is on the effects of pressure, temperature, salinity, oxygen, and light on the physiology and biochemistry. Conjoined with Biol. 185. *Prerequisites: adequate training in biochemistry and biology and consent of instructor.* Felbeck (W)

**283. Biology of the Higher Marine Vertebrates (3)**

Introduction to evolution, classification, and major marine adaptations of marine reptiles, birds, and mammals. One lecture and laboratory each on reptiles and birds, the remainder on marine mammals (sea otter, sirenians, pinnipeds, and cetaceans). Laboratory sessions on identification and anatomy. *Prerequisite: graduate standing or consent of instructor.* DeMaster, Perrin, Rosenblatt (W)

**284. Invertebrate Zoology (5)**

Invertebrate zoology covering all of the major and minor phyla: Phylogeny, Anatomy, Physiology and Natural History. Lecture and laboratory demonstrations. *Prerequisite: consent of instructors; no audits.* Holland, Hessler (W)

**286. Critiques and Data Reanalyses (4)**

A case-history approach to critical reading of scientific literature. Examples are drawn from reports on ecologically relevant behavior of marine animals; issues covered include tractability of the problem; design of the experiments; and re-examination of the evidence, with an emphasis on statistical analysis and alternative interpretations of the data. *Prerequisites: sound preparation in statistics; consent of instructor.* Enright (W)

**287A. Marine Microbial Ecology (4)**

Recent developments in the study of marine bacteria. Emphasis will be on biochemical and physiological adaptations of marine bacteria to the ocean environment. Bacterial metabolism, growth, and death will also be discussed in the context of trophic interactions and flows of material and energy in marine ecosystems. Molecular biology techniques used in the study of bacterial ecology will also be discussed. *Prerequisite: consent of instructor.* (S/U grades permitted.) Azam (F)

**287B. Microbial Metabolism (4)**

Biochemistry and physiology in relation to metabolic activities and elemental cycles; growth and death of bacteria. *Prerequisite: consent of instructor.* Alternate years. Staff (S)

**288. Recent Advances in Invertebrate Zoology (4)**

Lectures will cover marine invertebrates (exclusive of arthropods) phylum by phylum. After a brief review of fundamentals for each group, significant studies of the last five years or so will be covered. These works will cover mainly anatomy, physiology, comparative embryology, and macroevolution. *Prerequisite: graduate standing or consent of instructor.* (S/U grades permitted.) Holland (S)

**292. Scientific Communication (2)**

Forms of scientific communication, practical exercise in scientific writing and short oral communication and in criticism and editing; preparation of illustrations, preparation of proposals; scientific societies and the history of scientific communication. Examples from any field of science, most commonly biology, marine biology, ecology, and neuroscience. *Prerequisite: graduate status in science.* (S/U grades only.) Bullock (F)

**293A-B. Animal Behavior (4-4)**

(A) Ethological approach. Species characteristics behavior, its causation and adaptive significance. Controversies on "innateness," "drives," and related concepts. Ecology in relation to neurophysiology. (B) Control mechanisms: feedback and feed forward in elementary behaviors associated with orientation and assessment of environment; random processes describing the occurrence of behavioral patterns. *Prerequisites: basic knowledge of calculus and statistics recommended.* Heiligenberg (F,W)

**294A. Biology of Fishes (5)**

The comparative evolution, morphology, physiology, and ecology of fishes. Special emphasis on local and deep-sea and pelagic forms in laboratory. *Prerequisite: graduate standing or consent of instructor.* Rosenblatt (S)

**294B. Seminar in Advanced Ichthyology (2)**

Discussion of special topics related to ichthyology. *Prerequisite: graduate standing or consent of instructor.* (S/U grades only.) Rosenblatt (F)

**295. Current Topics in Developmental Biology (4)**

A collection of lectures with some periods devoted to observations of fertilization and embryogenesis. Various topics of current interest in developmental biology will be discussed. *Prerequisite: consent of instructor.* (S/U grades permitted.) Vacquier (F)

**296. Special Topics in Marine Biology (1-4)**

Example topics are reproduction in marine animals, adaptation to marine environments, larval biology, marine fisheries, macromolecular evolution, physical chemical topics in physiology, philosophy of science. (S/U grades permitted.) Staff (F,W,S)

**297. Marine Biology Seminar (1)**

Lectures given by visiting scientists and resident staff and students. (S/U grades only.) Staff (F,W,S)

**298. Special Studies in Marine Sciences (1-2)**

Reading and laboratory study of special topics under the direction of a faculty member. Exact subject matter to be arranged in individual cases. *Prerequisite: graduate standing.* (S/U grades permitted.) Staff (F,W,S)

**299. Research (1-12)**

(S/U grades permitted.) Staff (F,W,S)

**SOCIAL SCIENCE**

OFFICE: 1512 Galbraith Hall, Revelle College

Social Science 60 is an introduction to statistics which satisfies the statistics requirements in various departments. This course does not require mathematical preparation beyond high school intermediate algebra. The content of the course is oriented towards social science problems and the computer analysis of social science data.

**Courses**

**25. Vietnamese Culture (4)**

This course explores the historical and literary background of Vietnamese culture. *Prerequisites: none.* (W)

**60. Elementary Statistics for the Social Sciences (4)**

Introduction to the basic statistical analysis of social science data, including descriptive and inferential statistics. Included is a laboratory component involving the use of computer-based programs for statistical analysis. Credit not allowed for both Social Science 60 and Psych. 60, Math. 6A. (F,W,S)

**SOCIOLOGY**

OFFICE: 7009 Humanities and Social Sciences Building, Muir College

**Professors**

- Aaron V. Cicourel, Ph.D.
- Bennetta Jules-Rosette, Ph.D.
- Richard P. Madsen, Ph.D.
- Timothy L. McDaniel, Ph.D., *Chair*
- Hugh B. Mehan, Ph.D.
- Chandra Mukerji, Ph.D.
- David P. Phillips, Ph.D.
- Michael S. Schudson, Ph.D.
- Andrew Scull, Ph.D.
- Steven A. Shapin, Ph.D.
- Carlos H. Waisman, Ph.D.

**Associate Professors**

- Rae Lesser Blumberg, Ph.D.
- Stephen E. Cornell, Ph.D.
- Harvey Goldman, Ph.D.
- Jeffrey Haydu, Ph.D.
- Rebecca E. Klatch, Ph.D.
- Gershon Shafir, Ph.D.
- Kathryn A. Woolard, Ph.D.
- Leon Zamosc, Ph.D.

**Assistant Professors**

- Richard G. Biernacki, Ph.D.
- Juan Diez Medrano, Ph.D.
- Ivan T. Evans, Ph.D.
- Ali Gheissari, Ph.D.
- Martha Lampland, Ph.D.
- Akos Rona-Tas, Ph.D.
- Ricardo D. Stanton-Salazar, Ph.D.
- Christena Turner, Ph.D.

**Associate Adjunct Professor**

- Mary L. Walshok, Ph.D.

**Assistant Adjunct Professor**

- Yen Espiritu, Ph.D.

**Emeritus**

- Bennett M. Berger, Ph.D.
- Fred Davis, Ph.D.
- Jack D. Douglas, Ph.D.
- Joseph R. Gusfield, Ph.D.
- Jacqueline P. Wiseman, Ph.D.

**SOCIOLOGY AT UCSD**

Sociology studies societies and human groups: their composition, organization, culture and development. It combines scientific and humanistic methods to investigate a subject that is both relevant and broad—ranging from social interaction in everyday life to social changes taking place on a global scale. The Department of Sociology at UCSD offers an innovative program that covers the breadth of the discipline while giving students opportunities to specialize in areas of their choice, to conduct independent research, and to participate in an Honors Program. The department also encourages majors to study abroad and to take courses in other humanities and social science departments in order to expand their perspective on sociological topics.

Students at UCSD can explore a full range of sociological inquiry through courses in such established fields as Third World development, law, culture, social movements, race and ethnic relations, gender roles, medicine, and mental illness. In addition, students have the opportunity to participate in courses found in few other sociology departments, such as the politics of language, ethnographic film, the sociology of time, com-



parative sex stratification, mass media, and revolutions. The faculty also teach an exceptional array of courses focusing on specific societies or world regions, including the Middle East, Africa, Japan, China, Latin America, eastern Europe, the Soviet Union, and the United States.

Thus sociology is a valuable major for students who want to enter law, medicine, architecture, business, or politics. It also provides a solid liberal arts education for students who plan careers in such fields as criminal justice, public health, urban planning, social welfare, counseling, public administration, international relations, or market research. For students who wish to pursue graduate study in the social sciences for careers in teaching or scholarly research, an undergraduate degree from the Department of Sociology will provide a thorough grounding in recent theoretical and methodological advances in the discipline. A sociology major offers excellent preparation for teaching in the elementary schools. If you are interested in earning a California teaching credential from UCSD, contact the Teacher Education Program for information about the prerequisite and professional preparation requirements. It is recommended that you contact TEP as early as possible in your academic career. Whatever the career choice, the study of sociology can help the student cultivate a critical awareness of social life.

Students interested in majoring or minoring in sociology should stop by the Department of Sociology office, H&SS 7009, for a brochure on the program and a student handbook. These clarify specific procedures and guidelines, and provide recommendations for areas of specialization within the major, as well as for graduate studies and careers in sociology.

## THE UNDERGRADUATE PROGRAM

### THE MAJOR

To receive a B.A. with a major in sociology, students must complete three lower-division and twelve upper-division courses in sociology, including the required courses listed below, and a course in elementary statistics (Social Science 60).

A 2.0 GPA is required in the major (D's and F's are not applicable, effective fall 1986). *No courses taken to apply toward the major may be taken on a Pass/Not Pass basis except Sociology 198 or 199.* Only *one* such special studies course (including internships) may be applied toward the major. These special studies courses must be applied for and approved by the department be-

fore the beginning of the quarter in which the student wishes to enroll, and can only be taken on a Pass/Not Pass basis. See the staff undergraduate adviser for the necessary application forms and deadlines.

### Lower Division

Sociology 1A, 1B, 20, and Social Science 60 (Elementary Statistics for the Social Sciences) are required for the major. We strongly recommend that you take Sociology 1A and Sociology 1B in sequence. It is advisable that students complete these required lower-division courses (which should be taken during the freshman or sophomore year) before continuing with their upper-division work. If you declared your major prior to fall 1990, Sociology 10, 30, or 40 may be used to satisfy the third lower-division sociology course requirement for the major. If you did not declare your major until fall 1990, you are required to take Sociology 20, Social Change in the Modern World, to fulfill your lower-division requirements.

### Upper Division

Twelve upper-division courses are necessary for the major—six are courses in required areas, and the other six are upper-division electives. The upper-division sociology curriculum is divided into four areas of concentration (clusters) as follows:

1. **Theory and Method** (courses designated Soc/A)  
Theory  
100, 101, 101M, 102, 102T, 103F, 103T  
Methods  
103M, 104, 105, 106, 107, 107D, 108A, 108B, 109, 109S, 120
2. **Culture, Language, and Social Interaction** (courses designated Soc/B)  
111, 112, 113, 114, 115, 116, 117, 118, 120S, 131, 137, 142, 143, 160, 161, 162, 164J, 166, 167, 170, 172, 173, 174, 176, 178
3. **Organizations and Institutions** (courses designated Soc/C)  
121, 122, 123, 124, 125, 126, 129, 130, 135, 136A, 136B, 140, 141, 144, 148, 148C, 148E, 148I, 149, 150, 150L, 151M, 156, 157, 159, 165A/B, 168E, 168J, 168S, 180
4. **Comparative and Historical** (courses designated Soc/D)  
120W, 133, 151, 158, 158J, 179, 181, 181I, 182, 183S, 184, 185, 186P, 187, 188A, 188B, 188D, 188E, 188F, 188G, 188H, 188I, 188J, 189

All students must complete Sociology 100. (Students are *strongly* advised to take Sociology 100 in their junior year.) In addition, *two* other

courses are required from the **Theory and Method** cluster (Soc. 101 to 109), at least one of which must be in methods. *One* course is required in each of the other three areas. Students are encouraged to complete their theory and methods courses early in their program, since theoretical perspectives and skills in methods will enhance their subsequent course work.

In fulfilling the major, students may apply, with the Department of Sociology approval, up to two upper-division courses from the relevant offerings in the Departments of Anthropology, Economics, History, Linguistics, Political Science, Psychology, Urban Studies and Planning, macro and micro areas of the Department of Communication, and the Teacher Education Program. Courses from departments other than these may be taken if the student submits a petition to, and obtains approval from, the Department of Sociology.

### Writing Requirement

Writing skills, including the ability to define precise questions, marshal evidence, and present clear arguments, are indispensable for all students, whatever their academic and career interests. To help students develop these skills, the department asks all new (fall 1991 or later) majors to fulfill a writing requirement. Before graduating, students must show the undergraduate coordinator (in the Main Office) three substantial (ten or more pages) research papers written for courses in their major, for which they received a grade of C — or better. Ideally, this should take place the quarter before graduation when students come to the undergraduate coordinator to make certain they have met all major requirements. The three papers should be brought in at the same time. To give students ample opportunity to complete this requirement, most upper-division sociology classes will either assign a research paper or offer students the option of writing such a paper for course credit.

### RECOMMENDATIONS FOR TRANSFER STUDENTS

If students wish to use courses taken at other institutions towards their major, they must first meet with the staff undergraduate adviser in the department during designated office hours. (College transcripts, college catalogs, and course syllabi should be brought at the time of appointment.) Students are required to fill out one student petition *per* transfer course as well as an additional "information sheet" available in the Department of Sociology. Once these petitions are turned in, a determination will be made regarding the transferring of courses into the program.



It is important to note that eight of the twelve upper-division courses in the undergraduate program must be taken in the Department of Sociology at UCSD, unless students obtain special acceptance of additional courses from the chair and the faculty undergraduate adviser.

### **THE MINOR**

The minor consists of six sociology courses: two lower-division and four upper-division. Unless colleges specify specific courses to be taken, the student may choose any two lower-division sociology courses (Soc. 1A, 1B, 10, 20, or 40) and any four upper-division courses (Soc. 100 to 190). Courses for the minor must be taken for a *letter grade only*. Special study courses or internships may not be applied toward the minor.

### **THE HONORS PROGRAM**

The Department of Sociology offers an Honors Program to those students who have demonstrated excellence in the sociology major. Successful completion of the Honors Program enables the student to graduate "With Highest Distinction," "With High Distinction," or "With Distinction," depending upon performance in the program.

### **Eligibility**

1. Junior standing (ninety units completed).
2. GPA of 3.5 or better in the major.
3. Recommendation of a faculty sponsor familiar with student's work.
4. Must have completed at least four upper-division sociology courses.
5. Overall GPA of 3.2 or better.
6. Interested students may pick up an application from the staff undergraduate adviser in the Department of Sociology. Completed applications must be in the department office no later than June 1.

### **Course Requirement**

The student must take Sociology 196A, Advanced Studies in Sociology, and Sociology 196B, Supervised Thesis Research, which will count as two of the twelve upper-division courses required for the major. Each student will choose a faculty adviser to help supervise the thesis research and writing with the Honors Program director.

Students whose GPA in the major falls below 3.5 or who do not earn at least an A- in the Honors Seminars will not graduate with distinction, but they may count the two honors courses among the twelve upper-division courses required for the major. Students must maintain a

3.5 GPA in the major and a 3.2 overall GPA until final graduation, in order to receive Honors in the Sociology Honors Program. To graduate "With Highest Distinction" the student must earn an A+; to graduate "With High Distinction" the student must earn an A; and to graduate "With Distinction" the grade must be an A-.

### **THE GRADUATE PROGRAM**

The Department of Sociology offers a course of study leading to the doctor of philosophy degree. The department is predominantly qualitative and concentrates on three main areas:

#### **1. Comparative and Historical Sociology.**

Faculty members have done research on India, Japan, China, Spain, Hungary, Britain, pre- and post-revolutionary Russia, the Middle East, and several Latin American countries. Substantive topics have included socioeconomic and sexual stratification, class structure, theories of development, the relationships of ideology to social change, economic organization, the origins of the modern penal system, comparative social movements, and the methodology of comparative historical research.

**2. Sociology of Culture** (both mass culture and high culture). Our faculty study cultural systems in Europe, the Middle East, the United States, Central and South America, Eastern Europe, Japan, China, and Africa. The department offers courses in popular culture, mass media, ethnographic films, and the sociology of the arts, literature, film, and intellectual life.

**3. Interactional Sociology.** The department offers courses on symbolic interaction, sociolinguistics, cognitive sociology, ethnomethodology, and the sociology of everyday life.

The goal of the program is to prepare students who will advance the discipline of sociology through creative research and scholarship. Students interested in an interdisciplinary Ph.D., with a concentration in sociology, can refer to the Program in Comparative Studies in Language, Society, and Culture.

### **ADMISSION**

New students are admitted in the fall quarter of each academic year. Prospective applicants should submit the official application for admission and awards (same form), one set of official transcripts from each institution attended after high school, official scores from the Graduate Record Examination, application fee, at least three letters of recommendation, and one or more samples of the applicant's own writing, such as term papers. Additionally, foreign applicants must submit official scores from the Test of English as

a Foreign Language (TOEFL) and a confidential financial statement. Applicants are encouraged to visit the department to talk with faculty and graduate students. The application deadline is 15 January.

### **PROGRAM OF STUDY**

Programs of study are determined in consultation with the graduate adviser, who supervises the work of students until their doctoral committees have been established. During the first year of study students have little time for individual variation because the first three quarters are spent fulfilling the basic requirements of the core curriculum. Thereafter, students have more freedom of choice.

Graduate students who have received either a master's degree or its equivalent from other universities may petition to omit core curriculum courses that appear to repeat work they already have completed successfully. Generally petitions requesting course exemptions are submitted after the student has arrived on campus.

### **THE CORE CURRICULUM SEQUENCE**

The "core curriculum" is a group of courses covering the history of sociological theory and styles of sociological analysis. The core curriculum is designed to introduce graduate students to some of the major issues in sociological theory and method.

In addition to courses in classical sociological theory and styles of sociological analysis, the first-year cohort takes "Orientation to Faculty." The faculty orientation course introduces different faculty members to the first-year students.

### **ASSESSMENT OF STUDENTS IN THE FIRST YEAR OF THE PROGRAM**

A committee composed primarily of the core curriculum faculty will evaluate first-year students on the basis of their performance in their first-year core curriculum courses. Results of the evaluations will be communicated to students in writing. The committee will either establish the student is in good standing, recommend additional course work, or recommend dismissal. In addition, the committee may wish to meet with some students in person to discuss the evaluation.

### **REQUIREMENTS FOR THE ORAL QUALIFYING EXAMINATION**

Students spend the second year broadening their knowledge of different fields of interest and

exploring ideas for their dissertations. Prior to the oral qualifying exams students are required to take six substantive seminars, at least four of which must be taken for a letter grade. With the approval of the graduate adviser, one of these may be in a related discipline. It is also recommended that students take courses outside the department in order to broaden their knowledge of fields related to sociology.

Upon completion of the core curriculum, the six elective seminars, and the submission of three qualifying papers, students will be eligible to take the qualifying examination, which will cover three fields of research. These three fields, to be selected by the student, should be 1) broad, 2) distinct, and 3) generally recognized sub-disciplines in sociology. Mastery of the fields should equip the student to teach three upper-division courses in sociology. The fields selected by the student must be approved by the chair of the department.

For the study of each field, the student will prepare a reading list, which must be approved by the sociology faculty members of the student's committee. In general, this reading list will consist of about twenty-five books and/or articles and will include the major works in the sub-discipline. In specialized cases, e.g., the fields of statistics, the list can be shorter.

For each of the three fields, the student should write a paper, whose length will vary depending on the field. Twenty-five pages is a suggested guideline. The papers should show a command of the major concepts, debates, and concerns in each of the three fields. The typical paper will be a review of the literature, but it could also be a substantive paper displaying a broad knowledge of the field. One of the three papers should demonstrate methodological competence, either in practice or through a critical discussion of the methodological literature.

Faculty members conducting the orals examinations will be chosen according to procedures determined by university policy and by departmental resolutions. In general these faculty members will also guide the student through his or her doctoral dissertation. For this reason, faculty members conducting the oral exams are formally known as the doctoral committee. The makeup of this committee is described below.

According to university policy, the doctoral committee consists of at least five members; three of these are from the sociology department, the remainder from another department or departments. At least one of the members from another department must be tenured. Four of the five faculty members must hold professorial titles of any rank (the fifth member may be a lecturer with security of employment, etc.). One of the five may

be from another University of California campus but the chair of the committee must be from the UCSD Department of Sociology. Another committee member may serve as co-chair. A sixth voting member of the committee may be drawn from other UCSD faculty, faculty in other universities, or nonacademic with relevant interests and expertise. The student will choose three members of the department and two outsiders for the doctoral committee. The outside members should be faculty whose areas of expertise are those most congruent with the student's sociological interests. The composition of the doctoral committee must be approved by the chair of the Department of Sociology and the dean of the Office of Graduate Studies and Research.

### **ORAL QUALIFYING EXAMINATION**

The oral qualifying examination will be conducted by the student's doctoral committee. The aims of the examination are to test the student's knowledge of three areas of specialization, and his or her readiness to undertake further work on the tentative dissertation prospectus. Each of the examining faculty may ask questions in any of the three areas presented by the student; these questions may address fundamental issues in the field, even if these are not covered directly in the student's paper on the field. The department expects students to pass the oral qualifying examinations no later than the end of the fourth year of graduate study. The performance of those students who fail to do so will be reviewed by the committee on graduate students, which will set a deadline by which the examination must be completed if the student is to remain in the program. After passing the qualifying examination, the student is eligible to receive a candidate in philosophy degree and a master of arts degree.

### **DISSERTATION PROSPECTUS**

Within a year of passing the orals qualifying exams, the student must have a dissertation prospectus approved by his or her committee. This prospectus must contain a description of the proposed research project, a justification of its significance and feasibility, and a discussion of the research methods that will be used. The doctoral committee will place in the student's file a written evaluation of the significance, originality, and feasibility of the proposed project.

### **DISSERTATION RESEARCH AND PREPARATION**

The nature and requirements of dissertation research vary greatly depending upon the spe-

cific problem chosen. Once the student's doctoral committee has approved the dissertation prospectus the student is ready to begin research and writing. At least one of the orals papers should become part of the dissertation, possibly even an entire chapter. Throughout the research and writing phase of the student's graduate career he or she should consult frequently with the committee. When the dissertation is substantially completed copies are distributed to the committee four to six weeks prior to the proposed defense date. After reading the draft the committee meets without the student to discuss it, then notice is given to the student of any changes required. The actual dissertation defense takes place at least one month after the preliminary meeting, after any changes are made. The final dissertation must be approved by each member of the doctoral committee and filed with the university librarian. Acceptance of the dissertation by the librarian represents the final step in completing all the requirements for a doctor of philosophy degree.

### **DEPARTMENTAL PH.D. TIME LIMIT POLICIES**

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed seven years. Total registered time at UCSD cannot exceed eight years.

### **GRADUATE PROGRAM IN SCIENCE STUDIES**

The graduate Program in Science Studies is an interdisciplinary doctoral program offered collaboratively by the Departments of Sociology, History, and Philosophy. The program is designed to introduce students to historical, sociological, and philosophical approaches to the understanding of scientific knowledge, and to encourage them to explore the ways in which various traditions arising from those three disciplines might be integrated into a single framework for understanding the scientific enterprise past and present. The core of the program is a weekly seminar, led by faculty from all three departments, in which both classic and recent works in the science studies disciplines will be analyzed and discussed, and in which faculty and students may also present their current work for discussion and criticism. Students will also have to take graduate seminars in all three disciplines.

For more information on the Program in Science Studies, see the coordinator in the Science Studies Office, H&SS 7023.

## Courses

### LOWER DIVISION

#### Soc/L 1A. The Study of Society (4)

An introduction to the organizing themes and ideas, empirical concerns, and analytical approaches of the discipline of sociology. The course focuses on both classical and contemporary views of modern society, on the nature of community, and on inequality, with special attention to class, race, and gender. Materials include both theoretical statements and case studies. (This is a required course for the sociology major.)

#### Soc/L 1B. The Study of Society (4)

A continuation of Sociology/L 1A. The focus here is on socialization processes, culture, social reproduction and social control, and collective action. As in 1A, materials include both theoretical statements and case studies. While 1B may be taken as an independent course, it is recommended that students take 1A and 1B in sequence, as the latter builds on the former. (This is a required course for the sociology major.)

#### Soc/L 10. American Society: Social Structure and Culture in the United States (4)

An introduction to American society in historical, comparative, and contemporary perspectives. Topics will include American cultural traditions; industrialization; class structure; the welfare state; ethnic, racial, and gender relations; the changing position of religion; social movements; and political trends.

#### Soc/L 20. Social Change in the Modern World (4)

A survey of the major economic, political, and social forces that have shaped the contemporary world. The course will provide an introduction to theories of social change, as well as prepare the student for upper-division work in comparative-historical sociology. (This is a required course for the sociology major.)

#### Soc/L 40. Sociology of Health Care Issues (4)

Designed as a broad introduction to medicine as a social institution and its relationship to other institutions as well as its relation to society. It will make use of both micro and macro sociological work in this area and introduce students to sociological perspectives of contemporary health care issues.

#### Soc/L 90. Undergraduate Seminar (1)

This seminar will focus on a variety of current issues and special areas in the field of sociology, and will be focussed in particular on students of freshman status. Content will vary from year to year. (P/NP grades only.) Prerequisite: freshman status.

### ■ CLUSTER A: THEORY AND METHODS

#### Theory

#### Soc/A 100. Classical Sociological Theory (4)

Major figures and schools in sociology from the early nineteenth century onwards, including Marx, Tocqueville, Durkheim, and Weber. The objective of the course is to provide students with a background in classical social theory, and to show its relevance to contemporary sociology. Prerequisite: upper-division standing. (This is a required course for the sociology major.)

#### Soc/A 101. Advanced General Sociology (4)

A critical examination of basic concepts of sociology—social organization, culture, structure, stratification, etc., in their relation to selected problems of analysis and research. Prerequisite: upper-division standing. Will satisfy theory requirement in Cluster A.

#### Soc/A 101M. Marxism (4)

This course examines the writings of Marx and Engels and developments in Marxist theory since Marx (e.g., Lenin and

Gramsci). It will consider philosophical presuppositions and historical contexts as well as a variety of issues in political, social and economic theory. Prerequisite: upper-division standing. Will satisfy theory requirement in Cluster A.

#### Soc/A 102. Contemporary Sociological Theory (4)

An analysis of leading theories in sociology with an emphasis on contemporary perspectives. Theoretical approaches include functionalism, Marxism, systems analysis, and interpretive sociology. Prerequisites: upper-division standing. Will satisfy theory requirement in Cluster A.

#### Soc/A 102T. Introduction to the Sociology of Time (4)

The relevance of time in sociology, styles of interpreting topics such as collective memory, nostalgia, and the subjective structure of utopian ideologies; also a comparative introduction to different theories and traditions of spatio-temporal awareness in world civilizations. Prerequisite: upper-division standing. Will satisfy theory requirement in Cluster A.

#### Soc/A 103F. Feminist Criticism and Social Theory (4)

This course will examine recent contributions to social theory from feminist critics and scholars. Theoretical writings will be paired with empirical studies illustrating the development and application of these ideas. The central concern of these investigations will be to reconcile new theories of subjectivity and multiple social worlds with classical understandings of society as a coherent body of practices. Prerequisite: upper-division standing. Will satisfy theory requirement in Cluster A.

#### Soc/A 103T. Special Topics in Theory (4)

Readings and discussion of particular theoretical issues in sociology. Topics will vary from year to year, depending on the current research of regular faculty or visiting faculty. Issues may include the study of a specific problem in social theory; the analysis of a particular theorist or school. Prerequisite: upper-division standing. Will satisfy theory requirement in Cluster A.

#### Soc/A 120. Mind, Self, and Society (4)

Freud's theory and its implications for the study of society. The first part of the course will focus on Freud's own theoretical project, examining first his theory of the mind; then his more comprehensive theory of personality and personality development; then his ventures into the analysis of culture, politics, and society. The second part will move on to consider the broader significance of his theory for understanding human nature and the social order; it may take into account subsequent developments in psychoanalysis, attempts by other thinkers to use and develop Freud's developments in psychoanalysis, attempts by other thinkers to use and develop Freud's ideas, alternative approaches, etc. Prerequisite: upper-division standing. Will satisfy theory requirement in Cluster A.

#### Methods

#### Soc/A 103M. Computer Applications to Data Management in Sociology (4)

The course aim is development of student skills in computer management and analysis of sociological data. This is pursued through practical experience with data produced by sociologically directed research. Students will be expected to develop competency in the analysis of such data sets, primarily by developing an extensive acquaintance with the MINI-TAB or SPSS-X statistical and data management language. Prerequisite: upper-division standing. Will satisfy method requirement in Cluster A.

#### Soc/A 104. Field Research: Methods of Participant-Observation (4)

A basic course on the relations between sociological theory and field research. There is a strong emphasis on the theory and methods of participant observation, including a consideration of the problems of entry into field settings, recording observations, description and analysis of field data, and ethical problems in field work. Students will write a paper using these

field methods. Prerequisite: upper-division standing. Will satisfy method requirement in Cluster A.

#### Soc/A 105. Ethnographic Film (6.0)

Ethnographic recording of field data in written and audiovisual formats. Critical assessment of ethnographies in terms of styles, format, and approaches. Midterm paper and final ethnographic videotape. Prerequisite: Soc/L 1A, 1B, or consent of instructor. Will satisfy method requirement in Cluster A.

#### Soc/A 106. Comparative and Historical Methods (4)

A broad-based consideration of the use of historical materials in sociological analysis, especially as this facilitates empirically oriented studies across different societies and through time, and their application in student research projects. Prerequisite: upper-division standing. Will satisfy method requirement in Cluster A.

#### Soc/A 107. Demographic Methods (4)

This course will teach students 1) how to measure and analyze mortality, fertility, and migration rates; 2) how these rates vary by sex, race, age, and marital status, etc.; and 3) some possible social explanations for these variations. Prerequisite: upper-division standing. Will satisfy method requirement in Cluster A.

#### Soc/A 107D. Historical Demography (4)

This course introduces students to various techniques used in historical demography and to the main debate in the field, the demographic transition in the West. There will be weekly assignments and relevant articles will be debated. Prerequisite: upper-division standing. Will satisfy method requirement in Cluster A.

#### Soc/A 108A. Survey Research Design (4)

This course covers the translation of research goals into a research design, including probability sampling, questionnaire construction, data collection (including interviewing techniques), data processing, coding, and preliminary tabulation of data. Statistical methods of analysis will be limited primarily to percentaging. Prerequisite: upper-division standing. Will satisfy method requirement in Cluster A.

#### Soc/A 108B. Quantitative Analysis of Survey Data (4)

This course examines the quantitative analysis of survey research data through computer-based student participation in the research process. Emphasis will be placed on index and scale construction and on univariate, bivariate, and multivariate types of analysis, including some standard descriptive and inferential statistics. Prerequisite: upper-division standing. Will satisfy method requirement in Cluster A.

#### Soc/A 109. Statistical Analysis of Sociological Data (4)

This course covers statistical inference, measures of association, sampling theory, and linear regression. The course also introduces students to the computer skills necessary for statistical analysis. Prerequisite: Social Science 60 or consent of instructor. Will satisfy method requirement in Cluster A.

#### Soc/A 109S. Special Topics in Methods (4)

Readings and discussions of particular methodological issues in sociology. Topics will vary from year to year, depending on the current research of regular faculty or visiting faculty. Prerequisite: upper-division standing. Will satisfy method requirement in Cluster A.

### ■ CLUSTER B: CULTURE, LANGUAGE, AND SOCIAL INTERACTION

#### Soc/B 111. Individual and Society (4)

This course will cover the classic confrontation between the individual and the society, and its recent compression into social psychology. We will explore the historical change in this relation through the writings of nineteenth-century social philosophers, twentieth-century psychologists and sociologists, and several literary figures. Prerequisite: upper-division standing.

**Soc/B 112. Social Psychology (4)**

This course will deal with human behavior and personality development as affected by social group life. Major theories will be compared. The interaction dynamics of such substantive areas as socialization, normative and deviant behavior, learning and achievement, the social construction of the self, and the social identities will be considered. *Prerequisite: upper-division standing.*

**Soc/B 113. Sociology of Interaction and Everyday Life (4)**

This course will attempt to construct a science out of everyday life by examining its recurrent features. We will focus particularly on the vicissitudes of the individual's self, the subtleties of interpersonal interaction, and the group experiences of multiple realities. *Prerequisite: upper-division standing.*

**Soc/B 114. Social Psychology of Close Personal Relationships (4)**

Theories of social psychology will be applied to close personal relationships—friendships, love, family, work, and team. Idiosyncratic and generic features will be discussed. The part emotions play in relationships, problems of "balancing" relationship responsibilities, and their career over the life span will be covered. *Prerequisite: upper-division standing.*

**Soc/B 115. Introduction to Sociolinguistics (4)**

Investigation of the fundamental relations between the forms of language and other aspects of human social order. Special emphasis is given to the interaction between selected modes of language investigations and theories of social cognition and behavior. *Prerequisite: upper-division standing.*

**Soc/B 116. The Discourse of the Cold War (4)**

This course focuses on the ways of speaking, acting and thinking about the role of nuclear weapons in the relations between the U.S., the USSR, and their allies since the end of WWII (the "Cold War"). The characteristics of strategic discourse are described and compared to other technical expert discourse. The discourse strategies of challenges to the strategic position and the various responses which those challenges have engendered are analyzed. *Prerequisite: upper-division standing.*

**Soc/B 117. Language, Culture, and Education (4)**

(Same as TEP 117.) The mutual influence of language, culture, and education will be explored; explanations of students' school successes and failures that employ linguistic and cultural variables will be considered; bilingualism; cultural transmission through education. *Prerequisite: upper-division standing.*

**Soc/B 118. Sociology of Sex and Gender Roles (4)**

An analysis of the social, biological, and psychological components of becoming a man or a woman. The course will survey a wide range of information in an attempt to specify what is distinctively social about gender roles and identities; i.e., to understand how a most basic part of the "self"—womanhood or manhood—is socially defined and socially learned behavior. *Prerequisite: upper-division standing.*

**Soc/B 120S. Special Topics in Culture, Language, and Social Interaction (4)**

This course will examine key issues in culture, language, and social interaction. Content will vary from year to year. *Prerequisite: upper-division standing.*

**Soc/B 131. Sociology of Youth (4)**

Chronological age and social status; analysis of social processes bearing upon the socialization of children and adolescents. The emergence of "youth cultures," generational succession as a cultural problem. *Prerequisite: upper-division standing.*

**Soc/B 137. Alcohol and Society (4)**

The purpose of this course is to give the student an overview of the multitude of problems and the complex issues connected with the manufacture, sale, and consumption of alcohol. The

course will be divided into three parts: 1) the positive and negative physiological, psychological, and social effects of alcohol consumption; theories of alcoholism causation; 2) microsociology of alcoholism—interaction of alcoholics with relatives, friends, treatment professionals; 3) macro-sociology of alcohol (manufacture, sale, consumption)—effects on society of alcoholism, the development of alcohol policies and their assessment. *Prerequisite: upper-division standing.*

**Soc/B 142. Social Deviance (4)**

This course studies the major forms of behavior seen as rule violations by large segments of our society and analyzes the major theories trying to explain them, as well as processes of rule making, rule enforcing, techniques of neutralization, stigmatization and status degradation, and rule change. *Prerequisite: upper-division standing.*

**Soc/B 143. Suicide (4)**

Traditional and modern theories of suicide will be reviewed and tested. The study of suicide will be treated as one method for investigating the influence of society on the individual. *Prerequisite: upper-division standing.*

**Soc/B 160. Sociology of Culture (4)**

This course will examine the concept of culture, its "dis-integration" in the twentieth century, and the repercussions on the integration of the individual. We will look at this process from a variety of perspectives, each focusing on one cultural fragment (e.g., knowledge, literature, religion) and all suggesting various means to reunify culture and consequently the individual. *Prerequisite: upper-division standing.*

**Soc/B 161. Sociology of Leisure (4)**

An historical and comparative analysis of conceptions of leisure, and their applicability at varying levels of social stratification. The course will also examine leisure patterns and social change. *Prerequisite: upper-division standing.*

**Soc/B 162. Popular Culture (4)**

(Same as Com/Cul 162.) An overview of the historical development of popular culture from the early modern period to the present. Also a review of major theories explaining how popular culture reflects and/or affects patterns of social behavior. *Prerequisite: Com/Gen 20 or Soc/L 1A or consent of instructor.*

**Soc/B 164J. Persuasion and Society (4)**

(Same as Com/Cul 174.) What is the role of messages intentionally designed to be persuasive in society? How are these messages crafted and what impact do they have? Topics will vary, but will typically include commercial advertising, public information campaigns, propaganda, public relations, and schooling. The course integrates research from sociology, social psychology, rhetoric, and communication. *Prerequisite: upper-division standing or consent of instructor.*

**Soc/B 166. Sociology of Knowledge (4)**

This course provides a general introduction to the development of the sociology of knowledge, and will explore questions concerning social determination of consciousness as well as theoretical ways to articulate a critique of ideology. *Prerequisite: upper-division standing.*

**Soc/B 167. Intellectuals and Society (4)**

Sociological analysis of the intelligentsia: types of intellectual theories concerning their social role; research on the social sources of intellectual work in politics, literature, art, and science; historical considerations of intellectual milieu; international comparisons of intellectuals. *Prerequisite: upper-division standing.*

**Soc/B 170. Sociology of Fashion (4)**

A sociological and historical inquiry into the role of fashion in Western civilization and contemporary America. Alternative sociological and social psychological theories of fashion will be presented with particular attention given to the cultural resources and psychological dispositions which help sustain the

fashion impulse among modern peoples. *Prerequisite: upper-division standing.*

**Soc/B 172. Films and Society (4)**

An analysis of films and how they portray various aspects of American society and culture. *Prerequisite: upper-division standing.*

**Soc/B 173. Visual Knowledge (4)**

This course reviews ways that visual imagery contributes to our understanding of the world around us and ourselves. Students will consider uses of visual images in science, the mass media, and everyday life. *Prerequisite: Soc/L 1A or consent of instructor, or Com/Gen 20.*

**Soc/B 174. Sociology of Literature (4)**

Literature will be discussed in the context of the ideas of national and regional culture, "historical situations" and "social order." Other issues to be studied are literary men and women as spokespersons and as rebels, literary movements and social conditions, and literary works as social documents. *Prerequisite: upper-division standing.*

**Soc/B 176. Material Culture: Design and Social Process (4)**

(Same as Com/Cul 161.) An investigation of the connections between material culture and the technical and social forces affecting its production and use. Analytic topics include dress, gardening, and urban planning. *Prerequisite: upper-division standing.*

**Soc/B 178. Special Topics in the Culture, Language, and Social Interaction (4)**

This course will treat themes that cross-cut the customary subdivision of the sociology of culture. It will consist of readings and discussions of particular theoretical, substantive, and research problems in this field. Topics will vary from year to year. *Prerequisite: upper-division standing.*

**■ CLUSTER C: SOCIAL ORGANIZATION AND INSTITUTIONS**

**Soc/C 121. Economy and Society (4)**

An examination of a central concern of classical social theory; the relationship between economy and society, with special attention (theoretically and empirically) on the problem of the origins of modern capitalism. The course will investigate the role of technology and economic institutions in society; the influence of culture and politics on economic exchange, production, and consumption; the process of rationalization and the social division of labor; contemporary economic problems and the welfare state. *Prerequisite: upper-division standing.*

**Soc/C 122. Sociology of Organization (4)**

This course examines the fundamental traits of modern organizations. Both formal and informal organizational structures are examined, with special emphasis on their macro-structural determinants as well as the behavior of people within those structures. *Prerequisite: upper-division standing.*

**Soc/C 123. Sociology of Work (4)**

A comparative analysis of work in contemporary industrial economies. Topics include: the division of labor in manufacturing and the changing structure of the working class, social and political consequences of skill and wage differentials, bureaucratization and determinants of job satisfaction, trade unions and their strategies, industrial conflict, labor movements, and the relationships between unions and political parties. *Prerequisite: upper-division standing.*

**Soc/C 124. Occupations and Professions (4)**

Analysis of the social organization of work in modern societies, the concept of career, the development of professionalization. Occupational subcultures; work, leisure and alienation; social relationships of work groups in organizations; human relations in work situations; professional and occupational associations.



Prospects for the humanization of work: democratization, derationalization, deprofessionalization. Change and conflict in contemporary occupations and professions. *Prerequisite: upper-division standing.*

**Soc/C 125. Minorities in the Schooling Process (4)**  
Using a survey format, the course will examine and critique various themes, principles, theories, and research concerning ethnic minorities in public education. The focus will be on Mexican-origin and African-American students in public schools, grades K-12. *Prerequisite: upper-division standing.*

**Soc/C 126. Social Organization of Education (4)**  
(Same as TEP 126.) The social organization of education in the U.S. and other societies; the functions of education for individuals and society; the structure of schools; educational decision making; educational testing; socialization and education; formal and informal education; cultural transmission. *Prerequisite: upper-division standing.*

**Soc/C 129. The Family (4)**  
An examination of the family as an institution in modern and premodern societies. This course will begin with a study of the principles of kinship and then investigate the relationship of the family to social structure and social change. *Prerequisite: upper-division standing.*

**Soc/C 130. Families and Communities in American Society: Cross-Cultural Forms (4)**  
A cross-ethnic examination of families currently living in enclaves and integrated communities in the United States. Emphasis placed on the contemporary strategies utilized by families and communities to cope with familial responsibilities, economic constraints, and societal pressures. *Prerequisite: upper-division standing.*

**Soc/C 135. Medical Sociology (4)**  
A selective inquiry into the roles of culture, social structure, and organized health professions for defining, mediating, and structuring the health and illness experiences of key social groups in American society. *Prerequisite: upper-division standing.*

**Soc/C 136A. Sociology of Mental Illness: An Historical Approach (4)**  
An examination of the social, cultural, and political factors involved in the identification and treatment of mental illness. This course will emphasize historical material, focusing on the eighteenth, nineteenth, and early twentieth centuries. Developments in England as well as the United States will be examined from an historical perspective. *Prerequisite: upper-division standing.*

**Soc/C 136B. Sociology of Mental Illness in Contemporary Society (4)**  
This course will focus on recent developments in the mental illness sector and on the contemporary sociological literature on mental illness. Developments in England as well as the United States will be examined. *Prerequisite: upper-division standing.*

**Soc/C 140. Sociology of Law (4)**  
This course analyzes the functions of law in society, the social sources of legal change, social conditions affecting the administration of justice, and the role of social science in jurisprudence. *Prerequisite: upper-division standing.*

**Soc/C 141. Crime and Society (4)**  
A study of the social origins of criminal law, the administration of justice, causes and patterns of criminal behavior, and the prevention and control of crime, including individual rehabilitation and institutional change, and the politics of legal, police, and correctional reform. *Prerequisite: upper-division standing.*

**Soc/C 144. Forms of Social Control (4)**  
The organization, development, and mission of social control agencies in the nineteenth and twentieth centuries, with em-

phasis on crime and madness; agency occupations (police, psychiatrists, correctional work, etc.); theories of control movements. *Prerequisite: upper-division standing.*

**Soc/C 148. Political Sociology (4)**  
Course focuses on the interaction between state and society. It discusses central concepts of political sociology (social cleavages, mobilization, the state, legitimacy), institutional characteristics, causes, and consequences of contemporary political regimes (liberal democracies, authoritarianism, communism), and processes of political change. *Prerequisite: upper-division standing.*

**Soc/C 148C. Power, Culture, and Social Revolt (4)**  
This course will focus on the problem of how power is meaningfully constructed and contended by examining cases of social revolt and everyday resistance. Clarifying the concepts of hegemony and ideology will be a central concern of the course. *Prerequisite: upper-division standing.*

**Soc/C 148E. Ethnicity, Nationalism, and Politics (4)**  
The sources and evolution of romantic nationalism, great power nationalism, fascism, national liberation, ethnic pride, and religious fundamentalist movements. We will focus on the recent upsurge of nationalist movements in the Soviet Union, Eastern Europe, the Middle East, but also in developed Western societies. *Prerequisite: upper-division standing.*

**Soc/C 148I. Collective Identity and Group Formation (4)**  
Examines the genesis and transformation of collective identities, with particular emphasis on ethnicity. Topics include the political economy of group formation and classification, the relationship between culture and identity, and between identity and collective action. *Prerequisite: upper-division standing.*

**Soc/C 149. Theory of Social Problems (4)**  
Structure and process by which situations become public issues; analysis of movements to criminalize or decriminalize, such as abortion, homosexuality, alcohol consumption, gambling, pornography, prostitution. Development of conflict and consensus of public issues; shifts between public and private problems. *Prerequisites: Soc/L 1A and 1B.*

**Soc/C 150. Equality and Inequality (4)**  
Equality and elitism as persistent issues in modern societies. Materials from philosophy, history, and social sciences are used to define and describe current arguments and existing patterns of political power, popular and high culture, educational equality, and the distribution of income. *Prerequisite: upper-division standing.*

**Soc/C 150L. The Politics of Language and Ethnicity (4)**  
This course examines language politics and ethnolinguistic conflicts from a comparative, sociolinguistic perspective. It considers the nature of language variation, of ethnicity, and of political action in case studies from North America, Europe, Asia, Africa, and/or Latin America. *Prerequisite: upper-division standing.*

**Soc/C 151M. Chicanos in American Society (4)**  
Survey of contemporary sociological issues affecting Mexican-origin people in the United States. Lectures and reading will be oriented toward providing a greater understanding of how key institutions in society allocate opportunities and institutional resources to different social groups. *Prerequisite: upper-division standing.*

**Soc/C 156. Sociology of Religion (4)**  
Diverse sociological explanations of religious ideas and religious behavior. The social consequences of different kinds of religious beliefs and religious organizations. The influence of religion upon concepts of history, the natural world, human nature, and the social order. The significance of such notions as "sacred peoples" and "sacred places." The religious-like character of certain political movements and certain sociocultural attitudes. *Prerequisite: upper-division standing.*

**Soc/C 157. Religion in Contemporary Society (4)**  
Sacred texts, religious experiences, and ritual settings are explored from the perspective of sociological analysis. The types and dynamic of religious sects and institutions are examined. African and contemporary U.S. religious data provide resources for lecture and comparative analysis. *Prerequisite: upper-division standing.*

**Soc/C 159. Special Topics in Social Organizations and Institutions (4)**  
Readings and discussion of particular substantive issues and research in the sociology of organizations and institutions—including such areas as population, economy, education, family, medicine, law, politics, and religion. Topics will vary from year to year. *Prerequisite: upper-division standing.*

**Soc/C 165A-B. American News Media (4-4)**  
(Same as Comm/SF 171 A-B; Poli. Sci. 1021 A-B.) History, politics, social organization, and ideology of the American news media. 165A surveys the development of the news media as an institution, from earliest newspapers to modern mass news media. 165B deals with special topics, including the nature of television news, with methods of news media research, and requires a research paper. *Prerequisite: Soc/L 1A or consent of instructor; Soc/C 165B requires Soc/C 165A.*

**Soc/C 168E. Sociology of Science (4)**  
A survey of theoretical and empirical studies concerning the workings of the scientific community and its relations with the wider society. Special attention will be given to the institutionalization of the scientific role and to the social constitution of scientific knowledge. *Prerequisite: upper-division standing.*

**Soc/C 168J. Scientific and Technological Controversies in Contemporary American Society (4)**  
The course will introduce the students to the basic tools of sociology of science and technology; how can science in action be followed? How can scientific controversies be mapped and analyzed? How can we analyze the technical artifacts we live with? *Prerequisite: upper-division standing.*

**Soc/C 168S. The Making of the Scientist (4)**  
A social, historical, and sociological survey of the development of the scientist's role from the Renaissance to the early twentieth century, assessing changing historical connections between scientists' views of nature and the status perceived value of the scientific role. *Prerequisite: upper-division standing.*

**Soc/C 180. Social Movements and Social Protest (4)**  
An examination of the nature of protests and violence, particularly as they occur in the context of larger social movements. The course will further examine those generic facets of social movements having to do with their genesis, characteristic forms of development, relationship to established political configurations, and gradual fading away. *Prerequisite: upper-division standing.*

**■ CLUSTER D: COMPARATIVE AND HISTORICAL SOCIOLOGY**

**Soc/D 120W. Gender and Development (4)**  
The purpose of this course is to examine the status of women in various parts of the world. Several cultures will be compared. Attention will be paid to the influence of cultural, sociopolitical, and economic factors on gender inequality. Women's roles in society, the community, and the family will be discussed. *Prerequisite: upper-division standing.*

**Soc/D 133. Comparative Sex Stratification (4)**  
Utilizing a new theory of factors affecting female status, we examine topics including women in evolutionary perspective. Third World women and modernization; women's changing position in the USSR, Israeli kibbutz, and especially the United States and the political economy of sex stratification. *Prerequisite: upper-division standing.*

**Soc/D 151. Comparative Race and Ethnic Relations (4)**

An historical and comparative analysis of race and ethnic relations in various national settings, with emphasis on the United States. The course will analyze the origins of ethnic stratification systems, their maintenance, the adaptation of minority communities, and the role of reform and revolutionary movements and government policies in promoting civil rights and social change. *Prerequisite: upper-division standing.*

**Soc/D 158. Islam in the Modern World (4)**

The role of Islam in the society, culture, and politics of the Muslim people during the nineteenth and twentieth centuries; attempts by Muslim thinkers to accommodate or reject rival ideologies (such as nationalism and socialism); and a critical review of the relationship between Islam and the West. *Prerequisite: upper-division standing or consent of instructor.*

**Soc/D 158J. Religion and Ethics in China and Japan (4)**

This course examines religious traditions of China and Japan. It explores the relationship between religious ideas and practices on the one hand, and issues of social and individual ethics and morality on the other. *Prerequisite: upper-division standing.*

**Soc/D 179. Social Change (4)**

Course focuses on the development of capitalism as a worldwide process, with emphasis on its social and political consequences. Topics include: precapitalist societies, the rise of capitalism in the West, and the social and political responses to its expansion elsewhere. *Prerequisite: upper-division standing.*

**Soc/D 181. Modern Western Society (4)**

This course examines the nature and dynamics of modern Western society in the context of the historical process by which this type of society has emerged over the last several centuries. The aim of the course is to help students think about what kind of society they live in, what makes it the way it is, and how it shapes their lives. *Prerequisite: upper-division standing.*

**Soc/D 181I. The Sociology of Indian-White Relations (4)**

Examines historical and contemporary relations between Native American societies and the United States. Pays particular attention to transformation in Indian collective identities, political power, and collective action, and to current political and economic issues. *Prerequisite: upper-division standing.*

**Soc/D 182. Revolutions (4)**

An historical and comparative analysis of a selected set of modern political revolutions. Review and criticism of social class interpretations of revolutions. The role of revolutions in redefining the moral terms of social life. *Prerequisite: upper-division standing.*

**Soc/D 183S. Post-Communist Societies (4)**

Theories of social transformation will be applied to the fundamental changes taking place in eastern Europe, the Soviet Union, China, and socialist countries in the Third World. Through comparing different countries, the course will discuss the causes and consequences of social, economic, and political change. *Prerequisite: upper-division standing.*

**Soc/D 184. Societal Evolution and Economic Development (4)**

This course will examine agricultural societies at different evolutionary levels of technological and societal complexity, ranging from hunting-gathering bands with incipient agriculture to traditional agrarian empires. We shall explore the impact of change, modernization, and the world economy on contemporary rural societies, especially Third World underdeveloped areas. *Prerequisite: upper-division standing.*

**Soc/D 185. The Political Economy of Development and Underdevelopment (4)**

This course reviews theories and definitions of development, traces the Industrial Revolution in the West and Japan, and analyzes how the colonialism and world economy fostered by the

industrialist capitalist countries affected development of Third World nations. Finally, some alternate development paths pursued by underdeveloped countries are examined. *Prerequisite: upper-division standing.*

**Soc/D 186P. Peasants and Farmers in Society (4)**

Peasants are still a majority of the population in many developing areas of the world. With modernization, they have undergone processes of rapid transformation, taken part in social and national revolutions, and have become a target group in the developmental policies of state and international institutions. This course will explore conceptual issues in the economic and social characterization of the peasantry, the ways in which peasant groups are incorporated in broader societies, and some recent themes in peasant culture and political participation. *Prerequisite: upper-division standing.*

**Soc/D 187. African Societies through Film (4)**

Exploration of contemporary African urbanization and social change via film, including 1) transitional African communities, 2) social change in Africa, 3) Western vs. African filmmakers' cultural codes. Ideological and ethnographic representations, aesthetics, social relations, and market demand for African films are analyzed. *Prerequisite: upper-division standing.*

**Soc/D 188A. Community and Social Change in Africa (4)**

The process of social change in African communities, with emphasis on changing ways of seeing the world and the effects of religion and political philosophies of social change. The methods and data used in various village and community studies in Africa will be critically examined. *Prerequisite: upper-division standing.*

**Soc/D 188B. Chinese Society (4)**

The social structure of the People's Republic of China since 1949, including a consideration of social organization at various levels: the economy, the policy, the community, and kinship institutions. *Prerequisite: upper-division standing.*

**Soc/D 188D. Latin America: Society and Politics (4)**

(Conjoined with IP/Gen 476.) Course focuses on the different types of social structures and political systems in Latin America. Topics include positions in the world economy, varieties of class structure and ethnic cleavages, political regimes, mobilization and legitimacy, class alignments, reform and revolution. *Prerequisite: upper-division standing.*

**Soc/D 188E. Soviet Society (4)**

Social change in the USSR since 1917. The attempt to create the world's first socialist society will be examined through a consideration of changing patterns of culture, politics, economics, and ethnic relations. *Prerequisite: upper-division standing.*

**Soc/D 188F. Modern Jewish Societies and Israeli Society (4)**

Contradictory effects of modernization on Jewish society in Western and Eastern Europe and the plethora of Jewish responses: assimilation, fundamentalism, emigration, socialism, diaspora nationalism, etc. Zionism, one of these responses, will be examined in detail, to be followed up by an exploration of continuity between Jewish societies and Israeli society. Simultaneously, we will scrutinize the influence of the Palestinian-Israeli conflict on Israeli society, state, and identity. *Prerequisite: upper-division standing.*

**Soc/D 188G. Policemen, Businessmen, and Students: Japanese Organizational Cultures (4)**

This course examines Japanese cultural values and social relations in the context of contemporary organizations. The focus will be on the integration of individuals into organizations and on the integration of organizations into society. *Prerequisite: upper-division standing.*

**Soc/D 188H. Middle Eastern Societies (4)**

Modern Middle Eastern societies, nineteenth-century backgrounds, encounters with the West, reformism, twentieth-cen-

tury power politics and reshaping the political geography of the region, impacts of modernization on the cultural climate of these societies, and the ideological composition of recent revivalist movements. *Prerequisite: upper-division standing.*

**Soc/D 188I. Eastern European Societies (4)**

This course focuses on Eastern European societies. The topics to be covered include the transition from feudalism to capitalism, the rise of the modern state, nationalism, ethnicity, leftist and rightist revolutionary movements, and the transition to socialism. *Prerequisite: upper-division standing.*

**Soc/D 188J. Change in Modern South Africa (4)**

Why does the authoritarian racial state in South Africa remain so resilient despite the growing commitment to transform it? The course portrays racial domination as a system of powerful but unstable interests rooted in South Africa's racially repressive labor market. *Prerequisite: upper-division standing.*

**Soc/D 189. Special Topics in Comparative-Historical Sociology (4)**

Readings and discussion in selected areas of comparative and historical macro-sociology. Topics may include the analysis of a particular research problem, the study of a specific society or of cross-national institutions, and the review of different theoretical perspectives. Contents will vary from year to year. *Prerequisite: upper-division standing.*

**■ CLUSTER E: INDEPENDENT RESEARCH AND HONORS PROGRAM**

**Soc/E 190. Senior Seminar (4)**

A research seminar in special topics of interest to available staff; provides majors and minors in sociology with research experience in close cooperation with faculty. *Prerequisite: senior standing.*

**Soc/E 196A. Honors Seminar: Advanced Studies in Sociology (4)**

This seminar will permit honors students to explore advanced issues in the field of sociology. It will also provide honors students the opportunity to develop a senior thesis proposal on a topic of their choice and begin preliminary work on the honors thesis under faculty supervision. *Prerequisite: acceptance into Department of Sociology Honors Program.*

**Soc/E 196B. Honors Seminar: Supervised Thesis Research (4)**

This seminar will provide honors candidates the opportunity to complete research on and preparation of a senior honors thesis under close faculty supervision. *Prerequisite: completion of Soc/E 196A.*

**Soc/E 198. Directed Group Study (4)**

Group study of specific topics under the direction of an interested faculty member. Enrollment will be limited to a small group of students who have developed their topic and secured appropriate approval from the departmental committee on independent and group studies. These studies are to be conducted only in areas not covered in regular sociology courses. *Prerequisites: junior standing and departmental approval required.*

**Soc/E 199. Independent Study (4)**

Tutorial: individual study under the direction of an interested faculty member in an area not covered by the present course offerings. Approval must be secured from the departmental committee on independent studies. *Prerequisites: junior standing and departmental approval required.*

**GRADUATE**

**201A. Classical Sociological Theory I (4)**

A discussion of major themes in the work of Tocqueville and Marx. *Prerequisite: graduate standing in sociology.*

**201B. Classical Sociological Theory II (4)**

A discussion of major themes in the work of Weber and Durkheim. *Prerequisite: graduate standing in sociology.*

**203. Field Methods (4)**

Research will be conducted in field settings. The primary focus will be on mastering the problems and technical skills associated with the conduct of ethnographic and participant observational studies.

**204. Text and Discourse Analysis (4)**

Techniques of gathering and analyzing transcripts of naturally occurring conversations, interviews, discourse in institutional settings, public political discourse, and text of historical materials.

**205. Survey and Demographic Methods I (4)**

This course covers some of the elementary techniques used 1) to select random samples, 2) to detect statistical patterns in the sample data, and 3) to determine whether any patterns found in sample data are statistically significant. The course also stresses the benefits and drawbacks of survey and demographic data and some common ways in which these data are used incorrectly.

**206. Survey and Demographic Methods II (4)**

The course covers some of the more advanced techniques used 1) to select random samples, 2) to detect statistical patterns in the sample data, and 3) to determine whether any patterns found in sample data are statistically significant. The course also stresses the benefits and drawbacks of survey and demographic data and some common ways in which these data are used incorrectly.

**207. Comparative-Historical Methods (4)**

A broad-based consideration of the use of historical materials in sociological analysis, especially as this facilitates empirically oriented studies across different societies and through time.

**208. Orientation to Faculty (4)**

An introduction to entering graduate students to the range and variety of research and scholarly interests of the department's faculty. Through this introduction students will be better able to relate their own research interests and professional objectives to the ongoing work of faculty.

**209A-B. Sociological Analysis (4-4)**

Students are introduced to exemplary models of sociological research. Exemplars of participant observation, text and discourse analysis, and historical analysis will be the focus of attention. Issues in gathering materials, analyzing data, interpreting results, reporting findings will be discussed.

**210. Sociology of Health and Illness (4)**

A close-in examination of the effect of cultural, social structural and interactional factors in the diagnosis, treatment, and outcome of illness experiences in contemporary society. Class discussions are organized around a series of readings designed to parallel the phases of the natural history of an illness.

**212. Social Stratification (4)**

The causes and effects of social ranking in various societies. Theories of stratification; the dynamics of informal social grouping; determinants of institutional power, and the nature of struggles for power; the distribution of wealth and its causes; the dynamics of social mobility; the effects of stratification on life-styles, culture, and deviance.

**213. Popular Culture (4)**

The purpose of the course is two-fold: 1) to introduce students to a variety of theoretical perspectives on issues central to studies of popular culture, and 2) to survey disciplines outside of the field of sociology that have been contributing to the enormous intellectual growth of popular culture studies. In the first half of the course, the class will discuss a range of se-

lected readings devoted to the role of class, gender, politics, and language in popular culture. In the second half, the class will read a set of books from anthropology, literature, psychology, history, and American studies that help to illustrate the broad interdisciplinary nature of popular culture studies.

**214. Social Psychology (4)**

Emphasis in this seminar is two-fold: 1) ways in which the sociologists' approach to social psychology can be used to guide data collection and analysis in numerous areas of investigation; and 2) a critical appraisal of alternative theories of the interaction between the individual and society, as well as possible conceptual rapprochement among them.

**215. Sociology of Law (4)**

This seminar examines the legal institutions in their social context. The course will include the following topics, two of which will be studied intensively: legal reasoning and crucial legal studies; dispute resolution; courtroom processes of adjudication; police and law enforcement; deterrence studies; law as an instrument of social change; symbolic properties of law.

**216. Sociology of Culture (4)**

The history of the concept of culture; cultural pluralism in advanced industrialized societies; the differentiation of cultural institutions; cultural policy and social structure; culture as a property of social groups; conflict and accommodation over efforts to change and sustain traditional culture.

**218. Sociology of Organizations (4)**

An examination of sociological theories of organizational structure and functioning. Critical attention to theories and ideologies of management in bureaucratic organizations. The historical and structural context within which bureaucratic modes of organization emerge and flourish.

**219. Symbolic Interactionism (4)**

A review and analysis of the philosophic grounding of symbolic interactionism in American pragmatism; its development in American sociology as exemplified in the writings of G.H. Mead, Blumer, and R.S. Peribanayagam; its relationship to other interpretive sociologies.

**220. Deviant Behavior (4)**

A critical comparison of current theories of deviant behavior, their application to the variety of such behaviors, as well as their historical antecedents. Also covered will be the political aspects of deviant designation, the creation of deviant subcultures, as well as interaction within them and with the larger society.

**221. Current Perspectives on the Sociology and Philosophy of Science (4)**

This graduate seminar will systematically address the two related and symmetric questions: how can we label in philosophical terms the various brands of modern sociologies of science? How can we empirically define in sociological terms the various schools of contemporary philosophy of science?

**222. Social Movements (4)**

An examination of theories accounting for the causes and consequences of social movements, including a discussion of the strengths and weaknesses of such theories for understanding historically specific revolutions, rebellions, and violent and nonviolent forms of protest in various parts of the world.

**224. Sociology of Development (4)**

Analysis of the interplay among economic, political, social, and cultural forms of modernization, especially in societies that have been going through early phases of industrialization in the post-World War II era.

**225. Madness and Society (4)**

An examination of the historical and sociological literatures on the relationship between madness and society, focusing primarily on the United States and Great Britain, but with some comparative reference to Western Europe.

**226. Political Sociology (4)**

This course discusses the relationship between state and society in a comparative perspective. The focus is on the interaction among states, domestic economic elites, and external economic and political processes in the determination of different developmental paths. Analytically, it includes topics such as characteristics and functions of the state in different types of society throughout history (with an emphasis on the varieties of capitalist and socialist state), the autonomy of the state and its causes in different settings, and developmental and predatory consequences of state activity. Readings will include both theoretical and empirical materials, the latter dealing mostly with nineteenth- and twentieth-century Europe and twentieth-century Latin America.

**230. Advanced Studies in Contemporary Theory, Part I (4)**

The first week of this seminar would be devoted to Parsons and would continue with various American theorists (including Coser, Homans, and Blumer) and the work of Dahrendorf. Such contemporary European theorists as Habermas, Luhmann, Turin, and maybe Giddens will be included in the study as well as several contemporary American neo-Marxists.

**232. Advanced Issues in the Sociology of Knowledge (4)**

The social construction of "knowledge" and the social institutions in which these processes take place are examined. Topics include relationships between knowledge and social institutions, foundations of knowledge in society, knowledge and social interaction, and contrasting folk and specialized theories. *Prerequisites: completion of core and consent of instructor.*

**235. Communism (4)**

This course will examine the ideological framework of communism and historical attempts to realize its ideal goals. The experiences of the Soviet Union and other communist societies will be discussed, with attention to issues such as change in communist systems, varieties of communism, the role of ideology, and economic and political reform.

**236. Contemporary Topics in the Sociology of Science (4)**

This seminar will cover current books and theoretical issues in the sociology of science. Topics will vary from year to year. This course may be repeated from credit.

**237. Historical Sociology of Science (4)**

A critical survey of recent literature in the historical sociology of scientific knowledge, with special reference to the understanding of scientific practice and the social construction of scientific knowledge in particular social settings.

**238. Relativism and the Sociology of Science (4)**

A critical survey of theoretical and empirical sociological work advocating a relativist perspective on scientific knowledge. Special attention is paid to the characterization of different relativist genres, to the debates between relativism, realism and rationalism, and to the empirical grounding of relativism in studies of scientific controversy and closure.

**240. Ethnomethodology (4)**

Topics will include the philosophical origins of ethnomethodology as a social perspective; the epistemological basis of interactional approaches to social behavior in sociology and related disciplines; the role of language use in social contexts; forms of common sense reasoning in everyday life; the interpretation of normative rules; the interaction of different modes of reasoning in particular social settings.

**241. Cognitive and Linguistic Aspects of Social Structure (4)**

Introduction to topics in speech act theory, cognitive approaches to story grammars, and the analysis of conversational or discourse material as they apply to the study of social interaction and organization structures.

## SOCIOLOGY

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### **242. Advanced Topics in Cognitive and Linguistic Aspects of Social Structure (4)**

An advanced seminar dealing with field and quasi-experimental methods for studying discourse and textual materials. Students are expected to conduct their own field research in natural or organization settings.

### **250. Marriage, Family, and Relations between the Sexes (4)**

Theory, research methods, and micro and macro research findings in the family field as they relate to other substantive areas in sociology. Special consideration given current concerns—sex roles, aging, and alternative life-styles.

### **255A-B-C. Seminar in Science Studies (4-4-4)**

(Same as Phil. 209A-B-C and Hist. 209A-B-C.) A three-quarter sequence of readings and discussions, taught each quarter by a member of one of the departments (history, sociology, philosophy) participating in the graduate Program in Science Studies. Required for all students in the program in their first year; those in later years are expected to audit this course, the content of which will change from year to year.

### **256. Ethnographic Research and the Study of Science (4)**

In this course, graduate students can learn field methods through group research on scientific practice. Students will be trained in techniques for making observations, conducting interviews, using diaries, maps and inventories, checking these data against archival sources.

### **260. Sociology of Religion (4)**

The seminar will examine in detail one or two major issues in the anthropology of religion, as for example a theoretical problem like secularization and social change or a more substantive one like shamanism. Students will be notified in advance regarding the seminar topic.

### **262. Comparative Labor History and Labor Movements (4)**

The growing number of outstanding case studies of working-class social history invites comparative analysis. This seminar considers some of the exemplary works on labor in England, France, and the United States; through discussion, we will also use these works to develop a comparative perspective on working-class history and organized labor.

### **265. Comparative Social Policy (4)**

(Same as IP/Gen 453/253.) A macrosociological perspective with an empirical focus on social security, health, welfare, and labor market policies. Examines different national contexts to understand the variety of policy forms, factors that support alternative policy choices, and the role of both public and private sectors. *Prerequisites: graduate standing or consent of instructor.*

### **270. The Sociology of Education (4)**

A consideration of the major theories of schooling and society, including functionalist, conflict, critical and interactional; selected topics in the sociology of education will be addressed in a given quarter, including the debate over inequality, social selection, cultural reproduction and the transition of knowledge, the cognitive and economic consequences of education. Major research methods will be discussed and critiqued.

### **271. Seminar in Classroom Interaction (4)**

Sociolinguistic principles are applied to the study of classroom interaction. Research methods, including media methods, that are applicable to interaction in general, educational settings in particular, are discussed and applied. Videotape from actual school settings form the basis of preliminary presentations. Student projects will be based on videotape of actual classrooms whenever possible.

### **275. Computer Analysis of Large Data Sets (4)**

Students will learn skills needed to create, modify, store, transmit, and analyze large data sets on mainframe and on personal

computers. UNIX, DOS, and SPSS-X will be emphasized, with other computer skills taught as needed.

### **277. The Sociology of Technology (4)**

Social theory has been largely uninterested in technology. The idea of the seminar is to test ideas coming from sociology of technology, ethology, and evolutionary scenarios, and anthropology of tool use, in order to make room in social theory for artifacts.

### **280. Sociological Writing (4)**

This seminar involves (1) reading and discussion on how to write sociology with clarity, precision, and rhetorical force, and (2) close, line-by-line criticism and editing of student papers. At the beginning of the quarter, each student must submit a paper he or she has recently written. At the end of the quarter, it will have been re-written in light of the discussion of it in the seminar.

### **290. Graduate Seminar (4)**

A research seminar in special topics of interest to available staff, provides majors and minors in sociology with research experience in close cooperation with faculty. (S/U grades permitted.)

### **298. Independent Study (1-4)**

Tutorial individual guides study and/or independent research in an area not covered by present course offerings. (S/U grades permitted.)

### **299. Thesis Research (1-2)**

Open to graduate students engaged in thesis research. (S/U grades permitted.)

### **500. Apprentice Teaching (2-4)**

Supervised teaching in lower-division contact classes, supplemented by seminar on methods in teaching sociology. (S/U grades only.)

interdepartmental activities beneficial to students. Finally such a minor contributes to the preservation and renewal of the broad, interdisciplinary style which has distinguished UCSD from other leading research universities.

## CURRICULUM

The minor consists of two required courses, Space Science (AMES 144A) and Space Engineering (AMES 144B), plus four electives to be chosen from a list of courses with the approval of an adviser. The present list of electives includes:

- AMES 137, Aerospace Structural Design
- Chem. 170, Cosmochemistry
- ECE 120, Solar System Physics
- ECE 146C, Microwave Systems and Circuits (extensive prerequisites, lab component)
- Physics 160, Stellar Astrophysics
- Physics 161, Galaxy and Interstellar Medium
- Physics 162, Galaxies and Cosmology

## ▼ SUBJECT A

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For information about satisfying the Subject A requirement, especially prior to enrollment, please refer to "Subject A: English Composition" in the catalog section, "Academic Regulations."

Students who have not satisfied the Subject A requirement before enrolling at UCSD must satisfy the requirement by achieving a grade of C or better in SDCC 1 (English Composition—Subject A) and by passing the Subject A Exit Examination given at the end of SDCC 1. That examination is administered by the Subject A Program office. Students must enroll in SDCC 1 (or ESL) during the first quarter of residence at UCSD. SDCC 1 is a Mesa College course taught at UCSD as part of a cooperative program with the San Diego Community College District.

Under Academic Senate regulations, SDCC 1 cannot be counted towards graduation requirements; however, the course units do count as workload credit towards the minimum progress requirement and eligibility for financial assistance.

For further information about the Subject A requirement or the Proficiency Test, please visit the Subject A Program office, 3232 Literature Building, or call (619) 534-6177.



## ▼ SPANISH LITERATURE

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See Literature.

## ▼ SPACE SCIENCE AND ENGINEERING

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OFFICE: 1512 Galbraith Hall, Revelle College

The space science and engineering minor is a focused set of six upper-division courses open to students with junior standing in one of the following departments: AMES, chemistry, CSE, ECE, or physics. Other students with suitable chemistry, physics, and mathematics preparation may also pursue the minor.

The minor has three objects. It is designed to offer an appropriate preparation for careers in space research and technology, with transcript notation of such a concentration of use to students. The minor can help balance strongly focussed departmental offerings with a broader interdisciplinary approach that can foster



## TEACHER EDUCATION PROGRAM

OFFICE: Building 519, Matthews Administrative and Academic Complex

### Professors

Richard C. Atkinson, Ph.D., *Professor of Psychology, Chancellor*  
 Aaron Cicourel, Ph.D., *Professor of Sociology*  
 Michael Cole, Ph.D., *Professor of Psychology and Communication*  
 Charles Cooper, Ph.D., *Professor of Literature*  
 Hugh Mehan, Ph.D., *Professor of Sociology, Program Coordinator*  
 Frederick Olafson, Ph.D., *Professor of Philosophy*

### Associate Professors

Barbara Tomlinson, Ph.D., *Associate Professor of Literature*  
 Kathryn A. Woolard, Ph.D., *Lecturer, Associate Professor of Sociology*

### Assistant Professors

Ricardo Stanton Salazar, Ph.D., *Assistant Professor of Sociology*  
 Marcelo M. Suarez-Orozco, Ph.D., *Assistant Professor of Anthropology*  
 Olga Vasquez, Ph.D., *Assistant Professor of Communication*

### Lecturers

Victor Cifarelli, Ph.D., *Lecturer, Teacher Education*  
 Kim A. Cooley, M.A., *Lecturer, Supervisor, Teacher Education*  
 Rafael Hernandez, M.A., *Lecturer, Supervisor, Teacher Education*  
 Joanie Janis, M.A., *Lecturer, Supervisor, Teacher Education*  
 Ann Kailani Jones, Ph.D., *Associate Supervisor of PE and Lecturer, Teacher Education*  
 Cynthia Lawrence-Wallace, Ph.D., *Lecturer, Supervisor, Teacher Education*  
 Paula F. Levin, Ph.D., *Graduate Adviser and Lecturer, Teacher Education*  
 José Alfonso Smith, M.S., *Lecturer, Supervisor, Teacher Education*  
 Randall Souviney, Ph.D., *Lecturer, Associate Coordinator, Teacher Education*  
 Daryl Stermon, M.A., *Lecturer, Supervisor, Teacher Education*  
 Irene Vellanueva, Ph.D., *Lecturer, Supervisor, Teacher Education*

The Teacher Education Program (TEP) at UCSD offers the California Multiple Subject Credential (with the option for the Bilingual Cross-Cultural Emphasis in Spanish) for elementary school teachers and the Single Subject Credential in Mathematics or Science Education for sec-

ondary school teachers. A primary focus of TEP is multicultural education. We ask prospective teachers to master the subject matter they will teach and develop a repertoire of teaching practices. In addition, we ask them to become familiar with the impact that culture, social structure, and technology have on the education of the students they teach. To accomplish this goal, we examine the cultural context of schooling and compare the often implicit cultural and linguistic demands of school contexts with those of the community and workplace. We encourage teachers to construct learning environments in which students' cultural knowledge and language are used as valuable educational resources.

Both the Multiple Subject Credential Program and the Single Subject Credential Program consist of a prerequisite component and a professional preparation component. Students will complete a total of six Education Foundations courses during the prerequisite component.

UCSD undergraduates interested in applying to the Teacher Education Program should complete these courses during their junior and/or senior year. They will then apply for admission to the professional preparation component upon completion of their bachelor's degree.

Students who have already completed their bachelor's degree should apply for admission to the prerequisite program for either the Multiple Subject or Single Subject Credential Programs. They will then be reviewed for advancement to the credential program *after* having completed the prerequisite year. These students will then take two years to complete the full credential program at UCSD.

Admission requirements for the Multiple Subject and Single Subject Credential Programs are listed below. For admission information to the prerequisite program, contact the TEP office at 534-1680.

## THE MULTIPLE SUBJECT CREDENTIAL PROGRAM (for teaching grades K-6)

### SELECTION OF TEACHER CANDIDATES

Students apply during the winter quarter of their senior year to begin the program the following fall quarter. Contact the TEP office for current application deadlines. Each prospective candidate is carefully reviewed for admission by a committee composed of faculty and local public school educators, including TEP graduates. The selection committee insures that applicants have completed the requirements for admission listed in

the next section, and then looks for evidence of the following:

1. A strong interest in multicultural approaches to education; a strong desire to improve the quality of American education; a strong desire to develop self-activated learners;
  2. Experience working with children in educational environments, especially in multicultural settings;
  3. Involvement in public service activities;
- Applicants are admitted to the credential program as nondegree graduate students.

## REQUIREMENTS FOR ADMISSION TO THE MULTIPLE SUBJECT CREDENTIAL PROGRAM

Before admission to the professional preparation program, students must complete the following requirements. (Students may be admitted to the prerequisite program if they have not completed the Education Foundations Sequence below. Refer to details given above.)

1. B.A. or B.S. with a major field of study equivalent to one offered at UCSD, or a B.A. or B.S. from another University of California campus. A cumulative GPA of 3.0 from the degree-granting institution is required;
2. Subject Matter Competency (see below);
3. The California Basic Skills Test (CBEST);
4. Education Foundations Sequence (also see Table 1 below):
  - a. TEP 181A-B-C (Practicum in Learning)
  - b. *One* of the following courses: TEP 172 (Child Development and Education), Psychology 101 (Introduction to Developmental Psychology), or TEP 196 (The Psychology of Teaching and Structure of Information for Human Learning). TEP 196 should be taken concurrently with TEP 181A, B, or C.
  - c. TEP 126/Sociology 126 (Social Organization of Education) *or* Sociology 150L (The Politics of Language and Ethnicity).
  - d. *One* of the following courses: TEP 117/Sociology 117 (Language, Culture, and Education), Anthropology 143 (Education and Culture), Com/Hip 122A *or* B (Communication and the Community).
5. Portfolio Requirement: Applicants must submit a portfolio of work, as outlined in the instruction packet available from the TEP office.

### Subject Matter Competency

Credential candidates must demonstrate competency in the breadth of knowledge required to

## TEACHER EDUCATION PROGRAM

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teach the diversified content areas in elementary school curricula. They may do this by passing the General Knowledge section of the Core Battery National Teachers Exam with a score of 660 or higher.

In compliance with the Ryan Act, however, the Teacher Education Program offers a subject matter waiver program. Successful completion of a subject matter waiver program "waives" the requirement to pass the General Knowledge section of the National Teachers Exam. The subject matter waiver program consists of a review of the credential candidate's academic background in order to certify his or her satisfaction of this competency requirement.

In order to successfully complete this waiver program, the candidate must have a UCSD-equivalent bachelor's degree and have taken courses across a breadth of courses in mathematics, natural science, social science, writing and literature, arts and humanities, and physical education. Details are available at the TEP office.

### PROFESSIONAL PREPARATION

The Multiple Subject Credential Program consists of seven professional preparation courses and fifteen weeks of student teaching, all taken at the graduate level.

The seven courses are:

TEP 162 (Computer Applications in Teaching and Learning)

TEP 177 (Health Education)

TEP 178 (Mainstreaming Special-Needs Students)

TEP 191A-B-C (Innovative Instructional Practices)

TEP 193 (Multicultural Education)

and student teaching is offered as:

TEP 180A and 180B (Practicum in Student Teaching)

Students are required to complete the U.S. Constitution requirement prior to completion of the program (satisfied through course work or examination).

### BILINGUAL CROSS-CULTURAL EMPHASIS IN SPANISH

TEP offers a Bilingual Cross-Cultural Emphasis within the framework of the Multiple Subject Credential. This emphasis is designed for students who can teach in Spanish and English. Students interested in completing the Bilingual Cross-Cultural Emphasis must demonstrate:

1. Spanish language fluency (satisfied by verbal interview and completion of two Spanish literature courses, one of which must be taken at the

upper-division level in Latin American or Chicano literature);

2. An awareness of the culture and history of the target community (satisfied by one history course and one culture course covering an Hispanic group/state located in the Americas);

3. A willingness to teach in a bilingual setting;

4. A desire to develop bilingual skills in the area of teaching methodology and language proficiency in Spanish (includes completion of TEP 189 and TEP 192).

A typical student schedule for the professional preparation program is shown in Table 1:

**TABLE 1**

#### The Professional Preparation Program for the Multiple Subject Credential

FALL	WINTER	SPRING
TEP 162	TEP 191B	TEP 191C
TEP 191A	TEP 177	TEP 180B
TEP 193	TEP 180	TEP 178
(TEP 192—Bil Em)		

### THE SINGLE SUBJECT INTERNSHIP CREDENTIAL PROGRAM (for teaching grades 7-12)

TEP offers a Single Subject Credential in mathematics, life sciences, or physical sciences for secondary school teachers.

#### SELECTION OF TEACHER CANDIDATES

Students apply during the winter quarter of their senior year to begin the program the following fall quarter. Contact the TEP office for current application guidelines. Each prospective candidate is reviewed for admission by a committee composed of faculty and local public school educators, including TEP graduates. The selection committee insures that applicants have completed the requirements for admission listed in the next section, and then looks for evidence of the following:

1. A strong interest in multicultural approaches to education; a strong desire to improve the quality of American education; a strong desire to develop self-activated learners;

2. Experience working with children in educational environments, especially in multicultural settings;

3. Involvement in public service activities;

Applicants are admitted to the credential program as non-degree graduate students. Each stu-

dent is also interviewed for a paid internship in a local school district. Interns are responsible for teaching mathematics and/or science courses under the guidance of a TEP supervisor and an on-site adviser. Interns, who are generally hired for part-time teaching loads, receive a salary from the district commensurate with the number of courses they teach.

### REQUIREMENT FOR ADMISSION TO THE SINGLE SUBJECT CREDENTIAL PROGRAM

Before admission to the professional preparation program, students must complete the following requirements. (Students may be admitted to the prerequisite program if they have not completed the Education Foundations Sequence below. Refer to details given above.)

1. B.A. or B.S. with a major field of study in mathematics, computer science, or one of the physical or life sciences. (A UCSD bachelor's degree in engineering or in QEDS or their equivalent will also be accepted.) A cumulative GPA of 3.0 from the degree-granting institution is required;

2. Subject Matter Competency (see below);

3. The California Basic Skills Test (CBEST);

4. Education Foundations Sequence (also see Table 3 below);

a. TEP 171A-B-C (Pre-Internship Practicum in Learning)

b. One of the following courses: TEP 196 (The Psychology of Teaching and Structure of Information for Human Learning), TEP 172 (Child Development and Education), or Psychology 101 (Introduction to Developmental Psychology). TEP 196 should be taken concurrently with TEP 171A, B, or C.

c. Sociology 126 (Social Organization of Education) or Sociology 150L (The Politics of Language and Ethnicity)

d. One of the following courses: TEP 117/ Sociology 117 (Language, Culture, and Education), Anthropology 143 (Education and Culture), Com/Hip 122A or B (Communication and the Community).

5. Portfolio Requirement: Applicants must submit a portfolio of work, as outlined in the instruction packet available from the TEP office.

#### Subject Matter Competency

Credential candidates must demonstrate competency in the area in which they will receive their credential. Students may satisfy

this requirement by passing one of the following Specialty Area Tests of the National Teachers Exam with the related score: Mathematics—630; Biology and General Sciences—680; Chemistry, Physics, and General Sciences—630.

In compliance with the Ryan Act, however, the Teacher Education program offers a subject matter waiver program. Successful completion of this program "waives" the requirement to pass the appropriate Specialty Area Test of the National Teachers Exam. The subject matter waiver program consists of a review of the credential candidate's academic background in order to certify completion of a breadth of course work in his or her specialty area. Applicants must have completed at least four-fifths of these courses prior to admission to the professional preparation program. For further information contact the placement coordinator at the TEP office.

### PROFESSIONAL PREPARATION PROGRAM FOR THE SINGLE SUBJECT CREDENTIAL

Once students are selected, they are provided an intensive program of professional preparation, including a full-time summer program of teaching methods courses. Seminars offered in the evening throughout the year address classroom management, theories of teaching and learning, educating special-needs students, and advanced teaching practices.

The professional preparation program for the Single Subject Credential consists of the following six courses in addition to the Internship Field Experience (TEP 170A-B-C).

- TEP 162 (Computer Applications in Teaching and Learning)
- TEP 174\* (Secondary Mathematics Teaching Practices)
- TEP 175\* (Secondary Science Teaching Practices)
- TEP 176 (Writing, Reading, and Language Instruction)
- TEP 177 (Health Education)
- TEP 178 (Mainstreaming Special-Needs Students)
- TEP 193 (Multicultural Education)

\*Only one of TEP 174 or TEP 175 is required.

Students are also required to satisfy the U.S. Constitution requirement, through course work or examination, prior to completing the professional preparation program.

A typical student schedule for the professional preparation program is shown in Table 2.

**TABLE 2**  
*The Professional Preparation Program for the Single Subject Credential*

SUMMER	FALL	WINTER	SPRING
TEP 162	TEP 170A	TEP 170B	TEP 170C
TEP 174/175	TEP 176	TEP 178	
TEP 177			
TEP 193			

### THE EDUCATION MINOR

TEP offers a minor in education. No courses for the minor may be taken on a Pass/No Pass basis. All colleges at UCSD treat the education minor as a social science. The minor consists of six courses (twenty-four units total) and can be fulfilled in either of two ways:

1. **Minor in Teacher Education** (limited to students preparing to apply to the credential program)

Required courses:

- a. TEP 181A-B-C (Practicum in Learning) or TEP 171A-B-C (Pre-Internship Practicum in Learning)
- b. One of the following courses: TEP 172 (Child Development and Education), Psychology 101 (Introduction to Developmental Psychology), or TEP 196 (The Psychology of Teaching and Structure of Information for Human Learning). TEP 196 should be taken concurrently with a field experience course (TEP 171 or 181).
- c. TEP 126 (Social Organization of Education) or Sociology 150L (The Politics of Language and Ethnicity)
- d. One of the following courses: TEP 117/Sociology 117 (Language, Culture, and Education), Anthropology 143 (Education and Culture), Com/Hip 122A or B (Communication and the Community).

2. **Minor in the Cultural Context of Teaching and Learning**

Required courses:

- a. Three courses from the following:
  - Sociology 117 (Language, Culture, and Education)
  - Sociology 126 (Social Organization of Education)
  - Com/Hip 122A or B (Communication and the Community)
  - Anthropology 143 (Education and Culture)
  - Sociology 150L (The Politics of Language and Ethnicity)
  - Anthropology 118 (Cognitive Anthropology)

- Ethnic Studies 132 (Chicano Dramatic Literature)
- Ethnic Studies 135 (Development of Chicano Literature)
- Ethnic Studies 133 (Hispanic American Dramatic Literature)
- Ethnic Studies 136 (Themes and Motifs in Chicano Literature)
- Ethnic Studies 137 (Chicano Prose)
- Ethnic Studies 138 (Chicano Poetry)
- Ethnic Studies 139 (Chicano Literature in English)
- Ethnic Studies 145 (Spanish Language in the U.S.)
- HILA 131 (A History of Mexico)
- HILA 132 (A History of Contemporary Mexico)
- HIUS 167 (Colloquium in Mexican-American History)
- TWS 7A-B-C or 7AW-BW-CW (Race and Ethnicity in the United States)
- TWS 133 (Contemporary Chicano Issues)
- TWS 135 (Bilingualism: Research and Field Studies)
- b. Three TEP courses. Enrollment in several TEP courses is limited to credential candidates only. Contact the TEP office for further information.

### PROFESSIONAL CLEAR CREDENTIALS

The Teacher Education Program only admits individuals intending to complete both the prerequisite and credential programs outlined above *in their entirety*. This will lead to the award of the Professional Clear Credential from the state of California.

### THE MASTER OF ARTS IN TEACHING AND LEARNING

The Teaching and Learning Course Group offers a master of arts degree, designed to assist professional educators in elementary and secondary schools make instructional decisions based on valid educational information. Participants are offered an extensive overview of principles of educational research which they use to design, implement, and evaluate a curriculum project in their own classrooms.

### ADMISSIONS TO THE M.A. PROGRAM

Admission to the M.A. program is based upon the applicant's undergraduate record, postbaccalaureate work, any previous graduate work, and

## TEACHER EDUCATION PROGRAM

three letters of recommendation. In addition, the Teacher Education Program requires scores from the Graduate Record Examination, possession of a current California teaching credential, and a minimum of one year of successful teaching experience.

Applicants must make the following submissions no later than **March 1**:

1. Submit to the Office of Graduate Admissions, University of California, San Diego, La Jolla, California 92093-0086

a. Official application for admission and awards

b. Nonrefundable application fee (amount specified in application).

2. Submit to the Teacher Education Program, University of California, San Diego, La Jolla, California 92093-0070:

a. Two official transcripts from each college or university attended, including award of a B.A. or B.S. with a minimum 3.0 GPA in the last two years of study.

b. At least three letters of recommendation.

c. Official scores on the Graduate Record Examination (GRE) for the verbal and quantitative aptitude. Applications may be obtained from the Educational Testing Service, Box 955, Princeton, NJ 08540. **In order to have scores sent to the Teacher Education Program, UCSD, follow instructions for reporting scores to unlisted institutions, by entering TEP's address on the "Additional Score Report Form" in the GRE Bulletin. There is no additional charge for use of this form.**

d. Evidence of teaching or educational assignment for the duration of the graduate program. If you do not currently have a teaching contract for 1992-93, any admission decision will be provisional upon your receiving such a position.

e. Verification of a current California teaching credential or equivalent.

f. Verification of a minimum of one year full-time teaching experience.

### RESIDENCE REQUIREMENT

Students must be enrolled for two full-time summer sessions during the course of study. Full-time study is six or more units during the summer.

### PROGRAM OF STUDY

The M.A. in teaching and learning teaches professional educators to design curriculum based on sound educational research. The pro-

gram requirements include forty units of course work and a master's thesis.

Graduates of the University of California credential programs may apply up to fourteen units of courses equivalent to TEP courses toward the M.A. requirements. Graduates of other credential programs may petition to transfer up to eight quarter-units of UCSD-equivalent postbaccalaureate course work toward the fourteen quarter-units of postbaccalaureate course work required by UCSD. No teaching methods courses are transferable, from *any* institution. See course listings at the end of this entry for information on TEP equivalent courses.

All students must complete an additional twenty-six units of graduate course work at UCSD. Students who are accepted into the graduate program begin full-time course work in the summer and attend part-time in fall, winter, and spring quarters and complete program course work with full-time study the following summer. The graduate courses are:

TEP 230A, B, C: Research on Curriculum Design (4 units each)

TEP 231: Advanced Instructional Practices (4 units)

TEP 232: Advanced Topics in Education (4 units)

TEP 290: Research Practicum (1-12 units)

TEP 295: M.A. Thesis (1-8 units)

and other courses as approved by the program coordinator.

Table 3 shows a typical schedule for students in the teaching and learning M.A.

### TABLE 3

#### M.A. in Teaching and Learning: Typical Student's Schedule

POST-BACC WORK	UC credential graduate with 14 transferable postbacc. units	Non-UC cred. graduate with 8 transferable postbacc. units	Graduate with no transferable postbacc. units
<b>SUMMER 1992</b>	TEP 231 TEP 290 (2 units)	TEP 231 TEP 290 Elective (4 units)	TEP 231 TEP 290 Elective (4 units) Elective (4 units)
<b>FALL 1992</b>	TEP 230A	TEP 230A	TEP 230A
<b>WINTER 1993</b>	TEP 230B	TEP 230B	TEP 230B Elective (4 units)
<b>SPRING 1993</b>	TEP 230C	TEP 230C TEP 290 (2 units)	TEP 230C TEP 290 (2 units)
<b>SUMMER 1993</b>	TEP 232 TEP 295	TEP 232 TEP 295	TEP 232 TEP 295

## Courses

The following courses are offered by the TEP faculty. Students are advised to consult with the TEP credential coordinator to determine which courses satisfy credential requirements. Undergraduate students may enroll in graduate seminars with the consent of instructor.

### UPPER DIVISION

#### Anthropology 143. Education and Culture (4)

This course will provide an introduction to anthropological contributions to the understanding of education. We shall consider methodological and theoretical issues in the ethnography of schooling, social interaction in educational settings, language and education, ethnicity and education, psycho-cultural approaches to the study of learning and nonlearning, culture and achievement, culture and cognition, and cross-cultural research in education. *Prerequisite: Anthropology 22 or equivalent, or consent of instructor.*

#### Com/Hip 122A-B. Communication and the Community (4-4)

This course will prepare students to conduct research in a variety of community settings on the institutional and media-derived patterns of communication that affect people's everyday lives. *Prerequisite: Com/Hip 100 or consent of instructor.* (W,S) Staff

#### TEP 117. Language, Culture, and Education (4)

The mutual influence of language, culture, and education will be explored; explanations of students' school success and failure that employ linguistic and cultural variables will be considered; bilingualism, cultural transmission through education. *Prerequisites: Soc. 1A-B or Soc. 2 or consent of instructor.* (F,W,Su) Staff

#### TEP 126. Social Organization of Education (4)

The social organization of education in the U.S. and other societies; the functions of education for individuals and society; the structure of schools; educational decision making; educational testing; socialization and education; formal and informal education; cultural transmission. *Prerequisites: Soc. 1A-B or Soc. 2 or consent of instructor.* (W,S,Su) Staff

#### Sociology 150L. The Politics of Language and Ethnicity (4)

Examines ethnolinguistic conflicts and language policies, comparing cases internationally. Addresses interpersonal as well as macrosocial politics, and emphasizes the relationship of policy to actual language use. Topics include nature of language variations and of ethnicity.

#### TEP 121. Public Service: Practicum in Learning (4)

The relationship between teaching and learning; the relationship between school and community; social and political organization of the schools; philosophical, sociological, and political issues which relate to the U.S. educational system; and the academic achievement of children are examined. Field and academic work focus on culturally diverse children in San Diego schools. This course will satisfy the public service component of the new general-education requirement for Third College (F,W,S) R. Hernandez, I. Villanueva.

#### TEP 162. Computer Applications in Teaching and Learning (4)

This course introduces students to microcomputers viewed as a component of interactive communication media. Students will acquire application skills and hands-on experience with microcomputers and computer networks, examining the possible impact of these new media on the teaching/learning process. The



course assumes a basic familiarity with social science concepts and the logic of social science inquiry. *Prerequisite: upper-division standing or consent of instructor.* (Su,F,S) D. Stermon

**TEP 170A-B-C. Internship Field Experience (8-8-8)**

Each credential candidate works as a paid intern for a period of one year under the guidance of an on-site teacher and university supervisor. The internship (or optional full-time unpaid student teaching assignment) gives the prospective teacher extensive experience organizing and implementing lessons under actual classroom conditions. *Prerequisite: affirmed credential candidate or consent of instructor. Department stamp required.* (F,W,S) J. Smith and D. Stermon

**TEP 171A-B-C. Pre-Internship Practicum in Learning (4-4-4)**

This course series focuses on the teaching/learning process in secondary schools. UCSD students are assigned to tutor students and perform other classroom duties under the supervision of participating teachers in local schools. The UCSD student will provide instruction in science and mathematics a minimum of forty hours per quarter. Weekly lectures on theories of learning, classroom observation, and the social organization of public schools are also required. *Prerequisites: department stamp and instructor's signature for TEP 171A-B-C. Must have successfully completed 171A for 171B, and 171A-B for 171C. TEP 171C enrollment limited to students concurrently applying to the TEP Internship Program.* (F,W,S) D. Stermon and J. Smith

**TEP 172. Child Development and Education (4)**

This course introduces prospective teachers to the cognitive, social, and emotional development of children. Topics include developmental learning theory, the teaching/learning process, maturation, and cross-cultural variation in development. Implications for classroom practice will be drawn. *Prerequisite: affirmed credential candidate or consent of instructor.* (S) Staff

**TEP 174. Secondary Mathematics Teaching Practices (4)**

This course introduces prospective secondary teachers to mathematics teaching techniques. Topics include: mathematics curriculum design, California Model Curriculum Standards, instructional methods, computer applications, selection and use of textbooks, student assessment, lesson planning, and classroom organization. Professional matters such as involvement in curriculum planning, professional organizations, use of paraprofessionals, professional ethics, education law, and parent involvement are also addressed. *Prerequisite: confirmed Secondary Internship Credential candidate or consent of instructor.* (Summer) D. Stermon

**TEP 175. Secondary Science Teaching Practices (4)**

This course introduces prospective secondary teachers to science teaching techniques. Topics include: science curriculum design, California Model Curriculum Standards, instructional methods, computer applications, selection and use of textbooks, student assessment, lesson planning, and classroom organization. Professional matters such as involvement in curriculum planning, professional organizations, use of paraprofessionals, professional ethics, education law, and parent involvement are also addressed. *Prerequisite: confirmed Secondary Internship Credential candidate or consent of instructor.* (Summer) J. Smith

**TEP 176. Writing, Reading, and Language Instruction (4)**

This course satisfies the California Commission on Teacher Credentialing requirement for preparation in reading theory and methods for all credential candidates. Topics include: theories of reading development, integration of the language arts, reading and writing in the content areas, teaching methods and applications of literature. *Prerequisite: affirmed credential candidate or consent of instructor. Department stamp required.* (W) K. Cooley

**TEP 177. Health Education (4)**

This course satisfies the Commission on Teacher Credentialing requirement for Health Education. Topics include: physical education, substance abuse, sex education, cardio-pulmonary resuscitation, nutrition, and first aid. *Prerequisite: affirmed credential candidate or consent of instructor. Department stamp required.* (W,Summer) J. Smith

**TEP 178. Mainstreaming Special-Needs Students (4)**

This course satisfies the Commission on Teacher Credentialing requirement for Special Education. Topics include: preparation in appropriate teaching methods for accommodating special-needs students in the regular classroom, developing an Individual Education Plan, characteristics of special-needs students, lesson planning to accommodate individual differences and legislated mandates. *Prerequisite: affirmed credential candidate or approval of instructor.* (S) C. Lawrence-Wallace

**TEP 180A. Practicum in Student Teaching (9)**

The teacher candidate will be assigned to a classroom in one of the participating schools under the supervision of a participating master teacher. The candidate will begin teaching in the first week of spring quarter and will spend at least six hours a day, five days a week for eight weeks in the classroom. The experience is designed to give the candidate thorough practical classroom experience and diversified responsibilities. *Prerequisites: confirmed TEP candidacy and department stamp required.* (W) C. Lawrence-Wallace, I. Villanueva, J. Janis, and K. Cooley

**TEP 180B. Practicum in Student Teaching Internship (9)**

The teacher candidate will be assigned to a classroom in one of the participating schools under the supervision of a participating master teacher. The candidate will begin teaching in the first week of spring quarter and will spend at least six hours a day, five days a week for eight weeks in the classroom. The experience is designed to give the candidate thorough practical classroom experience and diversified responsibilities. *Prerequisites: TEP 180A and department stamp required.* (S) C. Lawrence-Wallace, I. Villanueva, J. Janis, and K. Cooley

**TEP 181A-B-C. Practicum in Learning (4-4-4)**

Students are assigned as classroom teaching assistants in San Diego public schools. Concurrent course work concerns theories of teaching and learning, multicultural education, and the community context of learning. TEP 181A emphasizes the community context, TEP 181B emphasizes the social organization of schools, and TEP 181C emphasizes the teaching-learning process. *Prerequisite: department stamp and instructor's signature for TEP 181A-B-C. Must have successfully completed 181A for 181B, and 181A-B for 181C.* (F,W,S) P. Levin, J. Janis

**TEP 182A-B-C. Practicum in Interactive Computing (4-4-4)**

The course focuses on interactional computing in teaching-learning and communicative situations. Course work concentrates on interactive computing, application to teaching, learning, bilingualism, and communication. Concurrent with course work, students are assigned to a school or community field site implementing interactive computing. Students will write research reports integrating course work and field experience. *Prerequisite: TEP 162 or consent of instructor.* (F,W,S) D. Stermon

**TEP 189. Curriculum Design for Bilingual Instruction (4)**

Topics addressed in this course include: advanced methods of instruction for bilingual classrooms; teaching in content areas; curriculum developmental in language arts and other subjects; technical teaching vocabulary; integrating bilingual and multicultural educational approaches. *Prerequisite: affirmed TEP candidate or consent of instructor. Department stamp required.* (F) I. Villanueva

**TEP 190. Research Practicum (1-6)**

Supervised research studies with individual topics selected according to students' special interests. Students will develop a research proposal and begin to gather and analyze data. *Prerequisite: affirmed teacher candidacy.* (F,W,S) Staff

**TEP 191A. Innovative Instructional Practices (6)**

This is one of a three-course sequence providing pedagogical methods for teaching. Diverse subject areas are integrated into a single intercurricular course of study by emphasizing activity/inquiry techniques of instruction. *Prerequisite: affirmed TEP candidate.* (F) C. Lawrence-Wallace, I. Villanueva, J. Janis, and K. Cooley

**TEP 191B. Innovative Instructional Practices (6)**

This is one of a three-course sequence providing a theoretical and practical grounding in various pedagogical techniques for teaching. Students pursuing the bilingual emphasis are provided instruction in bilingual teaching techniques within the framework of the course. *Prerequisite: TEP 191A or consent of instructor.* (W) C. Lawrence-Wallace, I. Villanueva, J. Janis, and K. Cooley

**TEP 191C. Innovative Instructional Practices (2)**

This is one of a three-course sequence providing pedagogical techniques for teaching. This course is held concurrently with student teaching. *Prerequisite: TEP 191A-B or consent of instructor.* (S) C. Lawrence-Wallace, I. Villanueva, J. Janis, and K. Cooley

**TEP 192. Bilingual Instructional Practices (4)**

History and models of bilingual education; sociocultural issues associated with second language instruction, legal requirements for public school bilingual program, native language, and ESL teaching methods. *Prerequisite: affirmed TEP candidate.* I. Villanueva

**TEP 193. Multicultural Education (4)**

The purpose of this course is to help prospective elementary and secondary teachers organize their classrooms to make education equitable for all students. Ways to utilize the talents and skills that students from diverse cultural backgrounds bring to school as resources for classroom instruction will be suggested. (F) C. Lawrence-Wallace, H. Mehan

**TEP 195. Apprentice Teaching (4)**

Advanced TEP students are prepared in effective methods of supervising the preparation of UCSD students serving as paraprofessionals in elementary school classrooms. Topics covered include: classroom management, interpersonal relations, supervision techniques, multicultural education, politics in the school, and curriculum development. Each student serves as a discussion leader, and conducts at least two workshops. *Prerequisite: consent of instructor.* Staff

**TEP 196. The Psychology of Teaching and Structure of Information for Human Learning (0 or 4)**

College students tutoring college students. Curriculum: basic applied learning principles, specifying objectives, planning and designing instruction, testing, evaluation, interpersonal communication skills, study skills. Objectives will be assessed by project completion and practicum feedback. This course is not creditable toward professional preparation requirements for the multiple option credential. *Prerequisite: consent of instructor.* (F,W,S) V. Cifarelli

**TEP 198. Directed Group Study (4-2)**

Directed group study, guided reading and study involving research and analysis of activities and services in multicultural education, bilingual education, the teaching-learning process, and other areas that are not covered by the present curriculum. *Prerequisite: consent of instructor.* Staff

**TEP 199. Special Studies (4)**

Individual guided reading and study involving research and analysis of activities and services in multicultural education, bilingual education, the teaching-learning process, and other

## THEATRE

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areas that are not covered by the present curriculum. *Prerequisite: consent of instructor.* Staff

## GRADUATE

### Lit/Writing 272. Research on Composition and Written Discourse (4)

This course will survey current research on composing and written discourse and direct students in research projects involving the analysis of writing. Emphasis will be placed on research which can contribute to a theoretical understanding of the writing process. *Prerequisite: consent of instructor.* C. Cooper

### Lit/Writing 273. Practicum on Research in Composing and Written Discourse (4)

In this course students will design and carry out research studies. Emphasis will be placed on research which can contribute to a theoretical understanding of the writing process. B. Tomlinson

### Psychology 211. Piagetian Theory (3)

Seminar on selected topics in Piaget's theory of cognitive development. *Prerequisite: consent of instructor.* J. Mandler

### Psychology 216. Basic Seminar in Comparative Cognitive Research (4)

This seminar will review current research and theory in cognitive psychology in order to characterize group differences in cognitive functioning. M. Cole

### Psychology 259A-B-C. Advanced Seminar in Comparative Cognitive Research (3-3-3)

An examination of the major theories and relevant data concerning the way in which culturally organized experience influences the nature of thinking. Particular attention will be paid to understanding the presumed relations between culture and thought. M. Cole

### Sociology 241. Cognitive and Linguistic Aspects of Social Structure (4)

Introduction to topics in speech act theory, cognitive approaches to story grammars, and the analysis of conversational or discourse material as they apply to the study of social interaction and organizational structures. A. Cicourel

### Sociology 242. Advanced Topics in Cognitive and Linguistic Aspects of Social Structure (4-4)

An advanced seminar dealing with field and quasi-experimental methods for studying discourse and textual materials. Students are expected to conduct their own field research in natural or organizational settings. A. Cicourel

### Sociology 270. The Sociology of Education (4)

A consideration of the major theories of schooling and society, including functionalist, conflict, critical, and interactional; selected topics in the sociology of education will be addressed in a given quarter, including: the debate over inequality, social selection, cultural reproduction and the transition of knowledge, the cognitive and economic consequences of education. Major research methods will be discussed and critiqued. H. Mehan

### Sociology 271. Seminar in Classroom Interaction (4)

Sociolinguistic principles are applied to the study of classroom interaction. Research methods, including media methods, that are applicable to interaction in general, educational settings in particular, are discussed and applied. Videotape from actual school settings form the basis of discussion. Student projects will be based on videotape of students' own classrooms, whenever possible. H. Mehan

### TEP 220. Research Design for Educational Inquiry (6)

An introduction to descriptive and inferential statistics research design techniques appropriate for research in educational settings, including interview, observation, audio visual and testing which lead to inferences about teacher-student interaction,

classroom organization, curriculum design, and the relationship of the classroom to the school, the community, and society. Experience with computer supported statistics packages is included as part of the course requirements. *Prerequisite: M.A. candidate or consent of instructor.* (F) H. Mehan and R. Souviney

### TEP 230A-B-C. Research on Curriculum Design (4-4-4)

A year-long course sequence which provides an extensive overview of curriculum design principles appropriate for K-12 instruction. Consensus and model building methods will be discussed using case studies of curriculum research and development projects appropriate for various subject areas and grade levels. Participants will design, implement, and evaluate a curriculum project in their own classrooms. (Su,F,W,S) P. Levin

### TEP 231. Advanced Instructional Practices (4)

Selected advanced topics in K-12 instructional practices in various subject areas. Techniques for teaching higher-level cognitive processes and advanced applications of computers and other technology will be stressed. Participants will conduct a field study of promising teaching practices appropriate to their grade level(s) and subject area(s) of instruction. (Su) Staff

### TEP 232. Special Topics in Education (4)

This course explores topical issues in education. It focuses on recent developments which have broad implications for research and practice in teaching and learning. Course topics will vary each time the course is offered. (Su) Staff

### TEP 290. Research Practicum (1-6)

Supervised research studies with individual topics selected according to students' special interests. Students will develop a research proposal appropriate for M.A. thesis, begin to gather and analyze data. *Prerequisites: M.A. candidate and consent of instructor.* (S/U grades only.) P. Levin

### TEP 295. M.A. Thesis (4)

The student will work on the M.A. thesis under the direction of the students' thesis committee chair. *Prerequisites: M.A. candidate and consent of committee chair.* (S/U grades only.)

### TEP 297. Directed Group Study (1-6)

Study and analysis of specific topics under the guidance of a faculty member. Offered for repeated registration. *Prerequisite: consent of instructor.* Staff

### TEP 298. Independent Study (1-6)

Individual guided study and/or independent research in an area not covered by present course offerings. Offered for repeated registration. *Prerequisite: consent of instructor.* Staff

## THEATRE

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OFFICE: 2550 Galbraith Hall, Revelle College

### Professors

Eric Christmas, *Emeritus*  
Frantisek Deak, Ph.D., *Chair*  
Deborah Dryden, M.F.A.  
Floyd Gaffney, Ph.D.  
Jorge Huerta, Ph.D.  
Walton Jones, M.F.A.  
Adele Shank, M.A.  
Theodore Shank, Ph.D.  
Arthur Wagner, Ph.D., *Emeritus*

### Associate Professors

Andrei Both, M.F.A.  
Mary Corrigan, M.A.  
Luther James  
Chris Parry  
Jonathan Saville, Ph.D.  
James Winker, M.F.A.

### Lecturers with Security of Employment

Steven Adler, M.F.A.  
Margaret C. Marshall, M.F.A.  
Patricia A. Rincon, M.F.A.

### Assistant Professors

James Carmody, Ph.D.  
Tony Curiel, M.A.  
Allan Havis, M.F.A.

### Lecturers

Jean Isaacs, B.A.  
Ron Ranson, M.F.A.  
Alicia E. Rincon, M.F.A.  
Judith A. Sharp, B.S.  
Linda Vickerman, D.M.A.

### Adjunct Faculty

John Arnone, B.A.  
Des McAnuff  
Marianne McDonald, Ph.D.

## THE UNDERGRADUATE PROGRAM

The curriculum of the Department of Theatre is based on the belief that a good undergraduate education in theatre should provide the student with a solid background in dramatic literature and the aesthetics and history of theatrical performance as well as exposure to the different artistic components of theatrical art—performance, playwriting, and design. Finally, such an education should incorporate participation in the production process itself.

In addition to providing an integrated program for students desiring a theatre major, the curriculum provides (1) a sequence of courses to fulfill the fine arts and/or humanities requirements for Muir College; (2) courses fulfilling Warren College program of concentration requirements; (3) courses to fulfill Revelle, Third, and Fifth College's fine arts requirements; and (4) elective courses for the general student desiring experiences in theatre.

## THE THEATRE MAJOR

The theatre major provides students with a solid artistic and academic background. The required lower-division courses equip the student with the skills and knowledge necessary for more advanced study in each of the areas of study. The

major is structured so that it can respond both to the needs of students who seek a broad-based "liberal arts" education in theatre or to the needs of students who plan to pursue their studies at the graduate level with the aim of acquiring either an M.F.A. or Ph.D. degree. Students should meet with the department's undergraduate adviser as soon as practical (but no later than the quarter in which they declare a theatre major) in order to plan an appropriate individual course of study.

At least 50 percent of all required course work in theatre must be taken at UCSD. Units of theatre practicum (THPR), or their equivalent, completed elsewhere *do not* satisfy the theatre department's requirements. All required courses must be taken for a letter grade. No theatre department course for which a student earns a grade lower than C- can be counted as satisfying any of the department's graduation requirements.

The requirements for the major are:

### Lower-Division Requirements

- One course from:
  - THPR 1 Practicum—Scenery
  - THPR 2 Practicum—Costume
  - THPR 3 Practicum—Lighting
  - THPR 4 Practicum—Stage Management

*Note:* Students must complete the THPR requirement within one year of declaring a theatre major.
- Each of the following:
  - THHS 1 Drama Survey: Tragedy
  - THHS 2 Drama Survey: Comedy
  - THHS 3 Drama Survey: Modern

*Note:* THHS 1 or THHS 2 or THHS 3 must be completed before taking any upper-division classes in history and theory.
- Each of the area threshold classes:
  - Performance Area—
    - a) THAC 1 (Acting I)

*or*

  - b) Any *one* of THDA 1AB (Ballet I) or THDA 2AB (Modern Dance I) or THDA 3AB (Jazz Dance I)

*Note:* A and B equals a completed course

  - Design Area—
    - a) THDE 1 (Introduction to Design)
  - Playwriting Area—
    - a) THPW 1 (Improvitational Playwriting)

*Note:* The threshold classes listed above must be completed before taking any upper-division courses in each area.

### Upper-Division Requirements

- Any four courses in history and theory (THHS)

- Any four, 4-unit courses in one of the following areas: acting (THAC), design (THDE), choreography, directing, and stage management (THDR), or playwriting (THPW).

- Any four electives.

*Note:* THGE 197, 198, and 199 may not be used as upper-division electives by theatre majors.

### THE THEATRE MINOR

Students should plan their minors and have them approved by the faculty undergraduate adviser prior to their junior year. Courses may not be taken on a Pass/Not Pass basis. The Department of Theatre offers two different ways of structuring a theatre minor. Students may take the theatre minor as listed below or as a second option, take the first two lower-division requirements and *four* upper-division electives.

The requirements for the theatre minor are:

#### Lower-Division Requirements

- One course from:
  - THPR 1 Practicum—Scenery
  - THPR 2 Practicum—Costume
  - THPR 3 Practicum—Lighting
  - THPR 4 Practicum—Stage Management

*Note:* Students must complete the THPR requirement within one year of declaring a theatre minor.
- At least one course from:
  - THHS 1 Drama Survey: Tragedy
  - THHS 2 Drama Survey: Comedy
  - THHS 3 Drama Survey: Modern

*Note:* THHS 1 or THHS 2 or THHS 3 must be completed before taking any upper-division classes in history and theory.

  - THAC 1 Acting I

*Note:* THAC 1 must be completed before taking any upper-division classes in acting.

  - THDE 1 Introduction to Design

*Note:* THDE 1 must be completed before taking any upper-division classes in design.

  - THPW 1 Improvisational Playwriting

*Note:* THPW 1 must be completed before taking any upper-division classes in playwriting.
- One lower-division elective.

#### Upper-Division Requirements

- Any three upper-division courses.
 

*Note:* THGE 197, 198, and 199 may **not** be used as upper-division electives by theatre minors.

## PERFORMANCE AND PRODUCTION OPPORTUNITIES IN THEATRE

### Productions

Undergraduates may audition for all shows produced in the department. Undergraduates are frequently cast in these productions and have often played substantial roles. In addition, the department produces a faculty-directed production on the mainstage. The cast, designers, and crew are all undergraduates.

### Cabaret

Almost every weekend, graduate and undergraduate students produce and/or perform in plays and other events in the department's Studio Theatre.

### Plays in Progress (PIPs)

There will be one undergraduate Play in Progress production slot each quarter, and performances will be in the department's Studio Theatre. Plays developed in the theatre playwriting classes are eligible to be considered for the PIPs.

### Undergraduate Arts Festival

Each spring quarter there is an Undergraduate Arts Festival, scheduled for the ninth and tenth weeks. The festival is a diverse and expansive showcase of work done by UCSD undergraduates in all fields of art.

## UNDERGRADUATE AUDITION POLICY

Each quarter, open auditions will be held for all shows being produced in the subsequent quarter. All undergraduates who have completed THAC 101 (Acting II) are eligible to audition. (This prerequisite is subject to revision.) Complete information about the schedule as well as the format of auditions may be obtained in the department office.

## THE DANCE MINOR

University-trained dancers should have a solid academic base on which to build their dance technique education. Theories and principles of dance as a creative art enrich and develop the trained dancer. Through instruction in choreography, dance moves from a display of technical skills to a creative endeavor. The dance minor will enhance creative expression by providing choreographic and performance opportunities generated by academic instruction.

The dance minor consists of four core courses: three upper and one lower division. These courses concentrate on the principles of composition and choreography, the history of dance, and the process of performance. Dancers receive extensive training in one or more idioms (ballet, modern dance, jazz dance and musical theatre). The dancer's training also includes participation in compositional workshops and productions including historical and contemporary performance experiences.

**Placement and Proficiency**

The technical command of the body and expansion of vocabulary of movement are essential to the dancer's creative expression. All students must maintain continuous participation in studio classes throughout enrollment in the minor. Upon completion of a studio technique course, students who demonstrate the performance level necessary for the next level of work will advance. Students who do not demonstrate the appropriate performance level will be expected to continue at the same level until they qualify for advancement. Only twelve units of movement courses may be applied toward the dance minor.

**Movement Requirements**

A prerequisite for entrance into the dance minor is technical ability above the beginning level in ballet, jazz, or modern. The student's level is determined by audition and, depending on his or her technical ability, the student will be placed at the intermediate or advanced level. Students wishing to enter the minor without intermediate (level II) proficiency must take beginning (level I) courses (up to two years) or until they pass the audition into level II.

Students wishing to enter the minor in dance must audition during classes in spring for placement in the appropriate movement class for fall. Freshman and transfer students may audition the first week of classes in fall quarter.

Dance minors will be required to take movement courses every quarter. Of the total credits earned, **only twelve units from those listed in the movement courses** (see below) **may be applied** toward the dance minor. Students must include at least one movement course other than their main idiom.

**Lower-Division Requirements:**

One Course—Four Units Total  
THAC 1 Acting I  
or  
THDE 1 Introduction to Design

**Upper-Division Requirements:**

Three Courses—Twelve Units Total

THDR 141 Principles of Choreography  
THDR 142 Choreography and Performance  
THHS 150 Dance History

**MOVEMENT REQUIREMENTS:**

Twelve units required in lower- and/or upper-division movement courses. The students' levels are determined by auditions held in class prior to the preregistration deadline. Freshmen and transfer students must audition the first two weeks of fall quarter in the appropriate class.

Choose a total of twelve units from a combination of the following list of movement courses. (Note: Levels II, III, or IV courses may be repeated once for credit.)

THDA 101A, B, or C Ballet II (Intermediate, two units each)  
THDA 102A, B, or C Ballet III (Advanced 1, four units each)  
THDA 103A, B, or C Ballet IV (Advanced 2, four units each)  
THDA 110A, B, or C Modern II (Intermediate, two units each)  
THDA 111A, B, or C Modern III (Advanced 1, four units each)  
THDA 112A, B, or C Modern IV (Advanced 2, four units each)  
THDA 120A, B, or C Jazz II (Intermediate, two units each)  
THDA 121A, B, or C Jazz III (Advanced 1, four units each)  
THDA 122A, B, or C Jazz IV (Advanced 2, four units each)  
THDA 10A, B, or C Musical Theatre (two units each)

Total Lower-Division Core Units	4
Total Upper-Division Core Units	12
Total Movement Units	12
(may be upper- or lower-division units)	

**Total Units for Dance Minor Students** ..... **28**

**PERFORMANCE OPPORTUNITIES**

**Annual Concerts**

The work of selected students is presented at a formal concert each spring.

A concert of faculty and guest artists' choreography is presented each winter.

**Undergraduate Arts Festival**

This festival is held at the end of spring quarter to showcase students' experimental choreography.

**UCSD Dance Repertory**

This repertory is open to dance students through auditions. The company will perform lecture-demonstrations, performances, and mas-

ter classes in the community or at other UC campuses.

**PROFESSIONAL COMPANY INTERNSHIP**

Dance students may apply for positions as interns. These internships provide qualified students an opportunity to work with, observe, and perform in professional companies. Internship possibilities include work with Jazz Unlimited, California Ballet Co., City Moves, Isaacs, McCaleb & Dancers, and other San Diego area professional dance companies.

**HONORS PROGRAM**

The department offers a special program of advanced study for outstanding undergraduates majoring in theatre. Successful completion of the Honors Program enables the student to graduate "With Highest Distinction" (A+), "With High Distinction" (A), or "With Distinction" (A-), depending upon performance in the program.

**ELIGIBILITY**

1. Junior standing (ninety units or more completed)
2. 3.7 GPA or better in the major
3. 3.5 GPA or better overall, which students *must maintain* until final graduation
4. Completion of at least four upper-division theatre courses
5. Recommendation of a faculty sponsor who is familiar with the student's work

**GUIDELINES**

Application to the Honors Program may be made upon completion of ninety units or no later than the fifth week of the quarter preceding the final two quarters before graduation. The Undergraduate Committee will consider the application and, if approved, the student and the principal adviser will have the responsibility of proposing an Honors Thesis Committee to the Undergraduate Committee for final approval.

Students are required to take THGE 196A, Honors Studies in Theatre, and 196B, Honors Thesis in Theatre, *in addition* to the twelve required courses for the major. THGE 196A and B are to be taken consecutively and may not be taken concurrently.

**THE GRADUATE PROGRAM—M.F.A. IN THEATRE**

The Department of Theatre has set an ambitious goal for its M.F.A. program: the training of





artists who will shape the future direction of the theatre. Students at UCSD must be curious about their art. The essential questions they ask are only as good as their knowledge of the art form, including its conventions.

The curriculum for all students involves studio classes and seminars. These are integrated with a progressive sequence of work on productions and with a professional residency at the La Jolla Playhouse.

The M.F.A. program at UCSD is built around the master-apprentice system of training. All the faculty are active professionals who teach at UCSD because of a shared commitment to training young artists. Instruction takes place not just in the classroom, but in theatres around the country where faculty, with students as assistants, are involved in professional productions, including those at the La Jolla Playhouse.

Students graduating from the M.F.A. program at UCSD should be prepared to take positions in the professional theatre in the United States and abroad. Students are now working in New York, in resident theatres, in the film and television industry, and in European repertory theatres. M.F.A. candidates in acting, design, directing, dramaturgy/criticism, playwriting, and stage management will complete at least ninety quarter-units of academic work during their tenure in the program.

## Courses

NOTE: For changes in major requirements and in course offerings implemented after publication, inquire at the office of the Department of Theatre.

The subject codes are:

THAC	Acting
THDA	Dance
THDE	Design
THDR	Directing, Choreography, Stage Management
THGE	General
THHS	History and Theory
THPR	Practicum
THPW	Playwriting

### ■ TH/AC ACTING

#### TH/AC 1. Acting I (4)

An introduction to the fundamentals of acting, from establishing a working vocabulary to the practice of basic skills and principles necessary to the dramatic experience. Central to this course is the focus on imagination as the actor's primary resource. Students are required to attend all Department of Theatre productions in the quarter.

#### TH/AC 10. Theatre Games (4)

Theatre Games is an introductory course to performance. Using theatre games and exercises and a gradual introduc-

tion to text, students will learn a very personal approach to the act of performance. This is a process studio class; it is performance oriented. The grade is based on participation, attendance, and the in-class development of a final project. No experience or prerequisites needed. Offered in Summer Session only.

#### TH/AC 11. Stage Combat (4)

This course teaches the basic falls, punches, kicks, slaps, hair-pulls, and barroom brawling techniques used in theatre, film, and television. Students will learn to perform staged violence safely, effectively, and convincingly. Summer Session only.

#### TH/AC 12. Movement for the Actor (4)

Course emphasizes movement to illuminate character and explore the freedom of mind and body working together. Course includes games, exercises, and energy principles from aikido, tai chi, Laban, Alexander, and yoga to expand the actor's range of characterization through movement. Summer Session only.

#### TH/AC 101. Acting II (4)

Course designed to equip the actor with the basic tools necessary for further stage work. In lectures, exercises and the beginnings of scene study, the student actor will gain confidence in the acting process. *Prerequisite: THAC 1.*

#### TH/AC 102. Acting III (4)

The process of acting, its theory and practice, examined through exercises, text analysis, and the preparation of scenes from the modern repertoire. Audition required. *Prerequisite: THAC 101.*

#### TH/AC 103. Acting IV (4)

Acting IV is a further study of the process of acting, its theory and practice, examined through exercises, text analysis, and the preparation of scenes from the modern repertoire. *Prerequisite: THAC 102.*

#### TH/AC 104. Acting V (4)

Advanced study in the process of acting in which the student actor will concentrate on work in classical texts. Audition required. *Prerequisite: THAC 103.*

#### TH/AC 105. Acting VI (4)

Further advanced study in the process of acting in which the student actor will concentrate on work in classical texts. *Prerequisite: THAC 104.*

#### TH/AC 106. Acting for the Camera (4)

This course is designed to sharpen the performer's basic dramatic abilities and aid in the transition from stage to film work. Examination of film production and its physical characteristics and the acting style needed for work in film and the television. Explorations in staging on the movie set involving differing camera angles. Students will rehearse and perform in simulated studio setting. *Prerequisites: THAC 101, 102, and 103.*

#### TH/AC 107. Improvisation for the Theatre (4)

Improvisation for the theatre explores improvisation techniques as an alternative and unique approach to acting. Students should have a performance background, and should have taken Theatre Games or Acting I.

#### TH/AC 110. Speech for the Actor (4)

Course is designed to establish a clear understanding of the fundamentals of good speech for the theatre. The methodologies explore the practical integration of clear articulation, pronunciation, and oral interpretation as they apply to various contemporary and classical dramatic texts. Students must attend all Department of Theatre productions during the quarter.

#### TH/AC 111. Freeing the Voice (4)

Intensive workshop for actors and directors designed to "free the voice," with special emphasis on characterization and vocal flexibility in a wide range of dramatic texts. This proven method combines experimental and didactic learning with selected exercises, texts, tapes, films, and total time commitment. *Prerequisite: THAC 101.*

#### TH/AC 120. Ensemble (4)

An intensive theatre practicum designed to generate theatre created by an ensemble with particular emphasis upon the analysis of text. Students will explore and analyze the script and its author. Ensemble segments include black theatre, Chicano theatre, feminist theatre, commedia dell'arte theatre. Audition may be required. A maximum of four units may be used for major credit. (Cross-listed with Ethnic Studies 146A.)

#### TH/AC 121. Ensemble (4)

Theatre practicum that emphasizes explorations of ensemble rehearsal process, the extension of performance modes, and the performer/event/audience relationships. Audition may be required. A maximum of four units may be used for major credit. (Cross-listed with Ethnic Studies 146B.)

#### TH/AC 122. Ensemble: Undergraduate Production (4)

An intensive theatre practicum involving creating a theatre production. Includes text analysis and explorations of the directing and acting processes, as well as technical support, and performance. Department stamp required. Audition may be required.

#### TH/AC 123. Studies in Performance (4)

The in-depth study of a particular play culminating in a production. Admission by audition only. A maximum of four units may be used for major credit.

#### TH/AC 190. Major Project in Acting (4)

For advanced performance students. Intensive focus upon a particular challenging role, and for its development within the context of preparation, rehearsal, and performance. May be repeated one time for credit. *Prerequisites: THAC 102, 103, and consent of instructor. Admission by consent of instructor only.* See department for Special Projects Application.

### ■ TH/DA DANCE

#### TH/DA 1A-B. Ballet, Level I Beginning (2-2)

An introduction to classical ballet principles, technique, and terminology. Develops the body for strength, flexibility, coordination, and artistic interpretation. Emphasis on developing a foundation in classical movement for continuation of ballet training. Historical origin of ballet will be discussed along with an introduction to the kinesiological principles of movement. *Prerequisite: THDA 1A is prerequisite for THDA 1B.*

#### TH/DA 2A-B. Modern Dance I, Beginning (2-2)

Introduction to modern dance as a means of visual communication. Pattern variations analyzed in time, space, design, and kinetic sense. Movement exploration includes improvisation and composition. *Prerequisite: THDA 2A prerequisite for THDA 2B.*

#### TH/DA 3A-B. Jazz Dance I, Beginning (2-2)

Emphasis on technical skills, terminology, contemporary compositions and introduction to the history of jazz dance. Explores specific rhythmic exercises, isolations, turns, locomotor combinations to a broad base of musical styles and variations. *Prerequisite: THDA 3A prerequisite for THDA 3B.*

#### TH/DA 10A. Musical Theatre Dance A (2)

The study of American social and theatrical dances from the 1900s to the 1930s. Historical trends in musical theatre will

be discussed with the use of film and text. Stresses choreography and musical analysis and introduces basic tap dance rhythms.

**TH/DA 10B. Musical Theatre Dance B (2)**

A continuation of the exploration of the historical development of musical theatre character dance forms covering the 1930s through the 1960s. Emphasizes composition and movement techniques of this rich period of pioneers and stylists. Choreography for film will be introduced. *Prerequisite: THDA 10A.*

**TH/DA 10C. Musical Theatre Dance C (2)**

Integrates the historical and contemporary trends of musical theatre dance from the 1960s to present. Emphasis on the impact and development of dance techniques used in video, film, and theatre and on advance clarification of performance and choreographic skills. *Prerequisite: THDA 10B.*

**TH/DA 11A. Theatrical Tap (2)**

Emphasis on rhythm, coordination, timing, and theatrical style. Includes intricate rhythms such as riffs, pull backs, and wings. *Prerequisite: THDA 10A.*

**TH/DA 11B. Theatrical Tap (2)**

Introduces more complicated rhythms and advanced principles of dance composition for the theatre. *Prerequisite: THDA 11A.*

**TH/DA 20. Dance Workshop (2)**

The study of aesthetic examination of major choreographic works. Emphasis will be on formulating the creative process into a complete dance form. Department stamp required.

**TH/DA 101A-B-C. Ballet II—Intermediate (2-2-2)**

Continued studio work in ballet technique and terminology. Emphasis on increasing strength, flexibility and balance, and interpretation of classical musical phrasing. Includes concepts of anatomy and physiology in relationship to ballet. *Prerequisites: THDA 1B is prerequisite for THDA 101A. THDA 101A is prerequisite for THDA 101B and THDA 101B is prerequisite for THDA 101C.*

**TH/DA 102A-B-C. Ballet III—Advanced 1 (4-4-4)**

Further emphasis on techniques, projection, terminology, and introduction to point work. Introduces historical ballet choreographic variations. Individual and group composition will be presented and aesthetic criticism applied. Text, film, and video used in depicting the historical evolution of ballet. *Prerequisites: THDA 101C is a prerequisite for THDA 102A. THDA 102A is prerequisite for THDA 102B and THDA 102B is prerequisite for THDA 102C.*

**TH/DA 103A-B-C. Ballet IV—Advanced 2 (4-4-4)**

Designed for students with advanced training and includes point work, pas de deux, classical and contemporary variations, and repertory works. Emphasis on increasing composition and performing skills. The aesthetics of ballet in Western and non-Western cultures will be discussed. *Prerequisites: THDA 102C is a prerequisite for THDA 103A. THDA 103A is prerequisite for THDA 103B and THDA 103B is prerequisite for THDA 103C.*

**TH/DA 110A-B-C. Modern Dance II—**

**Intermediate (2-2-2)**

Further development of movement as an expressive medium. Introduces the principles and elements of modern dance and their relationship to other art forms. Discussion of modern dance pioneers. *Prerequisites: THDA 2B is a prerequisite for THDA 110A. THDA 110A is a prerequisite for THDA 110B and THDA 110B is prerequisite for THDA 110C.*

**TH/DA 111A-B-C. Modern Dance III—**

**Advanced 1 (4-4-4)**

Emphasis is on the development of modern dance as an expressive art concept. Individual and group choreography will be explored and aesthetic concepts. Incorporates ap-

plied physiological principles of human movement. Discussion of modern and postmodern trends using text, video, and film. *Prerequisites: THDA 110C is a prerequisite for THDA 111A. THDA 111A is a prerequisite for THDA 111B and THDA 111B is prerequisite for THDA 111C.*

**TH/DA 112A-B-C. Modern Dance IV—**

**Advanced 2 (4-4-4)**

A continuation of advanced exploration of dance as an expression of artistic and social communication. Contemporary and historical choreographic styles will be reviewed. Advanced principles of composition and dance aesthetics will be discussed. *Prerequisites: THDA 111C is a prerequisite for THDA 112A. THDA 112A is a prerequisite for THDA 112B and THDA 112B is prerequisite for THDA 112C.*

**TH/DA 120A-B-C. Jazz Dance II—**

**Intermediate (2-2-2)**

Further development of technical skills, terminology, and intermediate rhythmic patterns. Emphasis includes historical and current trends, and general concepts of anatomy and physiology in relationship to movement. Theories of spatial forms and structure will be discussed. *Prerequisites: THDA 3B is a prerequisite for THDA 120A. THDA 120A is a prerequisite for THDA 120B and THDA 120B is prerequisite for THDA 120C.*

**TH/DA 121A-B-C. Jazz Dance III—**

**Advanced 1 (4-4-4)**

Techniques of body control, with a final performance focus. Development of movement theory as related to the performer. Application of constructive criticism to the performer utilizing small group and solo choreography. Includes discussions of jazz dance and its effect of social-cultural and human behavior. *Prerequisites: THDA 120C is a prerequisite for THDA 121A. THDA 121A is a prerequisite for THDA 121B and THDA 121B is prerequisite for THDA 121C.*

**TH/DA 122A-B-C. Jazz Dance IV—**

**Advanced 2 (4-4-4)**

Extensive study in the development of movement theory as related to the performer. Includes lectures on choreographic principles, compositional forms, constructive criticism, and the history of jazz as an American art form. *Prerequisites: THDA 121C is a prerequisite for THDA 122A. THDA 122A is a prerequisite for THDA 122B and THDA 122B is prerequisite for THDA 122C.*

**TH/DA 130. Studies in Performance—Dance (2-4)**

The in-depth study of a major dance production, culminating in a production. Admission by audition only. A combined total of twelve units of THAC 123 and THDA 130 may count toward graduation.

**TH/DA 131. Dance Repertory (2)**

The study and aesthetic examination of major choreographic works created by dance faculty of the Department of Theatre or distinguished guest artists. Audition is required.

**TH/DA 132. Dances of the World (4)**

Course designed for in-depth study of the dance of a particular culture—Afro-Cuban, Spanish, Balinese, Japanese, etc. Specific topic will vary from quarter to quarter.

**TH/DA 197. Field Studies in Dance (2-8)**

Designed for advanced students, this course significantly extends their knowledge of the theatre and dance through intensive participation in the creative work of a major professional theatre or dance company under the guidance of artists resident in those theatres or companies. Students will submit regular written evaluations each week of their ongoing field study. *Prerequisites: upper-division standing and consent of instructor required.*

**TH/DE THEATRE DESIGN**

**TH/DE 1. Introduction to Design for the Theatre (4)**

A survey of contemporary and historical concepts and practices in the visual arts of the theatre; studies in text analysis, studio processes and technical production; elementary work in design criticism, scale model making, and costume design. A course serving as an introduction to theatre design and production.

**TH/DE 101. Theatre Production: Scenery (4)**

One of three survey classes in theatre production. This course introduces students to stage equipment, the elements of scenic design, drafting, painting, model making, and critical analysis of scenic design for the theatre. *Prerequisite: THDE 1.*

**TH/DE 102. Scene Design (4)**

Projects in scene design, emphasizing script analysis, research, conceptualization, and visual expression. Studio work includes scale model building, or rendering in various media for specific plays. *Prerequisite: THDE 101.*

**TH/DE 111. Theatre Production: Costumes (4)**

This course surveys the process of costume designer from script analysis, research, drawing, and rendering the costume sketch through the process of costume construction and related skills: millinery, fabric painting/dyeing, armor. Lecture and demonstration labs will parallel lecture material. This course is for those interested in a basic understanding of the costumer's process. No previous drawing or painting skills required. *Prerequisite: THDE 1.*

**TH/DE 112. Costume Design (4)**

Projects in costume design, emphasizing script analysis, research, conceptualization, and visual expression. Studio work includes costume rendering in various media for specific plays. THDE 113, 114, 133 recommended. *Prerequisite: THDE 111.*

**TH/DE 113. Evolution in Fashion (4)**

A survey history tracing the evolution of clothing as an art form within its social and cultural context. THDE 113 covers material from Greek and Roman civilizations through the eighteenth century in Europe. THDE 113 and 114 are offered alternate years. Upper-division standing. *Prerequisite: THDE 1.*

**TH/DE 114. Evolution in Fashion (4)**

A survey history tracing the evolution of clothing as an art form within its social and cultural context. THDE 114 develops these principles in the context of the nineteenth century and twentieth century. THDE 113 and 114 are offered alternate years. Upper-division standing required. *Prerequisite: THDE 1.*

**TH/DE 121. Theatre Production: Lighting (4)**

One of three survey classes in theatre production. This course introduces students to stage lighting equipment, the elements of lighting design, drafting, and critical analysis of lighting for the theatre. *Prerequisite: THDE 1.*

**TH/DE 122. Lighting Design/Craft and Mechanics—Advanced (4)**

This course covers lighting design theory, craft, and organizational techniques. Student will learn drafting of light plots, types and calculation of lighting for different spaces and production styles, methods for recording the design, craft skills and techniques of an assistant lighting designer. Field trip. (Part one of a two-part sequence. See THDE 123.) *Prerequisites: THDE 1 and THDE 121.*

**TH/DE 123. Lighting Design/Composition and Ideas—Advanced (4)**

This course aims to develop the student designer's visual imagination in the context of lighting design and composition through a series of studio/lab practical projects. These empha-

size research, conceptualization, visual expression, and collaboration. Studio work involves manipulating light and color and drafting a light plot. (Part two of a two-part sequence. See THDE 122). *Prerequisites: THDE 1 and THDE 121.*

**TH/DE 131. Special Topics in Theatre Design (4)**  
A course designed to expose the theatre design student to a variety of specialized topics, including millinery, pattern, drafting and draping, scenic painting, model making, rendering, drawing. Topics will vary from quarter to quarter. *Prerequisite: THDE 101 or 111 or 121.*

**TH/DE 132. Drafting for the Theatre (4)**  
Studies in technical drawing for the theatre designer and technician. Through instruction and laboratory exercises, the student attains a basic understanding of technical drawing and graphic skills to effectively communicate design ideas to scenic and lighting workshops. *Prerequisite: THDE 101 or 121.*

**TH/DE 133. Visual Ideas (4)**  
This course is an exploration of fundamental ideas (ways of seeing, thinking, expression, style, etc.) throughout the history of visual arts, from the Renaissance to the present. Special emphasis on theatrical space and design, as they reflect significant artistic movements. An integrated study through reading, research, projects, and lecture. THHS 105 or 106 or 107 recommended. *Prerequisite: THDE 1 and upper-division standing.*

**TH/DE 190. Major Project in Design/Theatre Production (4)**  
For the advanced design/production student. Concentration on a particularly challenging design or theatre production assignment, including such areas as assistant designer (scenery, lighting, or costumes), technical director, master cutter, or master electrician. May be repeated one time for credit. *Prerequisites: admission by consent of instructor only. See department for Special Projects Application.*

### ■ TH/DR DIRECTING/CHOREOGRAPHY/ STAGE MANAGEMENT

**TH/DR 15. From Here to Broadway: The Development of a Broadway Play (4)**  
An exploration of the world of professional theatre production in America, focusing on the artistic and economic factors involved in bringing a play from the regional theatre to Broadway.

**TH/DR 101. Stage Management (4)**  
Discussion and research into the duties, responsibilities, and roles of a stage manager. Work to include studies in script analysis, communication, rehearsal procedures, performance skills, and style and concept approach to theatre. THGE 1 and THDE 1 recommended.

**TH/DR 110. History and Art of Directing (4)**  
An examination of the director's artistic and interpretive responsibilities. Emphasis on the historical evolution of the director as central artist in the theatre. Concentration on the research, analysis, and textual preparation for directing.

**TH/DR 111. Directing Process (4)**  
An introductory course in directing practice using information-getting exercises, improv, text analysis. Culminates in the guided rehearsal process of a scene or scenes from a play chosen by the instructor. *Prerequisite: THDR 110.*

**TH/DR 112. Advanced Directing (4)**  
A studio course focusing on the creation (with actors) of a physical realization of text. Course uses selected scenes as model studies in which problems of composition, development of action, interaction of characters, motivational movement and fusion of text and action are explored. Interview required. *Prerequisites: THDR 110 and 111.*

**TH/DR 140. Art and Theory of Movement (4)**  
Participants will learn movement theories, increasing aesthetic awareness. Improvisation techniques will evaluate kinesthetic awareness. Students will create movement studies utilizing creative expression and movement communication. *Prerequisite: THDA 1B or 2B or 3B.*

**TH/DR 141. Principles of Choreography (4)**  
Presents the concepts and elements of dance creation through studies, readings, discussions, and examination of theories. This course is the foundation of the fundamentals of dance composition.

**TH/DR 142. Choreography and Performance (4)**  
Theories and techniques of advanced choreographic problems exploring a range of performance options including multimedia collaborations using video, text, lighting, props, masks, dance/music improvisations, and environmental choreography and performance. *Prerequisite: THDR 141.*

**TH/DR 190. Major Project in Directing (4)**  
For the advanced student in directing. Intensive concentration on the full realization of a dramatic text from research and analysis through rehearsal and into performance. See department for application. *Prerequisites: THDR 110, 111, 112, and consent of instructor.*

**TH/DR 191. Major Project in Stage Management (4)**  
For the advanced student in stage management. Intensive concentration on the full realization of a dramatic text, from research and analysis through rehearsal and final performance. See department for application. *Prerequisites: THPR 4, THDR 101, and consent of instructor.*

### ■ TH/GE THEATRE GENERAL

**TH/GE 1. Introduction to the Theatre (4)**  
An introduction to fundamental concepts in drama and performance. Students will attend performances and learn about how the theatre functions as an art and as an industry in today's world.

**TH/GE 2. From Text to Performance (4)**  
Examination of representative dramatic literature from the text through rehearsal, to the culminating performance. Lectures on the play and its background, the work of the actor, director, and designers. Attendance at rehearsals and a performance of the play.

**TH/GE 11. Great Performances on Film (4)**  
Course examines major accomplishments in screen acting, from the work of Charlie Chaplin and Orson Welles to that of present day stars. Analysis of the script, the details of the production, the craft of the actor, and how these come together to produce the art of cinematic performance.

**TH/GE 12. Great Films of Great Plays (4)**  
Examination of selected contemporary films based upon important plays. Involves viewing films, reading plays upon which they were based, and discussion of the transition of themes and artistic choices made in translation from one media to another.

**TH/GE 13. Shakespeare on Stage and Screen (4)**  
A close look at the performance of Shakespeare's plays in the theatre from the point of view of actor and director, illustrated with scenes presented live and on film.

**TH/GE 14. Rock Performance (4)**  
An examination of the American and European rock performances as a theatrical activity by developing a knowledge of the theatrical components of performance and analysis of text.

**TH/GE 15. Introduction to World Theatre (4)**  
An exploration of dramatic forms and traditions from a range of cultures. Topics may include ritual and theatre;

theatre and society; script and improvisation; acting and the actor; gesture; costuming and scenic space.

**TH/GE 20. Introduction to Performance (4)**  
An introduction to the fundamentals of acting, including awakening the imagination, establishing a working vocabulary, and the practice of basic skills and principles necessary to the dramatic experience.

**TH/GE 90. Undergraduate Seminar (1)**  
Discussion of various theatre topics.

**TH/GE 101. Apprenticeship/La Jolla Playhouse (4)**  
Professional production experience with performance training. In addition to conservatory class work, apprentices are with a production for the entire rehearsal and performance process. Assignments from two to eleven weeks, May–August depending on availability. *Prerequisites: audition/interview, upper-division standing, resume, three letters of recommendation.*

**TH/GE 102. Conservatory/La Jolla Playhouse (12)**  
Concentrated studies in acting, scene study, text analysis, voice, speech, and movement. Taught by faculty from the La Jolla Playhouse and UCSD Department of Theatre. Eight-week program, Tuesday–Friday, 9:00 a.m.–5:00 p.m., concluding with a workshop presentation. A maximum of eight units may count as elective credit toward the major. These units must be petitioned through the Department of Theatre.

**TH/GE 195. Instructional Assistance (2 or 4)**  
Assist with instruction in undergraduate theatre courses. Full description of duties will appear on the "Application for Instructional Assistance."

**TH/GE 196A. Honors Studies in Theatre (4)**  
This course will allow theatre honors students to explore advanced issues in the field of theatre. It will also provide honors students the opportunity to develop an honors thesis on the topic of their choice and begin preliminary work under faculty supervision. Department stamp required. Can be taken for a letter grade only. Other requirements are junior standing (ninety, plus units); 3.5 GPA up to graduation; 3.7 GPA in major; must have completed at least four upper-division theatre courses; recommendation of faculty member familiar with student's work.

**TH/GE 196B. Honors Thesis in Theatre (4)**  
This course will provide honors candidates an opportunity to complete the research on and preparation of an honors thesis under close faculty supervision. Can be taken for a letter grade only. Other requirements are junior standing (ninety, plus units); 3.5 GPA overall up to point of graduation; 3.7 GPA in major; must have completed at least four upper-division theatre courses; recommendation of a faculty member familiar with student's work. Department stamp required.

**TH/GE 197. Field Studies (2–8)**  
Designed for advanced students, this course significantly extends their knowledge of the theatre through intensive participation in the creative work of a major professional theatre or company under the guidance of artists resident in those theatres or companies. Students will submit regular written evaluations each week of their ongoing field study.

**TH/GE 198. Directed Group Studies (0-2-4)**  
Group studies, readings, projects, and discussions in theatre history, problems of production and performance, and similarly appropriate subjects.

### ■ TH/HS THEATRE HISTORY

**TH/HS 1. Drama Survey: Tragedy (4)**  
A close examination of plays that reveal man as overreacher, man as a dreamer, man as a self-destroyer, and man as both victim and victor in the conflict with his cosmos.

**TH/HS 2. Drama Survey: Comedy (4)**

Study of comic tradition from Aristophanes to the end of the nineteenth century.

**TH/HS 3. Drama Survey: Modern (4)**

A close examination of a selection of modern plays that draw from the tragic and comic traditions to generate theatre that reflects the modern consciousness. Particular consideration will be given to the multiple formalistic experiments of the twentieth century, ranging from the expressionism to the epic theatre.

**TH/HS 4. Introduction to Contemporary Chicano Theatre (4)**

A survey of the development of contemporary Chicano theatre from the indigenous roots in Aztec and Maya dance/drama to the emergence of the Teatro Campesino and other "Teatros" in the mid-1960s. The course will focus on Chicano theatre as ritual and document especially in the early "Actos" of Luis Valdez and other Chicano theatre groups and playwrights.

**TH/HS 5. Introduction to Black Drama (4)**

Course designed to provide students with a meaningful and accurate definition of the black artist within the American theatre, past, present, and future. Some quarters will deal with a single black artist, playwright, director, or actor.

**TH/HS 101. Topics in Dramatic Literature and Theatre History (4)**

An in-depth exposure to an important individual writer or subject in dramatic literature and/or theatre history. Topics vary from quarter to quarter. Recent courses have included Modern French Drama, and the History of Russian Theatre.

**TH/HS 102. Masters of Theatre (4)**

Focus on the artists of seminal importance in the theatre. Consideration will be given to theory and practice of the artist, with emphasis on theatrical realizations that can be reconstructed by integrated research. Examples of recent courses include Molière, Fugard, and Strindberg. *Prerequisite: THHS 1 or THHS 2 or THHS 3.*

**TH/HS 103. Ancient Greek Drama in Modern Version (4)**

Ancient Greek plays still ask questions that need to be asked. Studies ancient myths as they reappear in contemporary files, on stage, and in opera. Includes analysis of media techniques in examining ancient Greek drama in its living form.

**TH/HS 105. Topics in Classical Comedy (4)**

An advanced study of selected aspects of Romantic comedy, the comedy of manners, and farce from the seventeenth to the early twentieth centuries.

**TH/HS 106. Romantic Theatre (4)**

Examines the influence of the nineteenth century Romanticism on contemporary theatre and Romanticism as a fundamental attitude toward art and life present throughout history. Emphasis on how the Romantic premises and attitudes found their expression in elements of theatrical structure.

**TH/HS 107. Realistic Theatre (4)**

Examines the influence of nineteenth-century realism on contemporary theatre and realism as one of the fundamental attitudes toward art and life present throughout history. Emphasis on how the realistic premises and attitudes found their expression in elements of theatrical structure.

**TH/HS 108. Topics in the History of Avant-Garde Theatre (4)**

The course will cover the tradition of the avant-garde theatre performances from the end of the nineteenth century to the Second World War. It will deal with the individual artists as well as movements that were the most representative and influential on the culture of the twentieth century.

**TH/HS 109. Modern Black Drama (4)**

From Lorraine Hansberry's *Raisin in the Sun* to the latest plays of Ed Bullins. Black drama has mirrored and, occasionally, forecast the mood and aspirations of black people in America. Course examines plays, playwrights, and participants in contemporary black theatre. (Cross-listed with Ethnic Studies 177.)

**TH/HS 110. Chicano Dramatic Literature (4)**

Focusing on the contemporary evolution of Chicano dramatic literature, course will analyze playwrights and theatre groups that express the Chicano experience in the United States, examining relevant "actos," plays, and documentaries for their contributions to the developing Chicano theatre movement. (Cross-listed with Ethnic Studies 132.)

**TH/HS 111. Hispanic-American Dramatic Literature (4)**

Course examines the plays of leading Cuban-American, Puerto-Rican, and Chicano playwrights in an effort to understand the experience of these Hispanic-American groups in the United States. (Cross-listed with Ethnic Studies 133.)

**TH/HS 112. Experimental Theatre (4)**

Course dealing with the forms of contemporary theatre and principal figures in the contemporary theatre world—playwrights, directors, designers, and performers.

**TH/HS 113. Contemporary American and British Drama (4)**

Survey of the American and British works from the 1950s to the present. Playwrights to be read include writers such as Pinter, Hare, Churchill, Brenton, Osborne, Albee, Guare, Shepard, Durang, Mamet, and Fornes. Course may include assigned visit to local theatre production.

**TH/HS 114. American Musical Theatre (4)**

The class will explore this vital and unique theatre form by examining its origins, evolution components, and innovators. Special emphasis is placed on the process of adaptation and the roles of the director and choreographer.

**TH/HS 150. Dance History (4)**

A study of dance as a reflection of history; its responses to social, economic and cultural changes, and its development as a theatrical art. An overview of the aesthetic components of dance from its origins to the twentieth century.

**TH/PR PRACTICUM****TH/PR 1. Practicum—Scenery (4)**

A production performance oriented course that introduces fundamentals of scenery constructed and its theatrical operation. Laboratory format allows students to work through the scenery production process culminating in a crew assignment for a fully mounted theatrical production.

**TH/PR 2. Practicum—Costume (4)**

A production performance oriented course that introduces fundamentals of costume construction and its integration into theatre operations. Laboratory format allows students to work through the costume production process culminating in a crew assignment for a fully mounted theatrical performance.

**TH/PR 3. Practicum—Lighting (4)**

A production performance oriented course that introduces fundamentals of stage lighting or sound and its technical operation. Laboratory format allows a student to work through the lighting or sound production process culminating in a crew assignment for a fully mounted theatrical production.

**TH/PR 4. Stage Management (4)**

A production performance oriented course that introduces fundamentals of stage management. Laboratory format allows students to work through entire production process culminating in a fully mounted theatrical production.

**TH/PW PLAYWRITING****TH/PW 1. Introduction to Playwriting (4)**

A workshop designed to liberate the dramatic imagination. Students develop character and action through a variety of individual and group exercises that involve activities such as real-world observation, acting improvisations, or written work.

**TH/PW 101. Playwriting Workshop I (4)**

Second in the playwriting series, THPW 101 focuses on dramatic structure. Students write a one-act play via a series of exercises that develop dramatic action, character, dialogue. Workshop classes include lectures and group discussions of students' writing. *Prerequisite: THPW 1.*

**TH/PW 102. Playwriting Workshop II (4)**

Continuation of the playwriting process, focusing primarily on character development and writing dialogue. Students will write a one-act play which may be for a specific non-theatre space. Group discussion of work. *Prerequisite: THPW 101.*

**TH/PW 103. Playwriting Workshop III (4)**

Projects for advanced playwrights will be decided upon an individual basis and may be either a one-act or full-length play. Each step of the development of the play will be discussed by the group. *Prerequisite: THPW 102.*

**GRADUATE**

NOTE: The theatre graduate program is currently under review, and substantial changes may result. Students should consult with the departmental graduate adviser to determine the exact details of the program and the course offerings at the time.

**200. Dynamics (1)**

A daily program of physical, vocal, and speech exercises designed to prepare the student to move in a focused way into specific class areas with minimum amount of warm-up time. The exercises work on development of flexibility, strength, and coordination throughout the body. Strong emphasis is placed on physical and mental centering within a structured and disciplined approach to preparation.

**201. Stage Combat (2)**

A study of the dramatic elements of stage violence, and practical work in developing the physical skills necessary to fully realize violent moments on the stage. At the core of the study is the process from text to convincing theatrical action. Physical work revolves around basic principles of energy, focus, and center inherent in unarmed and weapons combat.

**202. Collaborative Process (3)**

The process of collaborative creation from idea to performance. *Prerequisite: graduate standing.*

**203. Text Analysis for the Actor (2)**

A course designed to introduce the actor to the principles of text analysis, character analysis, and scoring, using the theories of transactional analysis as the principle tool. Lectures and discussions on the principles of Constantin Stanislavsky and Eric Berne, and presentation of sample text analysis by members of the class form the structure of the course. *Prerequisite: graduate standing.*

**204A. Text Analysis (4)**

Topics to be covered will include: (1) concept of poetic language; lexical and syntactic analysis of dialogue; (2) the semantic context of dialogue; (3) thematic structure, from motive to themes; (4) the concept of dramatic character or hero; (5) dramatic narrative; (6) the material of drama; the



relationship of myth and ritual to drama; (7) analysis versus interpretation; (8) practical applications.

**204B. Contemporary Theories of Theatre (4)**

An investigation of contemporary theories of theatre with an emphasis on structural and poststructural perspectives on text and textuality. The seminar will focus on adapting contemporary techniques of close reading to the interpretive and creative processes in the theatre. *Prerequisite: graduate standing.*

**205. Improvisation for the Theatre (3)**

A course designed to introduce improvisational techniques to professional acting students. A variety of approaches to the art of improvisation will be presented and practiced, both serious and comic. Small and large group improvisations will be offered for participation.

**206. Concepts in Stage Movement (3)**

The discussion and analysis of choreographic movement and patterns and the interrelationship of objects in space. Includes practical work. *Prerequisite: graduate standing.*

**207. Production (1-12)**

The collaborative process from the rehearsal process through public performance. All participants will enroll in the same section, the number of units depending upon degree of involvement. When appropriate, weekly meetings for supplementary exploration will be added, and students will receive one additional unit.

**208. Contemporary Performance (2)**

An introduction to performances, ideas, and individuals in contemporary theatre. Work outside of class involves reading, viewing of videotapes, and the preparation of performance compositions. Intended for all first-year graduate students in theatre.

**209. Comic Techniques (2)**

A course designed to provide actors with tools, both physical and verbal, to play comedy. Included will be commedia del arte techniques, clown work, masks, circus techniques, mime, and scene work from comic scripts. *Prerequisite: graduate standing.*

**210A-B-C. Acting Process I: Realism (3-3-3)**

The actor's process is analyzed and experienced through a series of exercises designed to introduce the actor to the principles of "action" and "objective" followed by scene work from realistic texts employing an "actor's score" as a viable tool, culminating in intensive work on Chekhov. *Prerequisites: 210A for B; 210B for C.*

**211A-B-C. Speech for the Actor I (1-1-1)**

Introduction of the principles of phonetics and articulation. Constant study and drill to prepare the actor for standard speech and flexibility. *Prerequisite: graduate standing.*

**213-A-B-C. Movement for Theatre I (2-2-2)**

An intensive studio course in the art of movement as a basis for theatre performance. Theory and practice of energy flow, weight, spatial focus, time consumption, and the shape factor. (S/U grades only.) *Prerequisites: 213A for B, 213B for C.*

**214A-B-C. Voice for Theatre I (2-2-2)**

Voice exercises designed to "free the voice" with emphasis on diaphragmatic breathing, articulation exercises, and singing exercises. Course designed to broaden pitch, range, projection, and to expand the full range of potential characterizations. (S/U grades only.) *Prerequisites: 214A for B; 214B for C.*

**215. Stage Makeup (1)**

Course moves from fundamentals of makeup for the theatre (historical styles; development of makeup media) to special effects derived from various materials, facial structure and

basic makeup design, color and light in makeup, basic application theory and technique. *Prerequisite: graduate standing.*

**216. Singing for the Actor I (1)**

Vocal technique for the musical theatre. Exercises, scales, sight reading, ensemble work, preparation of individual pieces. *Prerequisite: graduate standing.*

**217. New Plays Workshop (1-4)**

A weekly workshop with actors, directors, writers, and dramaturgs. Course will focus on the development of stage readings of new works by the playwriting students. *Prerequisite: graduate standing.*

**218. Introduction to Directing (1-4)**

An introduction to the fundamental tools and resources of the director by the examination of scene work from four plays. This course is designed for students not in the directing program. *Prerequisite: graduate standing.*

**219. Directing Process Studio (2/4)**

Preparation, presentation, and discussion of representative scenes from various periods of dramatic literature. *Prerequisite: graduate standing.*

**220A-B. Acting Process II: Classical Text (3-3)**

An intensive studio examination of problems and potentials associated with the theatrical realization of the classical text.

**221A-B. Speech for the Actor II (2-2)**

Advanced work in phonetics and articulation. Intensive study of stage dialects to prepare actor for variety of roles. *Prerequisite: graduate standing.*

**223A-B. Movement for Theatre II (2-2)**

An advanced course in the art of movement for the theatre, building on the knowledge gained in Theatre 213. (S/U grades only.) *Prerequisite: 223A for B.*

**224A-B. Voice for Theatre II (2-2)**

Advanced voice training designed to help the actor fuse voice, emotion, and body into a fully realized reflection of the text. (S/U grades only.) *Prerequisite: 224A for B.*

**225A-B. Singing for the Actor II (1)**

Continuing vocal technique for the musical theatre. More complicated musical material investigated and prepared. *Prerequisite: graduate standing.*

**226. Hispanic-American Theatre History (4)**

A study of the major Hispanic-American theatrical movements, from the early Spanish colonial religious drama of the southwest to the current Hispanic-American theatre movement. Course work will focus on prominent figures as well as representative plays of the periods studied. *Prerequisite: Theatre 42, 43, 44, and consent of instructor.*

**227. Hispanic-American Dialects (4)**

Intensive work on the major Hispanic-American dialects, focusing on Chicano, Nuyorican, and Cuban American distinctions in English. Particular dialects will be based on the needs of the growing canon of Hispanic-American plays.

**228. Popular Entertainment Techniques (4)**

Popular Entertainment Techniques will focus on a variety of styles employed in popular theatre throughout the world. Course work will include movements such as the *Teatro Campesino*. The theatre of Augusto Boal and Enrique Bonaventura will be explored with guest instructors and resident professionals.

**229. Theatre Externship (9-12)**

Selected professional opportunities in repertory and commercial theatre, designed to engage the student in particular creative responsibilities under the guidance of master artist-teachers.

**230. Acting Process III: Actors' Studio (3)**

An advanced studio for graduate actors and directors, this work will explore a single text from the modern theatre under the direction of a master teacher-artist. Concentration will be on multiple possible modes of encountering a text, varieties of interpretation and performance realization, and the development of a theatre ensemble.

**231. Survival Seminar (1-3)**

An advanced seminar that focuses on the grimmer realities that bridge between the theatre artist and the theatre, including a study of unions, relations with agents and managers, contracts and taxation, auditioning, interviewing, and various methods of professional development. Particular attention will be given to generation of a broad understanding of the company to enter into participation in the professional theatre.

**233. Acting for the Camera (1)**

This course is designed to aid the actor in the transition from stage to film work. Examination of film production and its physical characteristics and the acting style needed for work in film and television. Students will rehearse and perform in simulated studio setting.

**234. Voice for Theatre III (1-2)**

A one-quarter course devoted exclusively to intensive development of the actor's vocal capability to master a variety of musical theatre scores. Concentration on extending the vocal range, sight reading, textual and musical analysis, and musical characterization.

**236. Actor's Recital (1-3)**

A course designed to allow for the careful and thorough selection, rehearsal, and performance of an actor's recital, composed of material ranging from the classical to the contemporary theatre, and determined by the particular artistic interests and capabilities of the performer.

**237. Teatro Seminar (2)**

An ongoing seminar devoted to playwrights, theatre companies, and other individuals involved in Hispanic American theatre. Topics will vary each quarter and will address issues important to the development of Hispanic theatre.

**238. Speech for the Actor III (1)**

Continuing advanced work in phonetics and articulation. Intensive study of stage dialects to prepare actor for variety of roles.

**239. Movement for Theatre III (1)**

An advanced course in the art of movement for the theatre, building on the knowledge gained in Theatre 223A and B.

**240. Directing Seminar (0-4)**

A seminar focusing on the current directing projects of all graduate directing students. Depending upon individual student needs, the work may include play selection, historical or sociological research, and discussion of emerging directorial concepts, the rehearsal process, and post-production evaluation. *Prerequisite: graduate standing.*

**244. Dramatic Structure (4)**

Analysis of fundamentals of dramatic structure: plotting, thematic structure, structure of action at the level of scene. Study of well-structured plays in several styles. Practical exercises in constructing plays effectively, along with theoretical considerations.

**250. Playwriting Seminar (4)**

A seminar focusing on the current playwriting project of all graduate playwriting students. Work for each quarter is individually determined according to student needs, but may include exploration of an inception idea, development of a scenario or other structural work, and writing dialogue. Students present work to be discussed in class. May include

group or individual playwriting exercises. *Prerequisite: graduate standing.*

#### **251. Playwriting Practicum (3-6)**

Creative writing project developing original scripts from outline to the final play. Plays may vary depending on the quarter, but will include writing of a realistic one-act, a nonrealistic one-act, a one-act documentary or dramatization of fiction, a full-length play. *Prerequisite: graduate standing.*

#### **252. Dramaturgy Seminar (2-3)**

The seminar will deal with all dramaturgical issues pertaining to departmental productions: production research, textual analysis, translation, adaptation, rehearsal process, and critique. Concurrently with the dramaturgy issues of the given year, the seminar will discuss possible choices of plays for future production seasons.

#### **253. Dramaturgy Practicum (2-4-6)**

Students enrolled in this course will work on productions in the function of a dramaturg. This will entail preparation of texts, research, participation at rehearsals, etc. *Prerequisite: graduate standing.*

#### **254. Topics in Dramaturgy (4)**

Lecture/discussion course focusing on dramaturgical process and method in world theatre. Emphasis will be placed on developing an understanding of the dramaturg's function with regard to interpreting classic works of dramatic literature and to developing new plays for the contemporary theatre.

#### **255. Restaging the Classics (4)**

A series of detailed dramaturgic and scenographic examinations of influential reinterpretations of classic dramatic texts. The seminar will investigate selected texts from the dual perspectives of historic and contemporary theatre practice. *Prerequisite: graduate standing.*

#### **256. Contemporary Plays (2)**

A guided reading course focusing exclusively on very recent plays in an attempt to become aware of what is being written now. Plays chosen will be primarily American. Course may be repeated for credit.

#### **257. Screenwriting (4)**

Students will develop the concept for an original piece for television or film and will write the screenplay. Student work will be discussed in seminar at each phase of the development. *Prerequisites: graduate standing and 250.*

#### **258. Dramatization and Adaptation (4)**

Seminar will deal with dramatization and adaptation of literary texts for the purpose of theatrical production. The class will study some significant examples of such practice from the past, and, subsequently, students will develop their own projects of dramatization, adaptation, or modernization of texts. *Prerequisite: graduate standing.*

#### **259. Critical Writing (4)**

An examination and analysis of published articles in the field of contemporary American theatre and the writing of an article for potential publication which documents and analyzes a theatre piece. *Prerequisite: graduate standing.*

#### **260. Theatrical Modernism: Nineteenth to Twentieth Century (2-3)**

Topics to be covered include: radicalism of realism; symbolist theatre and the origins of the avant-garde; the new director as an artist; new structures of representation; painters and the modern theatre; from modernism to post-modernism. *Prerequisite: graduate standing.*

#### **268. Latin American Dramatic Literature (4)**

This seminar will focus on representative contemporary Latin American plays in Spanish as well as in English

translation. Students will analyze the plays and dramatists from the perspective of a dynamic social, cultural, and political process. *Prerequisite: graduate standing.*

#### **270A-B-C. Design Studio I: (4-4-4)**

This course will focus on beginning-level problems in theatre design, including text analysis, research, conceptualization, and visual expression. Students will work on individual projects in lighting, costume, and scenic design. The course will include group critiques of completed designs and works in progress. 270A: Scenic Design; 270B: Costume Design; 270C: Lighting Design. *Prerequisite: graduate standing.*

#### **271. Advanced Design Studio III (1-6)**

Ongoing work on individual projects for all graduate students in design with group critiques of completed designs and works in-progress. To be repeated each quarter of the graduate student's third-year residence.

#### **272. Portfolio Studio (1-4)**

This course evaluates current portfolio progress of graduate students in their third year of training. Creative projects in class designed to augment the individual student portfolios. Class culminates in final exhibition of student portfolio in combination with student's thesis production. *Prerequisite: graduate standing.*

#### **273. Theatre Production: Design (1-4)**

Intensive involvement in UCSD theatre productions in the role of designer or design assistant, including collaboration with director from dramatic text to production. The course will serve as the creative laboratory for M.F.A. students specializing in theatre design. *Prerequisite: graduate standing.*

#### **274. Intermediate and Advanced Scene Design (4)**

This course explores intermediate and advanced problems in scenic design through creative projects and works in progress. *Prerequisite: graduate standing.*

#### **275. Intermediate and Advanced Lighting Design (4)**

This course explores intermediate and advanced problems in lighting design. Creative projects are focus of class work, with special emphasis on works in progress. *Prerequisite: graduate standing.*

#### **276. Intermediate-Advanced Costume Design (4)**

Projects in costume design, emphasizing script analysis, research, conceptualization, and visual expression. Studio work includes costume rendering in various media for specific plays.

#### **277. Fabric Painting and Dyeing for the Theatre (4)**

Studies in the surface treatment of fabric for theatre costume, includes textile design techniques of batik, silk-screen, blockprint, aging and distressing of costumes in addition to discussion of dye theory and pigment application. Class will include lecture, demonstration, and individual studio projects. *Prerequisite: graduate standing.*

#### **278. Special Topics in Theatre Design: (4)**

A course designed to expose the theatre design student to a variety of specialized topics, including millinery, pattern drafting and draping, scenic painting, model making, figure drawing, drafting, fitting, rendering. Topics will vary from quarter to quarter. *Prerequisite: graduate standing.*

#### **280. Stage Management (1-4)**

Discussion and research into the duties, responsibilities, and roles of a stage manager. Work to include studies in script analysis, communication, rehearsal procedures, performance skills, and style and concept approach to theatre. *Prerequisite: graduate standing.*

#### **281. Stage Management 2 (4)**

A continuation of the introductory stage management course, to further explore the stage manager's process, focusing on the technical rehearsal period through the closing of a show. *Prerequisites: graduate standing and 280.*

#### **282. Technical Production for Theatre Administrators (1-4)**

A course for all theatre administration students aimed at developing knowledge and skill in the function and process of scenery, costume, and lighting workshops. Weekly projects will acquaint students with specific aspects of various workshops. *Prerequisite: graduate standing.*

#### **283. Design Workshop: Costume, Lighting, Scenery (1-4)**

For all first-year M.F.A. students in theatre administration. Course will vary from year to year, always focusing on the development of knowledge and awareness of design in the production process. Each term, the student will study one aspect of design, e.g., scenery, through class work or production projects. *Prerequisite: graduate standing.*

#### **284A. Nonprofit Theatre Structure (4)**

A thorough examination of the structure of the not-for-profit theatre. Topics will include the artistic mandate, theatrical staff and hierarchy, budgets, implementing artistic vision, the board of trustees, and long- and short-term planning. *Prerequisite: first- or second-year graduate standing.*

#### **284B. The Commercial Theatre Structure (4)**

An analysis of commercial theatre. Topics include historical perspectives, relationship with not-for-profit theatre, general and limited partnerships, artistic vision, fundraising, and prospecti. *Prerequisite: second- and third-year graduate standing.*

#### **285A. Advanced Stage Management: Problems (4)**

A seminar that focuses on the various problems encountered in stage managing. Topics include relationships with collaborative artists and staff, rehearsal period, paperwork, psychology of performers, and professional guidelines. *Prerequisite: first- or second-year graduate standing.*

#### **285B. Advanced Stage Management: Venues (4)**

A seminar that approaches each venue in which the stage manager works as a discreet entity. Topics include rotating repertory, television, stock, and touring. *Prerequisite: first- or second-year graduate standing.*

#### **285C. Advanced Stage Management: Musicals/Dance (4)**

A seminar that focuses on methodologies and strategies used in stage managing musicals, opera, and dance, tracing the involvement from preproduction to closing.

#### **286. Special Topics in Stage Management (1-4)**

A course for second-year M.F.A. students in stage management. Topics will vary from quarter to quarter, focusing on various aspects of theatre administration and stage management. *Prerequisite: graduate standing.*

#### **287. Production Management (4)**

Course follows the operation of a theatre production manager, including long-range scheduling, technical design management skills, hiring and contracts procedures, budget allocations, accounting considerations, and critical analysis.

#### **288. Stage Management Seminar (4)**

A weekly seminar in which all graduate stage managers participate. Includes discussions of problems encountered on current productions, paperwork, methodology, and production approaches. *Prerequisite: graduate standing.*

#### **289. Theatre Development (4)**

An in-depth analysis of strategies and techniques utilized in developing financial resources in the not-for-profit theatre.

Class includes focus on topics such as grant writing, fundraising, capital drives, government and corporate funding, and development strategies. *Prerequisite: second-year graduate standing.*

**290. Business Problems (4)**

Each term the course will focus on a number of business problems in the theatre. Topics include contracts, unions, negotiations, insurance, accounting techniques, and box office management.

**291. Theatre Marketing (4)**

An in-depth approach to marketing techniques and strategies. Topics include advertising, box office, front of house, telemarketing, and budgeting. *Prerequisite: first- or second-year graduate standing.*

**296. Stage Management Practicum (4-12)**

Taken in the final term by second-year stage management students. Course focusing on the development of knowledge and skills of contemporary examples of stage management. *Prerequisite: graduate standing.*

**297. Thesis Research (2-8)**

Thesis research for M.F.A. degree. (S/U grades only.)

**298. Special Projects (0-4)**

Advanced seminar and research projects in theatre. (S/U grades only.)

**299. Thesis Project (2-8)**

Specific projects in theatre individually determined to meet the developing needs, interests, and abilities of M.F.A. candidates. (S/U grades only.)

**500. Apprentice Teaching (2)**

This course, designed to meet the needs of the graduate students who serve as teaching assistants, includes analysis of texts and materials, discussion of teaching techniques, conducting discussion sections, formulation of topics and questions for papers and examinations, and grading papers and examinations under the supervision of the instructor assigned to the course. Participation in the undergraduate teaching program is required for the M.F.A. degree. The amount of teaching required is equivalent to the duties expected of a 25 percent teaching assistant for one quarter. Enrollment for two units in this course documents the requirement.

**501. Teaching in the Humanities (4)**

Consideration of pedagogical applications to teaching of literary, historical, and philosophical texts at the undergraduate level. Pedagogical aids for the teaching of composition and supervised teaching in sections of the undergraduate humanities sequence. *Prerequisite: graduate standing.*

nar upon entry in fall quarter. The seminar provides a forum to introduce our best students to the excitement of pioneering research and innovative scholarship in all disciplines at UCSD.

Other highlights of the general honors program include a quarterly Speakers' Forum, which brings together faculty and honors students for informal presentations on recent research or current events in all fields facilitated by faculty and other prominent persons. The quarterly Provost's Chat provides a relaxed and friendly atmosphere to directly discuss items of interest to honors students with the provost of the college. Third College recognizes superior achievement each year with an Honors Recognition Celebration for outstanding scholastic performance and with the Provost Award at graduation for outstanding academic achievement and breadth of scholarship. The potential for Phi Beta Kappa membership, departmental honors programs, small honors classes in science and mathematics, and University Honors at graduation all add to the challenge of honors education at Third College and UCSD.

**Courses**

**10. Third College Methods of Inquiry (2)**

In this course, students learn analytical thinking strategies routinely used by professional scholars. Each student applies the strategies to the materials presented in lectures and reading assignments and to his or her current course work. *Prerequisite: none. (P/NP only.)*

**20. Third College Freshman Honors Seminar (0)**

Weekly one-hour seminars conducted by distinguished UCSD faculty in a wide variety of disciplines. Students will gain insight into pioneering research and contemporary developments in the sciences, social sciences, humanities, and fine arts at UCSD. *Prerequisite: by invitation only. Pass/Not Pass grades only. (F)*

**90. Undergraduate Seminar (1)**

These seminars are designed to expose undergraduate students, especially freshmen and sophomores, to exciting research conducted by UCSD faculty. *Prerequisite: none. (P/NP only.)*

**Associate Professors**

- Robert Cancel, Ph.D., *African and Caribbean Literature, Coordinator of Third World Studies*
- Ann L. Craig, Ph.D., *Political Science*
- Michael P. Monteon, Ph.D., *Latin American History*
- Vicente L. Rafael, Ph.D., *Communication: Southeast Asian and Philippine Culture*
- Marta E. Sanchez, Ph.D., *Latin American Literature*
- Rosaura Sanchez, Ph.D., *Spanish and Latin American Literature, Linguistics*
- William Tay, Ph.D., *Chinese Literature*
- Carlos Waisman, Ph.D., *Sociology*

**Assistant Professor**

- Suzanne Brenner, Ph.D., *Anthropology*

**Adjunct Professor**

- Leften S. Stavrianos, Ph.D., *History*

The Third World Studies Program has three main objectives:

1. To provide an understanding of the Third World and its relationships to the West. In order to understand these relationships, it is necessary to study the historical context out of which the present relationships developed. For example, besides trying to understand what kind of society existed in Meso-America when the Spaniards arrived in 1520, the student must also have an understanding of the historical development in Europe which resulted in Spain's decision to seek wider trade abroad. There is insistence on both the similarities and differences which Third World societies have among themselves and the similarities and differences with Western societies.
2. To provide an interdisciplinary approach to the study of the Third World. The program is not conceived as being exclusively historically oriented nor as being predominantly a social science program, but rather one that integrates both the social sciences and the humanities.
3. To provide an understanding of the relationship between Third World groups within the United States (Asian-American, Afro-American, Chicano, and Native American) and Third World societies (African, Asian, and Latin American) through a comparative approach. Third World societies are compared as they existed before contact with the West, in the various colonial relationships with the West, and in their evolution after independence.

**THE MAJOR PROGRAM**

Students interested in Third World studies may choose either an interdisciplinary major with a disciplinary focus (anthropology, economics,



**THIRD COLLEGE**

**HONORS PROGRAM**

OFFICE: Provost, Third College, Administration Building

The Third College Honors Program provides exceptional students at Third College the organization and environment within which to pursue individual excellence. Participation in the Third College Honors Program entitles high-achieving students to enroll in the Freshman Honors Semi-

**THIRD WORLD STUDIES**

OFFICE: Literature Building, Rm. 3410, Warren College

**Professors**

- Carlos Blanco-Aguinaga, Ph.D., *Spanish and Latin American Literature*
- Jaime Concha, Ph.D., *Spanish and Latin American Literature*
- Edward Reynolds, Ph.D., *African History*

## THIRD WORLD STUDIES

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history, literature, political science, sociology, etc.) or a specific departmental major within the humanities or social sciences.

A Third World studies major requires a minimum of *twelve* upper-division courses plus *three* lower-division courses from one of the Third World studies sequences (TWS 21, 22, 23; TWS 24, 25, 26; HILD 1A-B-C; or HILD 10-11-12). Selection of a specific concentration, discipline, or department should be determined in consultation with a Third World studies faculty member or program adviser.

### DOUBLE MAJOR

Students interested in Third World studies as a double major must have *eight* upper-division courses beyond their departmental major requirements. These eight may cover one or more disciplines. Courses may focus on a theme or problem or on a geo-historical area. The remaining four courses may overlap with the other major requirements. Students should consult a Third World studies faculty member or program adviser for approval of a major program.

### MINOR

A student may minor in Third World studies by selecting a lower-division Third World studies sequence (TWS 21, 22, 23 or TWS 24, 25, 26) and three upper-division courses in disciplines dealing with the Third World.

Third World studies faculty members offer courses in the Departments of Anthropology, Communication, Literature, Political Science, Sociology, History, and in the Third World Studies Program. Appropriate courses in other departments may also be considered. Students should consult departmental and program listings for Third World area offerings.

## Courses

See listings also under the Departments of Anthropology, Communication, History, Literature, Political Science, and Sociology for other Third World area offerings.

### LOWER DIVISION

#### 14. Politics and the Third World Poor (4)

(Same as Political Science 14.) This course explores the context, structure, purpose, and fate of collective political action by the urban and rural poor in Latin America, Asia, and Africa. It examines local as well as national political organizations and their economic, social, and cultural foundations.

#### 21-22-23. Third World Literatures (4-4-4)

An introduction to the cultures of various Third World countries through close reading of selected literary texts. TWS 21 fo-

cuses on African literature. TWS 22 deals with Latin American literature and TWS 23 examines Chinese literature. Topics will vary each quarter. (F,W,S)

#### 24. Origins and Consequences of Underdevelopment (4)

(Same as HILD 4A.) The history of the Third World peoples of Asia, Africa, and Latin America is surveyed from the fifteenth century to 1900. It traces the origins of European empires, the interrelationships between these empires and the process of underdevelopment, the meaning of imperialism as an experience shared by Third World peoples, and the beginning of indigenous resistance to imperialism.

#### 25. China and the West in Modern Times (4)

(Same as HILD 4B.) This course surveys the eighteenth-, nineteenth-, and early twentieth-century history of China. Special emphasis is placed on the nature of the various Chinese responses to the political, economic, and cultural impact of the West on traditional Chinese society. (W)

#### 26. Third World: Nationalist Rebellions and Economic Development (4)

(Same as HILD 4C.) The course surveys the attempts of nationalist movements to seize power in Africa, Asia and Latin America, and to then design economic programs capable of simultaneously fomenting growth and a more equitable distribution of income. The means by which such movements take power will take up the first part of the course; the second part is devoted to their economic problems. The revolutions in China, Cuba, Vietnam, Kenya, and Chile are among the cases that will be examined in detail. (S)

### UPPER DIVISION

#### 132. Literature and Third World Societies (4)

This course will investigate novelistic and dramatic treatments of European society in the era of nineteenth-century imperialism, Third World societies under the impact of colonialism, and the position of national minorities inside the United States to the present day. Attention will center on the interplay between the aesthetic merits and social-historical-philosophical content of the works read.

#### 135. Bilingualism: Research and Field Studies (4)

A study of sociolinguistic findings on bilingualism throughout the world and an evaluation of bilingual education theories. The students will also engage in surveys of local communities to assess bilingualism and educational needs of bilingual communities. *Prerequisite: upper-division standing.*

#### 190. Undergraduate Seminars (4)

Seminars will be organized on the basis of topics with readings, discussions, and papers. Specific subjects to be covered will change each quarter depending on particular interest of instructors or students. May be repeated for credit.

#### 197. Field Work (4)

In an attempt to explore and study some unique processes and aspects of community life, students will engage in research in field settings. Topics to be researched may vary, but in each case the course will provide skills for carrying out these studies.

#### 198. Directed Group Studies (2 or 4)

Directed group study on a topic or in a field not included in the regular department curriculum, by special arrangement with a faculty member. *Prerequisite: upper-division standing.*

#### 199. Independent Study (2 or 4)

Tutorial, individual guided reading and research projects (to be arranged between student and instructor) in an area not normally covered in courses currently being offered in the department. (P/NP grades only.) *Prerequisites: upper-division standing and consent of instructor.* (F,W,S)

Third World Studies offerings in other departments:

### ■ ANTHROPOLOGY

- 102. Latin American Societies and Culture
- 103. Chinese Popular Religion
- 104. Traditional African Societies and Culture
- 108. Peasant Organization and Conflict
- 109. Chinese Familism
- 112. Femininity and Masculinity in Japan
- 122. Japanese Psychology and Psychotherapies
- 125. Contemporary Central America
- 134. The Cultures of Mexico
- 135. Indian Society
- 136. Culture and Personality in China
- 137. Societies and Cultures of Melanesia
- 144. Traditional Chinese Society
- 145. Topics in Latin American Societies and Cultures
- 146. Everyday Religiosity in Japan
- 149. Hinduism
- 152. Gandhi: The Man and His Society
- 162. Peoples of the Near East
- 166. Family and Society in the Near East
- 170. Language and Culture in Asia

### ■ COMMUNICATION

Com/Cul 181. Colonialism and Culture

### ■ HISTORY

- HILA 100. Colonial Latin America: Era of Conquest
- HILA 101. Colonial Latin America: The Mature Colonies
- HILA 102. Latin America in the Twentieth Century
- HILA 110. Progress and Poverty in South America: 1820-1930
- HILA 111. Progress and Poverty in South America: 1930-Present
- HILA 112. Economic and Social History of the Andean Region
- HILA 113. Lord and Peasants in Latin America
- HILA 114. Social History of Colonial Latin America
- HILA 115. The Latin American City: A History
- HILA 120. History of Argentina
- HILA 121. History of Brazil
- HILA 122. Cuba: From Colony to Socialist Republic
- HILA 131. A History of Mexico
- HILA 132. A History of Contemporary Mexico
- HILA 160. Topics in Latin American Colonial History, 1500-1820
- HILA 161. History of Women in Latin America
- HILA 162. Special Topics in Latin American History
- HILA 164. Political Economy of Argentina
- HILA 166. Colloquium—Cuba: From Colony to Socialist Republic
- HILA 172. Machismo and Matriarchy: Latin American Social Structure
- HIAF 110. History of Africa to 1880
- HIAF 111. Modern Africa since 1880
- HIAF 120. History of South Africa
- HIAF 130. African Society and the Slave Trade



- HIAF 140. Economic History of Africa  
 HIAF 160. Special Topics in the Economic History of Africa  
 HIAF 161. Special Topics in African History  
 HIEA 130. History of the Modern Chinese Revolution: 1800-1911  
 HIEA 131. History of the Modern Chinese Revolution: 1911-1949  
 HIEA 132. History of the People's Republic of China  
 HIEA 163. Cinema and Society in Twentieth-Century China  
 HIEA 165. The Chinese Village in Transition: 1930-1956

■ **LITERATURE**

**General**

130. Novel and History in the Third World  
 132. Introduction to African Oral Literature  
 133. Introduction to Literature and Film of Modern Africa  
 135. Contemporary Caribbean Literature  
 136. Latin American Literature in Translation  
 137. Mexican Literature in Translation  
 140A. Classical Chinese Literature  
 140B. Modern Chinese Literature  
 140C. Contemporary Chinese Literature  
 142A-E. Earlier Japanese Literature  
 143A-E. Later Japanese Literature  
 145. Topics/Japanese Literature  
 146. Japanese Works/Authors

**Spanish**

- 130B. Development of Latin American Literature  
 131. Spanish American Literature: The Colonial Period  
 132. Spanish American Literature: Nineteenth Century  
 133. Spanish American Literature: Twentieth Century  
 134. Argentine Literature  
 135. Mexican Literature  
 136. Peruvian Literature  
 137. Caribbean Literature  
 140. Spanish-American Novel  
 141. Spanish-American Poetry  
 142. Spanish-American Short Story  
 143. Spanish-American Essay  
 144. Spanish-American Theatre  
 160. Spanish Phonetics  
 163. Spanish Language in America  
 172. Indigenista Themes in Spanish-American Literature  
 173. Spanish American Literary History

■ **MUSIC**

126. Introduction to Oral Music

■ **PHILOSOPHY**

152. Philosophy and Literature

■ **POLITICAL SCIENCE**

- 112B. Politics, Philosophy, and Social Science Methodology  
 130B. Politics in the People's Republic of China

- 130D. Seminar: Chinese Politics  
 130G. Vietnam: The Politics of the Village  
 130H. Vietnam: The Politics of Intervention  
 133A. Introduction of Japanese Politics  
 133B. Political Economy of the East Asian Newly Industrialized Countries  
 133D. Japanese Foreign Policy  
 133E. Public Policy in Japan  
 134AA-AB. Comparative Politics of Latin America  
 134B. Politics in Mexico  
 134C. Peasant Movements and Agrarian Problems in Latin America  
 134D. Selected Topics in Latin American Politics  
 134G. Politics in the Andes  
 134I. Politics in the Southern Cone of Latin America  
 134J. Labor and Politics in Latin America  
 134N. Politics in Central America  
 135A. Ethnic Conflict in the Third World  
 136A. African Politics  
 138A. The Political Economy of Urbanization  
 138B. Politics in Rural Inequality  
 144AA-AB. Politics in the International Economic Order  
 144B. Comparative Responses to International Economic Crises  
 144D. Political Dimensions of International Finance  
 145B. Conflict and Cooperation in International Politics  
 146A. The U.S. and Latin America: Political and Economic Relations  
 146BA-BB. Seminar on Mexico and U.S.-Mexican Relations  
 146C. U.S.-Latin American Relations and the International Political Economy  
 146D. Political Parties in Latin America  
 150A. Seminar: The Political Economy of International Labor Migration  
 196A-B-C. Fieldwork in U.S.-Mexican Studies

■ **SOCIOLOGY**

146. Social Stratification  
 151. Comparative Race and Ethnic Relations  
 185. Political Economy of Development and Underdevelopment  
 187. African Society through Film  
 188A. Community and Social Change in Africa  
 188B. Chinese Society  
 188C. Social Change in Modern India  
 188D. Latin America: Society and Politics

Students wishing to include additional related courses from these and other departments should consult a Third World studies adviser.

**Professors**

- Robert F. Engle, Ph.D., *Economics*  
 Ramon A. Gutierrez, Ph.D., *Ethnic Studies/History*  
 Robert M. Kaplan, Ph.D., *Community and Family Medicine*  
 George Lipsitz, Ph.D., *Ethnic Studies*  
 Hugh G. Mehan, Ph.D., *Sociology/Teacher Education Program*  
 Michael E. Parrish, Ph.D., *History*

**Associate Professors**

- Rae L. Blumberg, Ph.D., *Sociology*  
 Amy Bridges, Ph.D., *Political Science*,  
*Coordinator of Urban Studies and Planning*  
 Steven P. Erie, Ph.D., *Political Science*  
 Ivan T. Evans, Ph.D., *Sociology*

**Assistant Professors**

- William F. Deverell, Ph.D., *History*  
 Richard G. Kronick, Ph.D., *Community and Family Medicine*  
 Marcelo Suarez-Orozco, Ph.D., *Anthropology*

**Director of Field Studies**

- Keith Pezzoli, Ph.D.

**Lecturer**

- Barbara L. Brody, M.P.H., *Community and Family Medicine*

**Visiting Faculty**

- Nico Calavita, D.Arch.  
 Thomas Crandall, M.S.  
 Joseph Martinez, M.Arch.

**THE URBAN STUDIES AND PLANNING PROGRAM**

The great majority of U.S. citizens, and a growing proportion of people throughout the world, live in cities. Cities provide the environment in which people work, learn, play, and make decisions together. Local governments make critical interventions in the quality of life. At the same time, the cities of the world are increasingly linked in a global economic system, making diverse contributions to the international division of labor.

Urban studies and planning is an interdisciplinary program providing students with a variety of perspectives for understanding the development, growth, and culture of cities and the communities within them. Course work introduces students to the ways different social science disciplines understand cities and the societies of which they are a part. Upper-division requirements educate students about the parameters within which urban choices are made. Upper-division electives broaden students' social education and introduce students to policy and plan-

▼ **U**RBAN STUDIES AND PLANNING

226 Cognitive Science Building

ning issues. The upper-division field studies sequence allows students to develop and carry out an original research project. This forms the basis for the senior paper, written in the spring quarter of the senior year.

Urban studies and planning provides an undergraduate community of students with diverse interests and goals. After graduation some majors pursue graduate work in social science disciplines. Others pursue graduate study in public policy, law, planning, architecture, or design. Urban studies has always also attracted students interested in medicine and public health issues, who continue to study in these areas at schools of medicine or public health. Urban studies and planning is not designed as a training program in local government, planning, or design. It provides students with a solid liberal arts background for graduate study or for professional work in a number of fields. Many students find employment opportunities through their field work placement. More generally, graduates of urban studies and planning will have the analytic skills to think clearly and act creatively about the problems and prospects of the urban environment.

## THE URBAN STUDIES AND PLANNING MAJOR

A bachelor of arts degree in urban studies and planning will be given to students who satisfactorily complete the general-education requirements of Muir, Revelle, Third, Warren, or Fifth College in addition to the urban studies and planning courses described below.

The undergraduate program in urban studies and planning requires a three-quarter lower-division sequence in urban studies; two courses in lower-division economics; Social Science 60; and twelve courses in upper-division urban studies and planning. *Students are encouraged to complete the lower-division prerequisites before they enroll in the upper-division courses.*

In accordance with campus academic regulations, courses used to satisfy the major cannot be applied toward a minor, although some overlap is allowed for double majors. Students may elect to take the lower-division economics prerequisites on a Pass/No Pass basis. All other lower-division and upper-division requirements must be taken for a letter grade. A 2.0 grade-point average is required for all courses in the major. Transfer students should see an urban studies and planning adviser to determine whether courses taken elsewhere satisfy USP program requirements.

## LOWER-DIVISION REQUIREMENTS

Students majoring in urban studies and planning must complete the introductory sequence USP 1, 2, and 3. In addition, they must complete either Economics 1A-B or Economics 2A-B, and Social Science 60.

## UPPER-DIVISION REQUIREMENTS

The upper-division requirements in urban studies and planning are:

1. three foundation courses
2. three social science courses
3. three policy and planning courses
4. senior sequence of field work, internship, and senior seminar

### Foundation Courses

Foundation courses provide the conceptual tools for the major. Students are to choose three of:

- USP 102. Urban Economics (Economics 135) (4)
- USP 103. U.S. Cities in the Twentieth Century (HIUS 148) (4)
- USP 107. Urban Politics (Political Science 102E) (4)
- USP 131. Community Dynamics and Ethnicity (4)

### Senior Sequence Requirement

In their senior year, all students must take the senior sequence of field work, internship, and seminar. These courses must be taken IN ORDER. Students will not be allowed to register for the internship without having taken the field work course. Students are required to take six units of urban fieldwork seminar (USP 186) and six units of internships (USP 187) under the direction of the field studies instructor.

N.B.: Because USP 187 is an internship, no other internship or field placement (e.g., TEP 181) will be counted towards the major.

**USP 186. Urban Fieldwork Seminar (6)**

**USP 187. Urban Studies Internship (6)**

Students must take the senior seminar (USP 190) as a graduation requirement. In this seminar, students will complete a substantial research paper based upon their fieldwork and internship experience.

**USP 190. Senior Seminar (4)**

## Social Science Requirement

Students must choose three courses to complete their upper-division social science requirement. Courses accepted for this requirement include:

**USP 118. Poverty in Urban America**

**USP 132. Race and Ethnic Relations in Urban America**

**USP 150. Black Ghetto**

**USP 160. Western Environmental History**

**Communications/SF 128. Information Technology: Culture, Society, Politics**

**Communication/SF 147. Information Technology and Global Production**

**Economics 116. Economic Development**

**Economics 130. Public Policy**

**Economics 134. Regional Economics**

**Economics 139. Labor Economics**

**Economics 150. Economics of the Public Sector: Taxation**

**Economics 151. Economics of the Public Sector: Expenditures**

**Economics 152. Topics in Public Economics**

**Economics 155. Economics of Voting and Public Choice**

**Economics 179. Decisions in the Public Sector**

**Ethnic Studies 102. Racial Inequality in America: A Comparative Historical Analysis**

**Ethnic Studies 121. Contemporary Asian-American History**

**Ethnic Studies 131. Social and Economic History of the Southwest II**

**Ethnic Studies 151. Ethnic Politics in America**

**Ethnic Studies 182. Segregation, Freedom Movements, and the Crisis of the Twentieth Century**

**Ethnic Studies 190. Research Methods: Studying Racial and Ethnic Communities**

**History 114. California History**

**History (HILA) 115. Latin American City, a History**

**Political Science 100G. American Politics and Public Policy**

**Political Science 100H. Race and Ethnicity in American Politics**

**Political Science 102J. Advanced Topics in City Politics**

**Political Science 103A. California Government and Politics**

**Political Science 106A. Politics and Bureaucracy**

**Political Science 138. Political Economy of Urbanization**

**Political Science 160AB. Introduction to Policy Analysis**

**Psychology 104. Introduction to Social Psychology**

**Sociology 100. Classical Sociological Theory**

**Sociology 121. Economy and Society**

**Sociology 122. Sociology of Organization**

**Sociology 123. Sociology of Work**

**Sociology 124. Occupations and Professions**

**Sociology 136B. Sociology of Mental Illness: In Contemporary Society**

**Sociology 140. Sociology of Law**

**Sociology 141. Crime and Society**

**Sociology 144. Forms of Social Control**

**Sociology 148. Political Sociology**

**Sociology 148I. Collective Identity and Group Formation**

**Courses**

**LOWER DIVISION**

- Sociology 149. Theory of Social Problems
- Sociology 150. Equality and Inequality
- Sociology 151. Comparative Race and Ethnic Relations
- Sociology 153. Urban Underclass
- Sociology 148E. Ethnicity and Politics
- Sociology 159. Special Topics in the Sociology of Organizations and Institutions
- Sociology 179. Social Change
- Sociology 180. Social Movements and Social Protest

**Policy and Planning Requirement**

Students must choose three courses to fulfill their upper-division policy and planning requirement. Courses accepted for this requirement include:

- USP 105. Border Planning
- USP 106. Valencia Park Elementary
- USP 115. Urban Transportation Planning
- USP 117. Technology of Cities
- USP 123. Housing Policy
- USP 124. Land Use Planning
- USP 125. Topics in Urban Planning
- USP 143. U.S. Health Care System
- USP 144. Environmental and Preventive Health Issues
- USP 145. Aging—Social and Health Policy Issues
- USP 147. Case Studies in Health Care Programs/Poor and Underserved Populations
- USP 170. Planning Theory & Practice
- USP 173. History of Urban Planning and Design
- USP 174A. Introduction of Urban Design
- USP 174B. Practice in Urban Design
- USP 175. Environmental Problems
- USP 176. Downtown Redevelopment
- USP 177. Design and Public Policy
- Anthropology 132. Conservation and the Human Predicament
- Anthropology 143. Education and Culture
- Economics 131. Economics of the Environment
- Economics 138. Economics of Health
- Philosophy 122. Bio-Medical Ethics
- Philosophy 127. Professional Ethics
- Political Science 166F. The American Welfare State
- Sociology 117. Language, Culture, and Education
- Sociology 126. Social Organization of Education
- Sociology 135. Sociology of Health and Illness
- Sociology 137. Alcohol and Society

**THE MINOR PROGRAM**

The urban studies and planning minor consists of six courses in urban studies and planning, selected with the prior approval of a faculty adviser. Students who wish to minor in urban studies may do so by taking *any three* courses from among the lower-division sequence and the foundation courses, *and three* upper-division courses from among those that serve the USP major.

**1. Comparative Urbanization (4)**

Historical and comparative survey of cities throughout the world. Ecological, social, economic, technological, and cultural determinants of city location, form, growth, and decline. Urbanization movement following the Industrial Revolution. Role of the city as a force of culture and civilization. (F)

**1W. Comparative Urbanization—Writing Practicum (6)**

A writing-intensive version of USP 10 that teaches writing and analytic skills in conjunction with the study of historical and comparative survey of cities throughout the world.

**2. Urban World System (4)**

Examines the contemporary division of labor among cities. Students in the course will study interdependence in the world system, Third World industrialization, the place of U.S. cities in the global economic order, and the post-industrial transformation of U.S. cities. Course readings will trace the effects of the creation of a world system on social groups, classes, and individuals.

**3. The City and Social Theory (4)**

An introduction to the sociological study of cities, focusing on urban society in the United States. Students in the course will examine theoretical approaches to the study of urban life; social stratification in the city; urban social and cultural systems—ethnic communities, suburbia, family life in the city, religion, art, and leisure.

**UPPER DIVISION**

**102. Urban Economics (4)**

(Same as Econ. 135.) Urban economic problems and public policies to deal with them. *Prerequisite: One introductory micro- and one introductory macro-economics course.*

**103. U.S. Cities in the Twentieth Century (4)**

(Same as HIUS 148.) This course surveys changes in U.S. cities since about 1900. Case studies of individual cities illustrate the social, political, and environmental consequences of rapid urban expansion, as well as the ways in which "urban problems" have been understood historically.

**105. Environmental and Urban Planning Problems: The U.S.-Mexico Border (4)**

Course addresses the key environmental and city planning problems facing the U.S.-Mexico border region. After establishing a historical, geographic, and demographic context for the border region, the course focuses on the following themes: comparative economic base, political systems, environmental problems (water, air pollution, sewage management), city planning issues (transportation, land use, housing, industrial development), twin cities, San Diego, and Tijuana. *Prerequisite: none. (USP 10, 11, or 12 recommended.)*

**106. Valencia Park Elementary (4)**

Urban studies and planning has a continuing relationship with Valencia Park Elementary School. Students from urban studies and planning tutor students at Valencia Park. Readings assigned in education and child development. *Prerequisite: upper-division standing.*

**107. Urban Politics (4)**

(Same as Poli. Sci. 102E.) This survey course focuses upon the following six topics: the evolution of urban politics since the mid-nineteenth century; the urban fiscal crisis; federal/urban relationships; the "new" politics; urban power structure and leadership; and selected contemporary policy issues such as downtown redevelopment, poverty, and race. *Prerequisite: Political Science 10 or consent of instructor.*

**115. Urban Transportation Planning (4)**

An introduction to the field of transportation planning in cities. Lectures will cover the history of urban transport, transport and land use models; and economic and technical discussion of the viability of specific modes of transport including buses, electric transit, private automobiles, taxis, trucks, bicycle, and pedestrian movement. *Prerequisite: upper-division standing.*

**117. The Technology of Cities I: Pollution, Water, and Wastewater Treatment (4)**

A set of lecture-discussion courses which introduce students to the environmental problems caused by urban activities, and to the economic and technological aspects of the provision of important urban services such as water, transportation, sewerage, and energy. USP 117 deals with the causes, nature and abatement of urban air and water pollution, with the provision of potable water and with the treatment and disposal of wastewater. The course will be of special interest to students wishing to pursue careers in urban public administration, physical urban planning, and applied economics. *Prerequisite: upper-division standing or consent of instructor.*

**118. Poverty in Urban America (4)**

A lecture-discussion course investigating the primary causes of poverty in urban America, the social, psychological, and political consequences for society, and the attempts, both public and private, to alleviate poverty during the past half century. *Prerequisite: none.*

**123. Housing Policy (4)**

(Same as Econ. 133.) Examines housing markets and the U.S. housing finance system. Evaluates federal and local policies and tax incentives to promote housing production, encourage homeownership, provide decent shelter for low-income families, and improve conditions in deteriorated neighborhoods. *Prerequisite: One introductory micro- and one introductory macro-economics course.*

**124. Land Use Planning (4)**

Introduction to land use planning in the United States: zoning and subdivision, regulation, growth management, farmland preservation, environmental protection, and comprehensive planning. *Prerequisite: upper-division standing or consent of instructor.*

**125. Topics in Urban Planning (4)**

Seminar on selected topics in urban planning, such as downtown redevelopment, transportation policy or planning in Third World countries. Topics to be covered will be announced at the beginning of the quarter. *Prerequisite: upper-division standing or consent of instructor.*

**131. Community Dynamics and Ethnicity (4)**

An examination of the interaction of migration and urbanization on community as a social system. Characteristics of agencies and organizations which deliver services or influence changes will be approached from the use of ethnicity as a conceptual model. *Prerequisites: USP 131L (concurrently), upper-division standing, USP major, consent of instructor. See department.*

**132. Race and Ethnic Relations in Urban America (4)**

A historical/comparative examination of the causes and consequences of minority/majority group conflicts and inequality in contemporary American society. *Prerequisite: upper-division standing or consent of instructor.*

**143. The U.S. Health Care System (4)**

This course will provide an overview of the organization of health care within the context of the community with emphasis on the political, social, and cultural influences. It is concerned with the structure, objectives, and trends of major health and health-related programs in the United States to include sponsorship, financing, training and utilization of health personnel. *Prerequisite: upper-division standing or consent of instructor. (F)*

## VISUAL ARTS

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### 144. Environmental and Preventive Health Issues (4)

This course will analyze needs of populations, highlighting current major public health problems such as chronic and communicable diseases, environmental hazards of diseases, psychiatric problems and additional diseases, new social mores affecting health maintenance, consumer health awareness and health practices, special needs of economically and socially disadvantaged populations. The focus is on selected areas of public and environmental health, namely: epidemiology, preventive services in family health, communicable and chronic disease control, and occupational health. *Prerequisite: upper-division standing or consent of instructor.* (W)

### 145. Aging—Social and Health Policy Issues (4)

This course will provide a brief introduction to the nature and problems of aging, with emphasis on socioeconomic and health status; determinants of priorities of social and health policies will be examined through analysis of the structure and organization of selected programs for the elderly. Field visits will constitute part of the course. *Prerequisites: upper-division standing, consent of instructor.* (S)

### 147. Case Studies in Health Care Programs/Poor and Underserved Populations (4)

The purpose of this course is to identify the special health needs of low income and underserved populations and to review their status of care, factors influencing the incidence of disease and health problems, and political and legislative measures related to access and the provision of care. Selected current programs and policies that address the health care needs of selected underserved populations such as working poor, inner city populations, recent immigrants, and persons with severe disabling mental illnesses will be studied. Offered in alternate years. *Prerequisite: USP 143 or consent of instructor.*

### 150. The Black Ghetto (4)

Examination of the black ghetto from about 1880 to the present. Trends in migration, the patterns of economic and social adjustment, shifts in ideology and protest, and the demand for community control are themes. *Prerequisite: consent of instructor.* See department.

### 160. Western Environmental History (4)

American settlers' interaction with the western environment. Focus on the distinction between objective environmental science and the subjective views of settlers and historians.

### 170. Planning Theory and Practice (4)

Major intellectual traditions of planning thought and practice. Historical and comparative analysis of urban planning in relation to social change. Mainstream and grassroots approaches. Impact of urban social movements in the First and Third World. *Prerequisite: upper-division standing.*

### 173. History of Urban Planning and Design (4)

The analysis of the evolution of city designs over time; study of the forces that influence the form and content of a city: why cities change; comparison of urban planning and architecture in Europe and the United States. *Prerequisite: upper-division standing.*

### 174A. Introduction to Urban Design (4)

In a structured exercise, students learn how to view San Diego as an urban designer/urban planner. Current planning projects, special geographical features, and other forces at work shaping San Diego's future design will be examined.

### 174B. Practice in Urban Design (4)

Focuses on the relationships among land programs, infrastructure, transportation issues, public open space, economic feasibility, social values, and aesthetics. Studio work addresses determining optimum building envelope relationships, site organization, ambiance, environmental chart, and user needs in selected urban areas.

### 175. Environmental Problems of Urban Studies (4)

This course examines urbanization's impact on the natural resources of California, and ways natural resources of urban

areas are being protected and planned for by government agencies. Evaluation of the current status of resource-related planning. Politics of resource protection; preserving natural areas; air and water quality issues; protecting agricultural lands and guiding the location of new development.

### 177. Urban Design as a Consequence Policy (4)

Examines some of the forces, such as transportation and environmental and housing policy, that generated the design of cities. How the city has evolved in the past, why it appears as it does today, and how it might change in the future. *Prerequisite: upper-division standing or consent of instructor.*

### 186. Urban Field Work Seminar (6)

Examines the structuring of inquiry and observation including nonobtrusive measures, interviews, and participant observations. Introduces techniques for logging data, including field notes and filing systems. The final requirements is a research proposal, on a topic chosen by the student, that can serve as the basis for his or her senior thesis. *Prerequisites: USP major/senior status.*

### 187. Urban Studies Internships (6)

Students spend ten hours per week as interns with a local public or private agency of their choice. The internships are intended to provide students with professional experience that is relevant to their career interests as well as to their senior thesis research project. *Prerequisite: USP 186.*

### 190. Senior Seminar (4)

Based upon their previous fieldwork courses and internship, students will write a substantial research paper on a current urban policy issue. The seminar will rotate from year-to-year among the faculty in urban studies and planning. *Prerequisite: USP 187.*

### 198. Directed Group Study (2-4)

Directed group study on a topic or in a field not included in the regular departmental curriculum by special arrangement with a faculty member. *Prerequisites: upper-division standing and consent of instructor.*

### 199. Independent Study (2-4)

Reading and research programs and field-study projects to be arranged between student and instructor, depending on the student's needs and the instructor's advice in terms of these needs. *Prerequisites: upper-division standing and consent of instructor.*

## VISUAL ARTS

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OFFICE: 216 Mandeville Center for the Arts

### Professors

David Antin, M.A.  
Eleanor Antin, B.A.  
Harold Cohen, Diploma of Fine Arts  
Manny Farber, *Professor Emeritus*  
Jean-Pierre Gorin, Licence de Philosophie  
Helen Mayer Harrison, M.A.  
Newton Harrison, M.F.A.  
Louis Hock, M.F.A.  
Madlyn M. Kahr, Ph.D., *Professor Emeritus*  
Allan Kaprow, M.A.  
Kim MacConnel, M.F.A.  
Patricia Patterson  
Faith Ringgold, M.A.

Jerome Rothenberg, M.A.  
Italo Scanga, M.A.  
Jehanne Teilhet-Fisk, Ph.D.

### Associate Professors

Steve Fagin, M.A.  
Jack Greenstein, Ph.D.  
Standish Lawder, Ph.D.  
Fred Lonidier, M.F.A.  
Babette Mangolte  
Sheldon Nodelman, Ph.D.  
Ernest Silva, M.F.A.  
Phel Steinmetz

### Assistant Professors

Geoffrey Batchen, Ph.D.  
Susan Smith, Ph.D.  
Adrienne von Lates, Ph.D.

### Lecturer

Claudio Fenner-Lopez, M.A.

The Department of Visual Arts offers courses in painting, drawing, sculpture, performance, computing for the arts, film, video, photography, and art history/criticism (including that of film and video). A bachelor's degree from this department provides students with a solid liberal arts background and is preparatory training for careers as artists, art historians, filmmakers, video artists, photographers, and art critics. It also provides students the initial skills required for teaching and work in museums, television, and the commercial film and photography industries.

By its composition, the Department of Visual Arts is biased in the direction of actively producing artists and critics whose presence at the center of the contemporary art world necessitates reconsideration and reevaluation of artistic productions, their information structure, and significance. Consequently, a flexible introductory program of historically based courses has been devised mainly to provide the student an opportunity to concentrate on areas involving significantly different esthetic and communication structures. A series of studio courses, in which painting and sculpture are included, is presented to bring the student into direct contact with the real contingencies compelling redistribution of esthetic attitudes and reinterpretation of genres. Because of the exploratory nature of our program, the department is prepared to emphasize new media that would traditionally be considered to have scant relation to the visual arts. Thus courses in theatrical events, linguistic structures, etc., are provided. In this context, theoretical courses with a media orientation, as in film, video, or photography, are offered also.

The Department of Visual Arts is located in the Mandeville Center for the Arts, which provides faculty offices and studio spaces for gradu-



ate students. In addition, many of the faculty have studios near the Matthews Administrative and Academic Complex, and undergraduate studio and computing courses are conducted nearby. Facilities and equipment are available to undergraduates in both the Mandeville Center and at the campus-wide Media Center, providing the opportunity to study painting, drawing, photography, 16mm film, performance, sculpture, and video. Facilities at the Media Center include black and white and color portable video camera and editing equipment, as well as black/white and color video studios. The department also has the in-house capacity to process black and white 16mm film. Additional film equipment available includes an animation stand, optical printer, and two sound-mixing studios.

The campus-wide Slide Library is located on the lower level of the Mandeville center with holdings in excess of 160,000 slides. The Mandeville Art Gallery displays a continually changing series of exhibitions, and the Mandeville Annex Gallery, located on the lower level, is directed by visual arts graduate and undergraduate students.

## THE UNDERGRADUATE PROGRAM

### COLLEGE REQUIREMENTS

The Department of Visual Arts teaches courses applicable toward the Muir and Warren general-education requirements, the Third humanities requirement, the Fifth and Revelle fine arts requirements, and the Revelle minor.

### MINOR IN VISUAL ARTS

The Department of Visual Arts offers minors in six areas of study: studio painting/drawing/sculpture, photography, European art history, Non-Western art history, media history/criticism and film/video. A minor consists of six specific courses of which at least three must be upper-division. Because the requirements differ for each minor, prospective visual arts minors should consult with the departmental adviser for a complete list of appropriate classes acceptable for the minor.

### RESIDENCY REQUIREMENTS

A minimum of 50 percent of the course work completed for the major must be taken as a registered student at UCSD.

Visual Arts 14, Nineteenth-and Twentieth-Century Art, and Visual Arts 111, Structure of Art, are required courses for transfer students.

NOTE: Rarely are transfer credits accepted toward fulfilling Group III requirements under the studio major.

### MAJOR REQUIREMENTS

All courses taken to satisfy major requirements must be taken for a letter grade, and only grades of C — or better will be accepted in the visual arts major.

### STUDIO MAJOR

The studio major is aimed at producing a theoretically based, highly productive group of artists. Lower-division courses are structured to expose students to a variety of ideas in and about the visual arts. Introductory skills are taught, but their development will occur at the upper-division level in conjunction with the student's increasing awareness of the range of theoretical possibilities in the field. The curriculum includes courses in drawing, painting, sculpture, performance, photography, video, 16mm film, many offerings in art history/criticism, as well as new courses in computing for the arts.

#### Group I: Lower-Division Foundation Level

Six courses required:

- 1 Introduction to Art Making\*
- 2 Introduction to Art Making\*
- 3 Introduction to Art Making\*
- 14 Nineteenth- and Twentieth-Century Art\*/\*\*

Choice of any two:\*

- 11 Western Art I: Prehistoric to Medieval
- 12 Western Art II: Medieval to the Present
- 13 Non-Western Art
- 84 History of Film

\*Required for all studio majors.

\*\*Required for all transfer majors.

#### Group II: Upper-Division Foundation Level

- 111 Structure of Art\*/\*\*

\*Required for all studio majors.

\*\*Required for all transfer majors.

#### Beginning Level

Four courses required (Note: Foundation level courses must be completed before taking upper-division courses). Choose four from:

- 60 Introduction to Photography
- 70 Introduction to Media
- 104A Performance
- 105A Beginning Drawing
- 106A Beginning Painting
- 107A Beginning Sculpture

NOTE: Students planning a program involving film and/or video must take VA 70, Introduction to Media.

#### Group III: Upper-Division Studio Intermediate and Advanced Level

Five courses required. Any upper-division studio courses, other than those listed under Group II, such as Intermediate Drawing, Advanced Painting, or Life Drawing satisfy these requirements. Check with department for full course listings.

#### Group IV: Upper-Division Non-Studio

Four courses required. Upper-division media history/criticism and art history/criticism courses such as Hard Look at the Movies, Renaissance Art, or Contemporary Art satisfy these requirements. Check with department for full course listings.

### ART HISTORY/CRITICISM MAJOR

The major in art history and criticism is designed both for students who desire a broadly based education in the humanities and for those who plan to pursue a career in an art-related profession. In both cases, the foundation for study is proficiency in the languages of artistic expression. Through the study of art history, students learn to treat works of art as manifestations of human belief, thought, and experience in Western and non-Western societies from prehistory to the present day. Courses in criticism review the theoretical approaches which are used to understand artistic achievement. By combining art historical and critical study, the program promotes in the student an awareness of the cultural traditions which have shaped his or her intellectual outlook and provides a framework for informed judgment on the crucial issues of meaning and expression in contemporary society.

Majors are encouraged to take relevant courses in allied disciplines such as history, communication, anthropology, and literature, and in such area programs as classics and Italian studies. In addition, students who plan to apply to graduate schools are strongly advised to develop proficiency in one or more foreign languages, as is dictated by their area of specialization.

#### Program Requirements

Twenty courses in art history and criticism are required for the attainment of the bachelor of art degree in this program. Seven of these are lower-division courses and thirteen are upper-division courses, as explained below. Students who

## VISUAL ARTS

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transfer to UCSD in their second or third year may petition to substitute courses taken at other colleges or universities for our lower-division requirements. However, they must show that the courses they have successfully completed are comparable to our own.

### **FOUNDATION LEVEL— Lower-Division** (7 courses required)

- Western Art I: Prehistoric to Medieval (VA 11)
- Western Art II: Medieval to the Present (VA 12)
- Non-Western Art (VA 13)
- Nineteenth- and Twentieth-Century Art (VA 14)
- Introduction to Photography (VA 60)
- History of Film (VA 84)
- Introduction to Art Making (VA 1 or 2 or 3)

### **ADVANCED LEVEL—Upper-Division** (13 courses required)

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### **GROUP I—Required Courses** 2 courses

These *two* courses are required for all art history and criticism majors:

- VA 111 Structure of Art
- VA 112 Art Historical Methods\*

\*Normally, VA 112 is taken during the third year after completing requirements listed under Group II-Distributional Requirement.

### **GROUP II—Distributional Requirement** (5 courses)

One course from each of the following areas:

#### **A. Criticism and Theory**

- 113A History of Criticism I
- 113B History of Criticism II
- 113C History of Criticism III

#### **B. Ancient**

- 120A Greek Art
- 120B Roman Art
- 120C Late Antique Art

#### **C. Medieval/Renaissance/Baroque**

- 122A Art of the Middle Ages
- 122B Renaissance Art
- 122C Baroque Art

#### **D. Modern**

- 124A Art of the Eighteenth Century
- 124B Art of the Nineteenth Century
- 124C Art of the Twentieth Century

#### **E. Non-Western**

- 126A African and Afro-American Art
- 126B Polynesian Art
- 126C Melanesian Art
- 126D Art of the Southwest American Indians

### **GROUP III—Area Specialization** 2 courses

Two courses in one area of specialization from the following list. At least one of these must be a seminar (indicated by \*). In seminars, students will be expected to give reports and undertake independent research.

#### **A. Criticism and Theory**

All courses listed under Group II.A.

- 113D History of Criticism IV
- 114 Art Criticism
- \*117 Narrative Structure in the Visual Arts
- 118 Landscapes, Grottos, and Fountains
- 119 Issues in the History of Architecture
- 128A Topics in Art Criticism and Theory
- \*129A Special Problems in Art Criticism and Theory

#### **B. Ancient**

- 121A Prehistoric Art
- 128B Topics in Ancient Art
- \*129B Special Problems in Ancient Art

#### **C. Medieval/Renaissance/Baroque**

- 123A Italian Art of the Early Renaissance
- 123B High Renaissance Art
- 123C Michelangelo
- \*123D The City in Italy
- 123F Castles, Cathedrals, and Cities
- 123G Art of the Age of Jan van Eyck
- 123H Images of Women in Medieval and Renaissance Art
- \*123I The Illuminated Manuscript in the Middle Ages
- \*123J Jan van Eyck
- \*123K Albrecht Dürer and the First Media Revolution
- 123L History of Prints and Printed Images
- 123M Baroque Architecture
- \*123N Baroque Masters
- 128C Topics in Medieval, Renaissance, and Baroque Art
- \*129C Special Problems in Medieval, Renaissance, and Baroque Art

#### **D. Modern**

- 125B Modernist European Painting
- 125C Matisse and Picasso
- 125D Contemporary Art
- \*125E History of Performance Art
- 125F History of Twentieth-Century Sculpture
- \*125G American Folk Art
- 128D Topics in Modern Art
- \*129D Special Problems in Modern Art

#### **E. Non-Western**

All courses listed under Group II.E.

- \*127B Western and Non-Western Rituals and Ceremonies

- \*127C Female Artists and Female Imagery
- 127D Primitivism and Exoticism in Modern Art
- 128E Topics in Non-Western Art
- \*129E Special Problems in Non-Western Art

### **GROUP IV—Electives** 4 courses

Four additional courses in art history and criticism from the following list.

All courses listed in Groups II and III, as well as courses in history and criticism of film, photography, and video:

- VA 150 History and Art of the Silent Cinema
- VA 151 History of Experimental Film
- VA 152 Film in Social Context
- VA 153 The Genre Series
- VA 154 Hard Look at the Movies
- VA 155 The Director Series
- VA 157 Video History and Criticism
- VA 158 Critical History of Twentieth-Century Photography

\*indicates seminar

## **MEDIA MAJOR**

The program is designed for students who want to become creative videomakers, filmmakers, and photographers. It combines hands-on experience of making art with practical and theoretical criticism, provides historical, social and esthetic backgrounds for the understanding of modern media, and emphasizes creativity, versatility, and intelligence over technical specializations. It should allow students to go on to more specialized graduate programs in the media arts, to seek careers in commercial film, television or photography, or to develop as independent artists.

### **FOUNDATION LEVEL— Lower-Division** (7 courses required)

#### **Group A**

- VA 1, 2, or 3 Introduction to Art Making
- VA 14 Nineteenth- and Twentieth-Century Art
- VA 84 History of Film
- Comm/Gen 20 Introduction to Communication

#### **Group B**

- VA 60 Introduction to Photography
- VA 70 Introduction to Media I (Technique/History)
- VA 71 Introduction to Media II (Theory)

A total of seven courses from Groups A and B are required. Any and all courses except VA 70, 71, and 174 can be taken simultaneously. VA 70 is prerequisite for use of the Media Center. No

further production courses can be taken until both 70 and 71 are completed.

**INTERMEDIATE LEVEL—  
Upper-Division**  
(7 courses total required)

**Group A**  
*5 courses required*

- VA 111 Structure of Art
- VA 174 Media Sketchbook

Both VA 111 and VA 174 are required and prerequisite to further study. Additionally, any three of the emphasis courses are required, but two of these must be completed before taking advanced courses. The department requires that students limit themselves to two production courses per quarter.

**Film/Video Emphasis**

- VA 172 Studio Video
- VA 173 Field Video
- VA 186 16mm Film Strategies

**Photography Emphasis**

- VA 165 Camera Techniques
- VA 167 Photo Strategies

**Group B—History, Criticism, and Theory**

*2 courses required*

- VA 150 History and Art of the Silent Cinema
- VA 151 History of Experimental Film
- VA 152 Film in Social Context
- VA 153 The Genre Series
- VA 154 Hard Look at the Movies
- VA 155 The Director Series
- VA 157 Video History and Criticism
- VA 158 Critical History of Twentieth-Century Photography

NOTE: VA 158 is required for all students with photography emphasis.

**ADVANCED LEVEL—Upper Division**  
(6 courses required)

- VA 177 Scripting and Editing Strategies
- VA 178 Experimental Media
- VA 179 Narrative Media
- VA 180 Documentary Media

All four of the above are required. Additionally, two electives must be taken. VA 178, 179 or 180 are repeatable for credit as electives, or choose two from the following list.

**Electives**

Two of the above advanced courses are required before VA 109 or 131 can be taken. The

following two courses can be taken only with the approval of the instructor and are not required:

- VA 109 Advanced Projects in Media
- VA 131 Special Projects in Media

**Film and Video Electives:**

- VA 181 Sound and Lighting
- VA 182 Advanced Editing
- VA 187 Animation
- VA 188 Optical Printing

**Photography Electives:**

- VA 166 Camera Techniques
- VA 168 Color Techniques

A total of twenty courses are required for the media major:

- 7 Foundation Level
- 7 Intermediate Level
- 6 Advanced Level

**MASTER OF FINE ARTS PROGRAM**

The program is designed to provide intensive professional training for the student who proposes to pursue a career within the field of art—including art making, criticism, theory. The scope of the UCSD program includes painting, sculpture, performance, environmental art, photography, film, video, and computer media. The program is unique in that the course of study provides for and encourages student mobility within this range of traditional and media-based components. It also offers opportunities for collaborative work.

The educational path of students is focused around their particular interests in art. The department seeks to provide an integrated and comprehensive introduction to the possibilities of contemporary art production, the intellectual structures which underlie them, and the "world view" which they entail. All art-making activities are considered serious intellectual endeavors, and all students in the program find themselves confronted by the need to develop their intellectual and critical abilities in the working out of their artistic positions. A body of theory-oriented courses is required. Therefore, we have no craft-oriented programs or facilities; nor do we have any courses in art education or art therapy. The courses offered are intended to develop in the student a coherent and informed understanding of the past and recent developments in art and art theory. The program also provides for establishing a confident grasp of contemporary technological possibilities, including those involved in film, photography, and the electronic media.

The program includes formal education in lecture and seminar courses as well as study groups and studio meetings. Course work is intended to place art making in critical and intellectual context but doesn't underestimate the central importance of the student's own work. In fact, this aspect of the student's activity is expected to be self-motivated and forms the core around which the program of study operates and makes sense.

No two students will necessarily follow the same path through the degree program, and the constitution of individual programs will depend upon the analysis of their individual needs and interests, worked out by students in collaboration with their faculty advisers.

**ADMISSION REQUIREMENTS**

**Grade-Point Average**—An overall GPA of 3.00 and a 3.50 in a student's undergraduate major is required.

**Art History**—Students are expected to have had at least six art or film criticism/history courses at the undergraduate level. Those who have a broader art history background will have a better chance of being awarded teaching assistantships. Students without this requirement can be admitted, but they will be expected to make up the six courses in excess of the seventy-two units required for the degree. If there are questions concerning this requirement, check with the department.

**Statement**—Students are required to submit an essay of approximately three pages on the direction of their work and its relationship to contemporary art. This essay should be critical in nature, refer explicitly to the student's own work, and may refer to other artists, recent events in art history, and issues in domains other than art that have bearing on the student's process, thought, and work.

**Work**—Students are asked to submit documentation of their best work in a suitable format such as slides, videotape, film, photographs, etc. These will be returned upon review of the application. It is necessary to include a self-addressed, stamped envelope for return of work.

**REGULAR UNIVERSITY  
ADMISSION POLICIES**

*Please note that no application will be processed until all required information has been received.* Students should submit applications to the graduate admissions office on or before January 15, 1993. Portfolio, statement, letters of recommendation, and official transcripts should be sent directly to the department.

## REQUIREMENTS FOR THE DEGREE

The M.F.A. is considered the terminal degree in studio work, and is a two to three-year program. The following requirements must be completed in order to receive the M.F.A.:

**Departmental Review**—This review takes place in the third or fourth quarter in residence. Students make a formal presentation of their work to a faculty committee; this includes a paper and an oral examination. This presentation is considered a departmental examination, and if at its conclusion the student's work is judged to be inadequate, the student may be dismissed regardless of GPA, or may be reviewed again in the fifth quarter.

Seventy-two units of course work, including a three-unit apprentice teaching course, are required. Students may select twenty-four of these units (six courses) from upper-division course offerings. (See listings in this catalog.) Specific information on course distribution requirements can be obtained from the department.

## THE M.F.A. FINAL PRESENTATION

**Presentation of Work**—During the last quarter in residence, each student is required to present to the public a coherent exhibition or screening of his or her work.

**Oral Examination**—A committee of three Department of Visual Arts faculty members and one tenured faculty member from another department will administer an oral examination to each student covering the student's work and its relationship to the field of art.

**Thesis**—Students are required to submit some form of written work for the M.F.A. degree. Four options are available:

1. **Catalog**—The student would design and have printed an actual catalog. This would include a critical essay of approximately 1,500 words.
2. **Critical paper**—The student would write a critical paper of 3,000 words analyzing his or her process and the relationship of his or her work to recent art history, with references to contemporary styles and specific artists.
3. **Analytical essay on some phase of art**—Students who have focused on both art production and art criticism would write a 3,000 word critical essay on any current art position. A brief discussion (750 words) of the student's work would also be included.
4. **Critical thesis**—Students whose emphasis is essentially criticism and who do not present an M.F.A. exhibition will write a forty- to fifty-page

thesis—the topic to be decided by the student and his or her adviser.

Applications and additional information can be obtained from the office of the Department of Visual Arts.

## Courses

NOTE: The following list of courses represents all visual arts offerings; not all courses are offered each year.

### LOWER DIVISION

#### 1. Introduction to Art Making (4)

An introduction to the process of art making with special reference to the generation of meaning through the juxtaposition of given elements and the interaction between such elements and their immediate and wider contexts. Materials, objects, images, and experience of everyday life will be utilized.

#### 2. Introduction to Art Making (4)

An introduction to the process of art making utilizing the transaction between people, projects, and situations includes both critical reflection on relevant aspects of avant-garde art of the last two decades (Duchamp, Cage, Rauschenberg, Gertrude Stein, conceptual art, happenings, etc.) and practical experience in a variety of artistic exercises.

#### 3. Introduction to Art Making (4)

This course will employ drawing, watercolor painting, found photographs, and verbal material to construct serial and narrative work. Art forms such as cartoon strips, illustrative manuscripts, and photojournalist works will be analyzed and used as models. Studio work will vary in size and format from small hand-made books and scrolls to large wall pieces.

#### 11. Western Art I: Prehistoric to Medieval (4)

Works of art are tools through which humanity has struggled to understand and deal with the world, with society, and with the self. This course provides an overview of the development of Western art in its principal phases from the earliest times to the twelfth century A.D. and serves as the foundation for subsequent, more detailed studies in the history of art. Visual images first appear in the cave paintings and carvings of the hunting people of Ice Age Europe—an art of astonishing power and mysterious meaning. The village cultures which subsequently developed in the Near East grew in the Bronze Age into great civilizations, urban, literate, and highly structured, which gave rise to the first monumental art, expressing the new power and confidence of human society. The rational geometry of this Bronze Age art was transformed in the art of classical Greece into the vehicle for a heightened individual self-consciousness, which became more complex and more subjective in the imperial art of Rome. During the early Middle Ages—Byzantine, Carolingian, and Romanesque—new visions of otherworldly spirituality dissolved this classical formal language and recast it as the foundation of later European art. The arts of these cultures will be examined through the analysis of major monuments of architecture, sculpture and painting, with specific attention to the communicative function of the work of art as seen in relation to contemporary society and culture.

#### 12. Western Art II: Medieval to the Present (4)

In the twelfth century, European artists created the first unified and universal visual language since classical antiquity. Though this Gothic style was rejected by later artists, it changed the image of humanity and of the world. Donatello, Leonardo, Raphael, Michelangelo, and others in the Renaissance forged an art of extraordinary power out of a confluence of Gothic vi-

sual habits and the classical vocabulary which they sought to reclaim. For nearly two centuries, the language of these early modern artists was extended in scope and adapted to new modes of seeing and thinking by baroque artists such as Caravaggio, Rubens, Rembrandt, Velazquez, and Vermeer. The age of democracy and industrialization, ushered in by the American and French Revolutions, gave rise to a rapid succession of styles. Neo-classicism, romanticism, realism, impressionism and post-impressionism, cubism, dada and surrealism are products of the struggle to find a mode of artistic expression for a world of changing values, new institutions, and unprecedented diversity. Abstract expressionist, pop, minimalist and conceptual artists have taken on the task of grappling with the post-1945 world.

#### 13. Non-Western Art (4)

Traditional art forms from the Arctic and Northwest Coast, Melanesia, Polynesia, and West Africa will be considered along with ritual arts, body decoration, and architecture. By examining the arts, symbolism, and myths of nonliterate societies, alternative models emerge both for the formal language of the work of art and for its broader social functions.

#### 14. Nineteenth- and Twentieth-Century Art (4)

In Europe of the later eighteenth century, the cultural and political upheavals of the American, French, and early Industrial Revolutions provoked such artists as Goya, Blake, and David to produce daring works which broke with academic painting. From then on, the world and the arts changed rapidly, and along with them the nature of the art audience and art market: a new middle-class art public emerged as did the new structures of museums, galleries, and criticism. Neo-classicism, romanticism, realism, impressionism, and post-impressionism—represented by such artists as Ingres, Delacroix, Courbet, Bonheur, Monet, Degas, Cassatt, Gauguin, Van Gogh, Rodin, and Cezanne—developed under these new economic, political, and artistic circumstances. During the twentieth century, bold experiments with new techniques of representation such as fauvism (Matisse) and cubism (Picasso, Braque), with abstraction (Kandinsky, Taeuber-Arp, Mondrian, Malevich) and in dada and surrealism (Duchamp, Miro, Kahlo) with the energies of the irrational and the unconscious succeeded and interacted upon one another, posing new questions about the nature of art and the role of the artist in society. Architectural practice and theory was transformed by the coming of the international style and the teachings of the Bauhaus. The course will end with a study of art since World War II, including American abstract expressionism (Pollock, de Kooning, Krasner), the subsequent international movements of pop, minimal, conceptual and performance art, and the recent questioning of the established history and institutions of art by the Third World and women's art movements.

#### 41. Introduction to Programming—Part A (4)

Introduction to the fundamentals of the UNIX operating system and particularly to the "VI" editor. The course is given in the C language, and presents its syntax up to the use of two-dimensional arrays as representations of graphic events and of character strings for text manipulation. Stress throughout is upon the use of conditionals both in algorithmic design and in constructing nondeterministic programs. *Prerequisite: none.*

#### 42. Introduction to Programming—Part B (4)

This part of the course focuses upon dynamic storage allocation and upon the use of structures for the representation of complex types, lists, and trees. Emphasis is upon program design, and upon heuristic rather than algorithmic procedures. The second part of the quarter will be devoted to major projects specified by students, and to class discussion of issues arising in the design of those projects. *Prerequisite: VA 41.*

#### 60. Introduction to Photography (4)

An in-depth exploration of the camera, combining darkroom techniques in black and white. Emphasis is placed on develop-



ing reliable control of the fundamental materials and procedures through lectures, field, and lab experience. Basic discussion of image making included. Materials fee required.

**70. Introduction to Media I (4)**

As the first part to a two-part course sequence, this course provides a technical foundation and theoretical context for all production-oriented film and video studies. During laboratory periods specific group exercises will be performed with 1/2" and 3/4" video equipment. Completion of 70 is necessary to obtain a media card. Materials fee required.

**71. Introduction to Media II (4)**

As the second part to a two-part course sequence, this course emphasizes idea development and the analysis of the creative processes. The general principles of film and electronic media as language systems, genre, the notion of a critical attitude, and the social effect/function of media will be covered. Small student groups will produce short, well thought-out projects. Materials fee required. *Prerequisite: VA 70.*

**84. History of Film (4)**

A survey of the history and the art of the cinema. The course will stress the origins of cinema and the contributions of the earliest filmmakers, including those of Europe, Russia, and the United States. Materials fee required.

**90. Undergraduate Seminar (1)**

This seminar will introduce undergraduate students, especially freshmen and sophomores, to a variety of issues and topics organized around the research interests of faculty members.

**UPPER DIVISION**

**104A. Performance (4)**

A workshop for artists to extend their art-making possibilities through use of their own bodies as both physical and psychological material and its potential for interaction with other human and nonhuman materials. Includes study of contemporary artists already working in this area. *Prerequisites: VA 1, 2, 3 and either 14 or 111.*

**104B. Audience-Oriented Performance (4)**

A continuation of techniques and viewpoints developed in Visual Arts 104A but with an emphasis on performing for audiences. Autobiographical (solo) and social (group) performance, narrative performance, objects and spaces that perform, games and entertainments, rituals and transcendental performance are among the topics that may be covered. *Prerequisite: VA 104A or consent of instructor.*

**104C. Performance of Everyday Life (4)**

This course deals with that branch of performance art which is not based on traditional theatrical elements, but attempts to interact with everyday life. It explores activities carried out without audiences in the everyday world rather than in a staging area, gallery, or art studio. May be repeated once for credit. *Prerequisite: VA 104A or consent of instructor.*

**105A. Beginning Drawing (4)**

A course in beginning drawing covering line, value, texture, gestures, forms, and composition. These concepts will be introduced by the use of models, still life, and landscapes. The different media that will be used include charcoal, pencil, ink, and conte. *Prerequisites: VA 1, 2, 3 and either 14 or 111.*

**105B. Intermediate Drawing (4)**

A continuation of Visual Arts 105A. The student will be exposed to a wider variety of means in representation. The connotational range of different sorts of "marks" and represented "spaces" will be explored. *Prerequisite: VA 105A or consent of instructor.*

**105C. Advanced Drawing (4)**

For advanced students. Students will be given the opportunity to explore the relation between their own energy and idiosyncrasy

as draftsmen-artists and the quasi-objective demands of representing various types of real and virtual space. May be repeated once for credit. *Prerequisites: VA 105A and one additional upper-division drawing course or consent of instructor.*

**105D. Life Drawing (4)**

Using both nude and clothed models, the course explores the body as a human language that can be read and depicted from study of the body's stance, gesture, intention, and style. *Prerequisites: two upper-division drawing courses, or consent of instructor.*

**105E. Animal Drawing (4)**

A studio course which develops visual knowledge of and skill in capturing the form, movement, and texture of birds, animals, and fish. Special emphasis will be placed on understanding the environment of the animals and their behavior in that environment. The class will meet alternately on campus, at the zoo, the Museum of Natural History, Scripps Aquarium, and local farms. Students will be expected to carry out given assignments as well as initiate their own projects. May be repeated once for credit. *Prerequisite: VA 105A or consent of instructor.*

**105F. Calligraphic Drawing (4)**

This is a studio course exploring for contemporary purposes such verbal-visual art forms as Japanese calligraphy and the figurative drawing which grows out of it, Persian manuscripts, surrealist concrete poetry, and American cartoons which operate equally through text and image. *Prerequisite: VA 105A or consent of instructor.*

**106A. Beginning Painting (4)**

A studio course focusing on the problems involved in transferring information and ideas onto a two-dimensional surface. Specific assignments to be determined by the professor. *Prerequisites: VA 1, 2, 3 and either 14 or 111.*

**106B. Intermediate Painting (4)**

A studio course in painting, stressing individual creative problems. Specific problems to be investigated will be determined by the individual professors. May be repeated once for credit. *Prerequisite: VA 106A or consent of instructor.*

**106C. Advanced Painting (4)**

A studio course in painting, stressing individual creative problems. May be repeated once for credit. *Prerequisites: VA 106A and one additional upper-division painting course or consent of instructor.*

**106D. Beginning Representational Painting (4)**

This is a studio course which aims to examine the options open to a painter who wishes to work with pictorial subject matter. Participants will be asked to analyze their artistic directions with respect to format, drawing, subject, and execution. Instruction will be given in all these areas. Students will be expected to research assigned artists and art forms. May be repeated once for credit. *Prerequisite: VA 106A or consent of instructor.*

**106E. Intermediate Representational Painting (4)**

A continuation of Visual Arts 106D on the intermediate level. May be repeated once for credit. *Prerequisite: VA 106D.*

**107A. Beginning Sculpture (4)**

A studio course focusing on the problems involved in transferring information into three-dimensional objects. Specific problems to be investigated will be determined by individual professors. *Prerequisites: VA 1, 2, 3 and either 14 or 111.*

**107B. Intermediate Sculpture (4)**

An intermediate studio course in sculpture, stressing individual problems. Specific problems to be investigated will be determined by individual professors. May be repeated once for credit. *Prerequisite: VA 107A or consent of instructor.*

**107C. The Decorative Object and the Decorative Environment (4)**

This course will focus on the decorative object, tableau, and the decorative environment. Students will explore formal sculptural issues as applied to the concept of decoration in a series of studio problems. Class discussion will include some of the historical and cultural issues surrounding decoration. Materials will include: found objects, furniture, cardboard, paints, cloths, etc. May be repeated once for credit. *Prerequisite: VA 107A or consent of instructor.*

**107D. Representational Sculpture (4)**

Representational Sculpture will work with the model, found objects, photography, and drawing. Discussion and slides will be used to examine the history and theories of representation. Practice will address problems of narration. May be repeated once for credit. *Prerequisite: VA 107A or consent of instructor.*

**107E. Art in the Landscape (4)**

A studio course exploring any kind of sculpture that can be placed in the landscape, ranging from micro and actual objects to monumental installations, and including trails, meditation spaces, shelters, micro and macro parks and plazas—any kind of three-dimensional work claiming the external environment, natural or urban, as its context. *Prerequisite: VA 107A or consent of instructor.*

**107F. Tableau (4)**

Tableau will focus on groupings, clusters, and arrays that have narrative content. The sculptural issues of space, scale, and color will be addressed. Class discussion will refer to the function of tableau in diverse art forms. These include not only sculpture but painting, theater, film, and performance. Materials will include found objects as well as those specifically manufactured from cardboard, wood, canvas, and other simple materials. May be repeated once for credit. *Prerequisite: VA 107A or consent of instructor.*

**107G. Earthworks to Ecological Art (4)**

Sculpture and the Natural Environment. This course will focus on the use of the earth as grounds for art-making. An assessment of recent art in this area as well as underlying historical and cultural attitudes toward siting and the earth will form part of the class discussion. Projects will include sketches, photographs, drawings, proposals, and models. A final project may require works on sites available in university environs. May be repeated once for credit. *Prerequisite: VA 107A or consent of instructor.*

**107H. The Object as Sculpture (4)**

This class consists of creating three-dimensional objects by a variety of basic techniques such as building negative molds out of cardboard from which a positive object is cast in molding plaster. We will also use wood, cardboard, and "found" materials/objects to explore a basic attitude toward sculpture. Besides the studio work, there will be lectures and slides with emphasis on contemporary work. May be repeated once for credit. *Prerequisite: VA 107A or consent of instructor.*

**107I. Environment as Painting/Installation as Painting (4)**

The practice of painting as a generator of environmental space in transaction with architecture. The course deals with problems peculiar to sculptural implications of painting. Reference will be made to precedents in the mural programs of the past as well as to contemporary installations. Scale models of existing hypothetical architectural space and graphic aids such as drawing, photography, and collage may be utilized. May be repeated once for credit. *Prerequisite: VA 106A, VA 107A, or consent of instructor.*

**107J. Materials and Construction Sculpture (4)**

An intermediate course exploring the sculptural meanings obtainable through the choice of various types of materials and their combinations; and through various modes of joining, as-

sembly, and ordering. May be repeated once for credit. *Prerequisite: VA 107A or consent of instructor.*

**108. Advanced Projects in Art (4)**

A studio course for serious art students at the advanced level. Stress will be placed on individual creative problems. Specific orientation of this course will vary with the instructor. Topics may include film, video, photography, painting, performance, etc. May be repeated twice for credit. *Prerequisite: consent of instructor.*

**109. Advanced Projects in Media (4)**

A production course for serious upper-division media students. Individual or group projects will be completed over one or two quarters. A specific project organized by the student(s) will be realized during this course, with the instructor acting as a close adviser and critic. Formal concept papers or scripts must be completed and approved by the instructor prior to enrollment. May be repeated twice for credit. *Prerequisite: consent of instructor.*

**110. Artists' Books (4)**

This studio course, in which artists make and talk about books, is open to persons with backgrounds in painting, photography, sculpture, conceptual art, etc. Genre studies will include comic books, journals, morality tales, manifestos, etc. May be repeated once for credit. *Prerequisites: two upper-division courses in area, or consent of instructor.*

**111. The Structure of Art (4)**

This course will address the structure of signification in art. We will consider the modes of signification in a wide range of representational and nonrepresentational artworks from architecture through drawing, painting, sculpture, photography, video, and film to performance. Examples will be selected from various places and epochs. This course is required for transfer students.

**112. Art Historical Methods (4)**

A critical review of the principal strategies of investigation in past and present art-historical practice, a scrutiny of their contexts and underlying assumptions, and a look at alternative possibilities. The various traditions for formal and iconographic analysis as well as the categories of historical description will be studied. Required for all art history and criticism majors. *Prerequisite: one upper-division art history and criticism course; two recommended.*

**113A. History of Criticism I: Classical through Renaissance (4)**

This course will emphasize the origins of Western art critical thought with readings in the philosophical literature of antiquity. The theories of representation, of beauty, and of expressivity will be examined in the works of Plato and Aristotle. The theory of style will be studied in the rhetorical writings of Aristotle, Plutarch, Longinus, in Vitruvius' work on architecture and in Pliny's chapters on the history of art. Attention will be given to Augustine and the Church Fathers. Writings of the Middle Ages will be illustrated by readings in Villard de Honnecourt, in Theophilus Presbyter, and in Cennino Cennini. Some attention may be paid to writings by Ghiberti, Alberti, and Aretino. *Prerequisite: none; courses in art history and criticism recommended.*

**113B. History of Criticism II: The Enlightenment and The Early Modern Age (4)**

After a brief survey of selected seventeenth- and eighteenth-century texts, consisting mainly of the writings of connoisseurs, the course will concentrate on the newly emergent philosophical and art critical discourse in France, Germany, and England, with readings in such philosophical works as Kant's *Critique of Judgment*, Hegel's *Aesthetics*, Kirkegaard's *Either/Or*, and Nietzsche's *Birth of Tragedy*. Art critical writings will include selections from Diderot, Winckelmann, Reynolds, Stendhal, Baudelaire, Champfleury, Mallarme, Ruskin, Morris, Wilde, and Pater. Writings of various artists from Delacroix to

Whistler and Van Gogh will also be considered. *Prerequisite: none; courses in art history and criticism recommended.*

**113C. History of Criticism III: The Twentieth Century (4)**

This course will analyze the multiple currents of twentieth-century art critical discourse. Philosophical writers such as Croce, Dewey, Heidegger, Wittgenstein, and Cavell, Marxist critics such as Marx, Engels, Trotsky, Benjamin, Lukacs and Brecht, and French structuralist writers such as Barthes, Derrida, and Foucault may be considered. *Prerequisite: none; courses in art history and criticism recommended.*

**113D. History of Criticism IV: Contemporary Criticism (4)**

A course in post-World War II criticism, primarily American. The early writings of Rosenberg and Greenberg on abstract expressionism will constitute the beginning course readings, followed by Greenberg's later, widely influential writings of the 1960s. Other points of view by such writers as Lippard, Burnham, Kozloff, and Krauss may be studied as well as the critical writings of artists such as Newman, Reinhardt, Judd, Smithson, and Morris. Influential magazines and journals may be examined. *Prerequisite: none; courses in art history and criticism recommended.*

**114. Art Criticism (4)**

This course is intended to develop critical approaches to contemporary art. It will investigate contemporary forms of art criticism, stressing both traditional and alternate points of view. Outside field trips and critical writings will be assigned. May be repeated once for credit. *Prerequisite: consent of instructor.*

**117. Narrative Structures in the Visual Arts (4)**

How can a fixed image represent events in time? The strategies of story telling and their consequences for the meaning of works of art will be investigated. Content of the course will vary: Ancient, Medieval, Renaissance, Baroque, or Modern Art may be emphasized. May be repeated with permission of the instructor. *Prerequisites: Art Historical Methods (VA 112) or two upper-division courses in art history and criticism or consent of instructor.*

**118. Landscapes, Grottos, and Fountains (4)**

Introduction to evolving concepts of nature as seen in the art of garden design. Religious, philosophical, and social importance of gardens in Western and non-Western cultures. Iconography of gardens. Public and private gardens. Development of public parks and botanical gardens in England and the U.S. *Prerequisite: none.*

**119. Issues in the History of Architecture (4)**

This course examines the impact of architecture on the development of Western civilization from ancient Greece through the twentieth century. Lecture topics include the development of a critical vocabulary for the analysis of buildings, the relationship between architectural form and function, and the changing role of the architect in society. *Prerequisite: none.*

**120A. Greek Art (4)**

Greek classical civilization was a turning point in the history of humanity. Within a new kind of society, the idea of the individual as free and responsible was forged, and with it the invention of history, philosophy, tragedy, and science. The arts which expressed this cultural explosion were no less revolutionary. The achievements of Greek art in architecture, sculpture, and painting will be examined from their beginnings in the archaic period, to their epoch-making fulfillment in the classical decades of the fifth century B.C., to their diffusion over the entire ancient world in the age of Alexander and his successors. *Prerequisites: none; Western Art I (VA 11) recommended.*

**120B. Roman Art (4)**

Roman art was the "modern art" of antiquity. Out of their Italic tradition and the great inheritance of Greek classic and Hellenistic art, the Romans forged a new language of form to meet

the needs of a vast empire, a complex and tumultuous society, and a sophisticated, intellectually diverse culture. An unprecedented architecture of shaped space used new materials and revolutionary engineering techniques in boldly functional ways for purposes of psychological control and symbolic assertion. Sculpture in the round and in relief was pictorialized to gain spatial effects and immediacy of presence, and an extraordinary art of portraiture investigated the psychology while asserting the status claims of the individual. Extreme shifts of style, from the classicism of the age of Augustus to the expressionism of the third century A.D., are characteristic of this period. The new modes of architecture, sculpture, and painting, whether in the service of the rhetoric of state power or of the individual quest for meaning, were passed on to the medieval and ultimately to the modern West. *Prerequisite: none; Western Art I (VA 11) recommended.*

**120C. Late Antique Art (4)**

During the later centuries of the Roman Empire, the ancient world underwent a profound crisis. Beset by barbarian invasions, torn by internal conflict and drastic social change, inflamed with religious passion which was to lead to a transformed vision of the individual, the world, and the divine, this momentous age saw the conversion of the Roman world to Christianity, the transfer of power from Rome to Constantinople, and the creation of a new society and culture. Out of this ferment, during the centuries from Constantine to Justinian, there emerged new art forms fit to represent the new vision of an otherworldly reality: a vaulted architecture of diaphanous space, a new art of mosaic which dissolved surfaces in light, a figural language both abstractly symbolic and urgently expressive. The great creative epoch transformed the heritage of classical Greco-Roman art and laid the foundations of the art of the Christian West and Moslem East for the next thousand years. *Prerequisite: none; Western Art I (VA 11) or Roman Art (VA 120B) recommended.*

**121A. Prehistoric Art (4)**

Tens of thousands of years before the dawn of history, the hunting peoples of Ice Age Europe invented the first language of visual images of which all later societies are the inheritors. This figurative tradition—whose greatest monuments are the painted cave sanctuaries of France and Spain, such as the famed Lascaux and Altamira—still dazzles us with its unsurpassed vitality of artistic expression and mystifies us with the unanswered questions of its meaning. This course will offer an overview of the range and scope of Palaeolithic artistic production over its 20,000-year span, against the background of what is known about contemporary conditions of nature, society, and human life. It will present a critical review of the various modern interpretations of the function and meaning of Palaeolithic art, especially the theories of A. Leroi-Gourhan. It will conclude with a look at the perpetuation and transformation of Palaeolithic art and its world-view in the new Neolithic cultures—based on agriculture and settled town life—which arose in the Mediterranean and Near East at the close of the Ice Age, and which are the direct ancestors of our own urban and technological society. *Prerequisite: none; Western Art I (VA 11) recommended.*

**122A. Art of the Middle Ages (4)**

Introduction to the art and architecture of Western Europe from the fourth to fourteenth century. Topics include the legacy of antiquity, the creation of sacred space, new concepts of human representation, and the upside-down world of monsters and grotesques. *Prerequisite: none; Western Art I (VA 11) or Western Art II (VA 12) recommended.*

**122B. Renaissance Art (4)**

In the fifteenth century, artistic developments in Italy and Northern Europe followed parallel and, at times, interpenetrating courses. Artists in both regions sought to renew the visual languages they had inherited from the Middle Ages by bringing them into closer conformity with the laws of vision and of nature. As a result, artists like Donatello and Mantegna in Italy and Jan van Eyck and Rogier van der Weyden in Flanders pro-

duced works which presented timeless religious truths in the guise of temporal occurrences. Sustained by the achievements of their predecessors and nourished by the remains of Roman antiquity, Leonardo da Vinci, Michelangelo, Raphael, and Titian created a style that expressed with extraordinary power and directness the meaning of their humanist religion. For the rest of the sixteenth century, artists such as Dürer and Holbein, Veronese and El Greco mastered, used, and refined the visual language these earlier geniuses had created. *Prerequisite: none; Western Art II (VA 12) recommended.*

**122C. Baroque Art (4)**

The baroque style was created in Rome around 1600 and quickly spread throughout Italy and to the other countries of Europe. A period of increasing intellectual specialization, of the entrenchment of modern national boundaries, of the co-existence of rival religious organizations, of the formation of artistic academies, and of the flourishing of a middle class which provided patronage for the arts, the baroque period afforded individual artists a wide range of stylistic and expressive possibilities. By focusing on the major works of Caravaggio, Bernini, Borromini, Rubens, Rembrandt, and Vermeer, this course stresses the different ways each artist used the visual language inherited from the Renaissance. *Prerequisite: none; Western Art II (VA 12) recommended.*

**123A. Italian Art of the Early Renaissance (4)**

Spurred by a renewed interest in the natural world and in the classical past, a coterie of artists in contact with Brunelleschi and Donatello in Florence brought about a revival of the arts that spread throughout Italy. Freed from the medieval role of the artist as craftsman, Alberti, Piero della Francesca, Mantegna, Botticelli, and others produced works which embodied the highest values and intellectual achievements of the age. This course examines painting, sculpture, architecture, urban design, and art theory in a world of humanistic learning, of profound belief in God, and of faith in the inherent capacities of humanity, as an expression of the religious, philosophical, social, and political ideals of fifteenth-century Italy. *Prerequisite: none; Western Art II (VA 12) or Renaissance Art (VA 122B) recommended.*

**123B. High Renaissance Art (4)**

Ever since the sixteenth century, the names of Leonardo da Vinci, Bramante, Michelangelo, Raphael, and Titian have conjured up images of the highest artistic achievement. In this course, we will assess the qualities that made their art great by focusing on individual works such as the *Last Supper* and *Mona Lisa*, the *Tempietto* and *Church of St. Peter*, the *David* and the frescoes of the Sistine Chapel, *The School of Athens* and *Transfiguration*, the *Venus of Urbino* and *Sacred and Profane Love*. Particular emphasis will be given to the situations for which the works were produced, their religious and philosophical content, and their relation to contemporary art theory. *Prerequisite: none; Western Art II (VA 12) or Renaissance Art (VA 122B) recommended.*

**123C. Michelangelo (4)**

This course offers new approaches to understanding Michelangelo's greatest creations. By considering how each work relates to the setting for which it was intended, by regarding critical literature and artistic borrowings as evidence about the works, and by studying the thought of the spiritual reformers who counseled Michelangelo, new interpretations emerge which show the artist to be a deeply religious man who invested his works with both public and private meanings. *Prerequisite: one upper-division course in Renaissance art; Art Historical Methods (VA 112) or High Renaissance Art (VA 123B) recommended.*

**123D. The City in Italy (4)**

Each of the great Italian cities has a style and heritage all its own. This course considers the social, political, economic, and religious aspects of civic life which gave rise to the unique characteristics of such cities as Florence, Siena, Venice, or

Rome. Emphasis will be placed on the function and content of civic art, the architecture of public buildings, and the design of the urban environment. The specific content of the course, the city or cities and periods under consideration, will vary. *Prerequisite: none; Art Historical Methods (VA 112) recommended.*

**123F. Castles, Cathedrals, and Cities (4)**

Exploration of Gothic art in Western Europe through three leading centers of creative activity: the castle, the cathedral, and the city. Architecture, stained glass, illuminated manuscripts, tapestries and sculpture, both sacred and secular, are considered. *Prerequisite: none; Western Art I (VA 11) or Western Art II (VA 12) recommended.*

**123G. Art in the Age of Jan van Eyck (4)**

The new love of nature and intensified spirituality which characterize early northern Renaissance art are investigated through the work of late Gothic illuminators like Pucelle and the three fifteenth-century master painters Campin, van Eyck, and van der Weyden. *Prerequisite: none; Western Art I (VA 11) or Western Art II (VA 12) recommended.*

**123H. Images of Women in Medieval and Renaissance Art (4)**

Saints, witches, goddesses, and courtly ladies are surveyed in this course which explores how medieval and Renaissance attitudes towards women were expressed in the art of the period. The archetypal images of Eve and Mary are emphasized. *Prerequisite: none; Western Art I (VA 11) or Western Art II (VA 12) recommended.*

**123I. The Illuminated Manuscript in the Middle Ages (4)**

Traces the evolution of the illuminated manuscript, one of the most brilliant achievements in Western painting, from its origin in late antiquity to the disintegration of the manuscript tradition under the impact of the first printed books. *Prerequisite: none; Art Historical Methods (VA 112) or two upper-division courses in art history and criticism recommended.*

**123J. Jan van Eyck (4)**

Intensive study of the career of Jan van Eyck, whose magical paintings have always fascinated viewers with their microscopically detailed naturalism and subtly disguised spiritual meanings. Masterpieces like the *Arnolfini Wedding* are emphasized. *Prerequisite: none; Art Historical Methods (VA 112) or two upper-division courses in art history and criticism recommended.*

**123K. Albrecht Dürer and the First Media Revolution (4)**

Examination of the graphic work of Albrecht Dürer, the first master printmaker in Western art: his technical innovations, new subject matter, and relationship to the new audiences for art which large-scale production of visual images had created. *Prerequisite: none; Art Historical Methods (VA 112) or two upper-division courses in art history and criticism recommended.*

**123L. History of Print and Printed Images (4)**

Traces the history of graphic arts from the fifteenth century to the present, focusing on the invention of printmaking and its revolutionary impact on art and society and the work of master printmakers like Dürer, Rembrandt, and Daumier. *Prerequisite: none; Western Art I (VA 11) or Western Art II (VA 12) recommended.*

**123M. Baroque Architecture (4)**

This course provides a general introduction to the urban issues raised by the development of the great cities of baroque Europe. Special emphasis will be placed on the development of Rome as the ideal baroque city. *Prerequisite: none; may be substituted as a requirement for baroque art.*

**123N. Baroque Masters (4)**

The career and influence of a great master of seventeenth-century art such as Caravaggio, Bernini, Rembrandt, and Velasquez. Each student will prepare a class presentation and will

submit a research paper. *Prerequisite: Western Art II (VA 12) or one upper-division course in either Renaissance or baroque art.*

**124A. The Art of the Eighteenth Century (4)**

From Watteau to Goya, eighteenth-century artists turned to the past, especially to medieval Europe and to the antique and looked at the present for inspiration, imagery and style. Piranesi explored the antique ruins of Italy, Walpole studied the medieval architecture of England, and Hogarth the society of contemporary London, while in France, David delved into both antique and current historical events. Out of these studies came Piranesi's *Views of Rome*, Walpole's Gothic fantasy home of Strawberry Hill, Hogarth's *Rake's Progress*, and David's *Oath of the Horatii* and *Marat Assassinated*. In America, Jefferson and Stuart struggled with how to portray the new Republic in stone and paint. The American and French Revolutions and the rise of industrialization greatly affected European artists and art movements of the later eighteenth century. *Prerequisite: none; Western Art II (VA 12) or Nineteenth- and Twentieth-Century Art (VA 14) recommended.*

**124B. The Art of the Nineteenth Century (4)**

Napoleonic and post-Waterloo Europe witnessed the expansion and transformation of the previous century's neo-classical and romantic movements. These styles, closely intermeshed and chronologically overlapping, were challenged by the emergence of the realist movement in the 1840s. With the rise of the salons, museums, and galleries and of art criticism, the middle class took on a new interest in art. They joined with the upper classes to study, admire, mock and/or ignore the work of Gericault, Ingres, Delacroix, Courbet, Bonheur, and Manet in France; Constable, Turner and the Pre-Raphaelites in England; Friedrich in Germany; and Cole, Church, and Homer in America. By the end of the century, artists had to contend not only with photography as an alternative mode of visual representation, but also with the growing severance between the public and the avant-garde. Artists such as Degas, Monet, Cassatt, Seurat, Cezanne, Van Gogh, Gauguin, and Munch no longer had guaranteed access to exhibition space, critical approval, or public support. Brilliant and fascinating as was the art of the late nineteenth century, the price for making it, socially, psychologically and economically, was a high one for the artist. *Prerequisite: none; Western Art II (VA 12) or Nineteenth- and Twentieth-Century Art (VA 14) recommended.*

**124C. The Art of the Twentieth Century (4)**

In the first decade of the new century, Picasso's *Les Femmes d'Alger* and Matisse's *Joy of Life* shook Paris, a city soon to be dominated by the cubist movement; while in the New York of Stieglitz and O'Keeffe, the Parisian Duchamp came to seek his artistic fortune. In Italy, de Chirico and the boisterous futurists challenged accepted artistic standards, as did Nolde, Kirchner, and Kollwitz in Germany. Visionary abstraction was explored by Kandinsky in Munich, Mondrian in Holland, Taut and Arp in Switzerland and France, and Malevich in Russia, where other artists also became involved in the visual expression and promotion of the 1917 Russian Revolution. New architectural styles and approaches were developed by Corbusier, Wright, and the German Bauhaus architects. In the 1920s, cubist Paris became a surrealist center—visited by Ernst, Miro, Magritte, and Dali, among others. Many avant-garde European artists took refuge in New York during World War II. The highly original New York School of the 1940s and 1950s, often called Abstract Expressionism, responded deeply to these European presences as well as to its own New World cultural heritage. *Prerequisite: none; Western Art II (VA 12) or Nineteenth- and Twentieth-Century Art (VA 14) recommended.*

**125B. Modernist European Painting, 1876-1914 (4)**

An intensive examination of the emergence and development of modernist tendencies in European painting, with particular attention to the work of late nineteenth-century artists such as: Monet, Manet, Renoir, Cezanne, Seurat, Van Gogh, Toulouse-Lautrec, Munch, Gauguin, Degas, and others, and, in the first decade of the twentieth century, the work of Picasso, Matisse,



Duchamp, Kandinsky, and the schools of German Expressionists and the Italian Futurists. *Prerequisite: none; Western Art II (VA 12) or Nineteenth- and Twentieth-Century Art (VA 14) recommended.*

**125C. Matisse and Picasso (4)**

A study of two major artists of the early twentieth century: Matisse and Picasso. Matisse, the "conservative" modern, and Picasso, the "radical" modern. Particular emphasis will be placed on the sources and effects of their respective innovations within their contemporary context. *Prerequisite: Western Art II (VA 12) or Nineteenth- and Twentieth-Century Art (VA 14).*

**125D. Contemporary Art (4)**

After World War II, the relationship between America and Europe changed radically in the arena of both politics and art. American economic power supported the rise in prestige and fame of American art; witness the international success of the abstract expressionists Pollock and De Kooning. The course will examine the currents, complementary and contradictory, in American art since 1950; the ambiguous art of Johns, the chance inventions of Cage, the celebration, albeit often ironic, of popular culture and attitudes in Warhol, Marisol, and Oldenburg, the ambitions and restraints of minimalism, and the explosive, troubled art scene of the late 1960s. That time saw not only the emergence of art and technology, conceptual/process art, earthworks, and early performance/body art but also the artistic visions and painted, sculpted, and performed protests of the Third World and women's movements. The course will end with an examination of art of the 1970s—pattern and decoration, new image, etc.—and will finish with a look at the current reshifting of artistic power between Europe and America. *Prerequisite: none; Nineteenth- and Twentieth-Century Art (VA 14) recommended.*

**125E. History of Performance Art (4)**

The novel, perplexing, outrageous, and witty modes of performance by such contemporary artists as Acconci, Anderson, Antin, Beuys, Jonas, Kaprow, and Lacy will be examined in the critical framework of earlier twentieth-century experiments in music, theater, and dance as well as in the visual arts. The movements of futurism, dada and surrealism, the Russian avant-garde, the Bauhaus, abstract expressionism, and happenings provide antecedents for performance art. So do the fields of anthropology, sociology, and psychology as well as the theater practices and theories of Artaud, Brecht, Piscator, Meyerhold, and Stanislavsky, and the experimental dance of Duncan, Wigman, Laban, Graham, Cunningham, and Rainer. *Prerequisite: none.*

**125F. History of Twentieth-Century Sculpture (4)**

Sculpture reemerged as a major art form in the twentieth century. Beginning with the playful experiments of Picasso, the Readymades of Duchamp and the primordial purism of Brancusi, the notion of sculpture has been subjected to a continuous set of transformations. By the early 1920s, many new possibilities opened up: the comical constructions of the dadaists, the dream constructions of the surrealists, the utopian fantasies of the Russians, and the functional aspirations of the Bauhaus designers. Political developments in Eastern and Western Europe led to an ideological and fashion-driven resurgence of neo-representational sculpture in German and Italian fascist works and to applied art deco styles in America and France. At the end of the Second World War, the energies of sculpture were liberated once again to produce abstract expressionist and neo-dada sculpture: the work of David Smith, Jasper Johns, and Louise Nevelson. Styles and genres proliferated wildly in the late 1960s and early 1970s as sculptors drew upon a wide range of artistic and craft precedents. These new styles included minimal, site-specific and earthwork modes, and a variety of systems art bearing on technological, psychological, social, ecological, and political concerns. *Prerequisite: none; Nineteenth- and Twentieth-Century Art (VA 14) recommended.*

**125G. American Folk Art (4)**

This course will examine American folk arts which draw their strength from an amalgam of indigenous traditions and the personal vision of the artists. Limners, Shakers, the Santos of New Mexico, Afro-American folk artists, and quilt-makers will be discussed, as well as the role women play in the tradition of folk art. Independent research will be required. *Prerequisite: none; Art Historical Methods (VA 112) recommended.*

**126A. African and Afro-American Art (4)**

The dynamic, expressive arts of selected West African societies and their subsequent survival and transformation in the New World will be studied. Emphasis will be placed on Afro-American modes of art and ceremony in the United States, Haiti, Brazil, and Suriname. *Prerequisite: none; Non-Western Art (VA 13) recommended.*

**126B. Polynesian Art (4)**

The course will study the aristocratic art systems that once flourished in the Society, Marquesas, and Hawaiian Islands. The "mysteries" of Easter Island will be discussed along with the continuing tradition of the tapa-process in Tonga, and Samoa. Special attention will be given to the ongoing Maori arts from New Zealand, including the symbolic council houses and the significance of tattooing. *Prerequisite: none; Non-Western Art (VA 13) recommended.*

**126C. Melanesian Art (4)**

This course will analyze the role of "Big Man"/artist in this splendidly rich and diverse region of the world. The relationship of art to ritual acts, myth, and dance will be explored in select areas of New Guinea (i.e., the Abelam, Arapesh, Iatmul people) and West Irian (the Asmat). The study of the art systems unique to New Ireland, the New Hebrides, the Solomons, and Australia will further our understanding of artistic practices and symbolic models. *Prerequisite: none; Non-Western Art (VA 13) recommended.*

**126D. Art of the Southwest American Indians (4)**

The American Southwest is a culturally diverse area with a rich and varied artistic continuum. The Hopi, Navajo, Zuni, and Pueblo Indians all have their own ceremonies, art, and architecture. The course will explore the ancient pueblos of Chaco Canyon and Mesa Verde's "cliff houses," analyze the kachinas and shalako, and examine the famous weaving and pottery-making traditions of the present. *Prerequisite: none; Non-Western Art (VA 13) recommended.*

**127B. Western and Non-Western Rituals and Ceremonies (4)**

This course will examine the process of image making within specific ceremonies and/or rituals. Selected ceremonies from West Africa, Melanesia, Nepal and the United States, including both Christian and non-Christian imagery, will be considered. Performance art and masquerade will be analyzed within a non-Western framework. *Prerequisite: none; Non-Western Art (VA 13) recommended.*

**127C. Female Artists and Female Imagery (4)**

This course will analyze the equivocal role of women as artists in selected non-Western societies with a look at parallel phenomena in the West. It will also examine, within given cultural contexts, the significance of female imagery: what type of female images predominate (e.g., mother/child, splayed female, etc.) and who are the patrons and/or consumers of these images. *Prerequisite: one upper-division art history course; two recommended.*

**127D. Primitivism and Exoticism in Modern Art (4)**

At the turn of the century, the arts of Africa, Asia, and Oceania had a strong impact on modern art. European artists learned new formal and expressive devices. At the same time, their views of art and of themselves were shaped by a fervent—if misunderstood—image of exotic forms of life closer to nature. Gauguin, the cubists, the German expressionists, the surrealists, and later artists as well responded deeply to the stimulus

of these exotic cultures and their arts. *Prerequisite: none; Non-Western Art (VA 13) recommended.*

**128A-E. Topics in Art History and Criticism**

These lecture courses treat styles, movements, themes, and theories of art which are touched on only briefly in general survey courses but are not treated in our regularly scheduled upper-division lecture courses. As the courses under this heading will be offered less frequently than those of the regular curriculum, students are urged to check for availability and descriptions of these supplementary courses in the annual catalog listings. Like the courses listed under VA 129 below, the letters following the course number designate the general area in which the courses fall. Students may take courses with the same number but of different content more than once for credit, with consent of instructor and/or program adviser. *Prerequisite: none; courses in art history and criticism recommended*

**128A. Topics in Art Criticism and Theory (4)**

This course will treat topics such as: Art Theory in the Renaissance; Representation: The Realist Strategy; Views of Nature: Landscape Painting to Earthworks.

**128B. Topics in Ancient Art (4)**

This course will treat topics such as: High Classic Art, Hellenistic Art, Architecture of Ancient Rome and Its Empire.

**128C. Topics in Medieval, Renaissance, and Baroque Art (4)**

This course will treat topics such as: Romanesque Art, The Rise of the Gothic Style, Northern Renaissance Art, Baroque Architecture, Seventeenth-Century Painting in Spain and the Low Countries.

**128D. Topics in Modern Art (4)**

This course will treat topics such as Neoclassicism and Romanticism; Impressionism and Post-Impressionism; Cubism; Dada and Surrealism; Abstract Expressionism.

**128E. Topics in Non-Western Art (4)**

This course will explore such themes as the impact of Polynesian art and society on the works of Paul Gauguin; art forms (i.e., tattooing, architecture, masks) as visual manifestations of social relationships; the enigmatic use of punning in the visual arts.

**129A-E. Special Problems in Art History and Criticism**

These seminar courses provide the opportunity for in-depth study of a particular work, artist, subject, period, or issue. Courses offered under this heading may reflect the current research interests of the instructor or treat a controversial theme in the field of art history and criticism. Active student research and classroom participation are expected. Enrollment is limited, and preference will be given to majors. The letters (A, B, C, D, or E) following 129 in the course number designate the particular area of art history or criticism concerned. Students may take courses with the same number but of different content more than once for credit, with consent of the instructor and/or the program adviser. *Prerequisite: Art Historical Methods (VA 112) or two upper-division courses in art history and criticism.*

**129A. Special Problems in Art Criticism and Theory (4)**

Specialized aspects of the theory and criticism of art will be examined in a changing series of courses designed for intensive student participation. Topics currently foreseen will include: Object and Image: A Structural Enquiry; Sources and Development of Formalist Criticism: The Eighteenth Century to the Present; Symbolist Ideology and Practice in the Arts; Problems in the Theory of Modernism.

**129B. Special Problems in Ancient Art (4)**

This course will investigate particular themes or areas of ancient art in greater depth than is possible in period surveys. Topics currently foreseen include: The Portrait in Antiquity: Aspects of Self and Society; Art and Ideology in Augustan Rome; Roman Historical Relief.



**129C. Special Problems in Medieval, Renaissance, and Baroque Art (4)**

This course will treat a particular artist or problem of interpretation in medieval, Renaissance, and baroque art. Issues of the style, function, meaning, sources, impact, practice, and theory of art are investigated by focusing on a given artist, group of artists, work or works, subject, or historical and critical approach. The topics currently foreseen include: Alberti, Mantegna, and Leonardo: The Theory and Practice of Renaissance Art; The Art of Andrea Mantegna; Nudity and Sexuality in Christian Art; The Classical Tradition and Its Transformations.

**129D. Special Problems in Modern Art (4)**

This course will study specialized historical periods and problems, and individual artists in the eighteenth, nineteenth, and twentieth centuries up to the present. The topics under consideration include: The Art of the Empires: Vienna and London in the Late Nineteenth Century; Art, Culture, and Politics in the Weimar Republic; The Crisis of the Later 1960s: New Movements and Re-directions in Art and Criticism; Marcel Duchamp; Twentieth-Century Environmental Painting; Twentieth-Century Women Artists.

**129E. Special Problems in Non-Western Art (4)**

This course allows students to pursue issues of meaning, interpretation, and methodology in relationship to specific non-Western societies. Topics under consideration include: Day of the Dead in Tijuana; Popular and Tourist Art in Tonga; Santos Tradition of Folk Art in New Mexico.

**130. Special Projects in Visual Arts (4)**

Specific content will vary each quarter. Areas will cover expertise of visiting faculty. May be repeated twice for credit. *Prerequisite: consent of instructor.*

**131. Special Projects in Media (4)**

Specific content will vary each quarter. Areas will cover expertise of visiting faculty. May be repeated twice for credit. *Prerequisite: consent of instructor.*

**141. Introduction to Programming for Graphics (4)**

Introduction to the various graphic devices of both vector and raster types and to the software associated with them. This course is not concerned specifically with mathematical two-dimensional projections of three-dimensional objects; rather with the design of programs controlling the generation of graphic events as a medium for the artist. The second part of the quarter will be devoted to major projects specified by students, and to class discussion of issues arising in the design of those projects. *Prerequisites: VA 41 and 42.*

**150. History and Art of the Silent Cinema (4)**

An intensive investigation into the form, history, and meaning of the silent cinema from its inception as a nineteenth-century optical toy to its fullest expression in the works of such masters as D.W. Griffith, Charlie Chaplin, Eisenstein, Vertov, Vigo and others, with particular emphasis on the interrelationships between film and the other visual arts of the period. Materials fee required. *Prerequisite: VA 84 or consent of instructor.*

**151. History of the Experimental Film (4)**

An inquiry into a specialized alternative history of film, consisting of experimental works made outside the conventions of the movie industry and which in their style and nature are closer to modernist painting, poetry, etc., than to the mainstream theatrical cinema. Works by such film artists as Man Ray, Salvador Dali, Maya Deren, Stan Brakhage, and Michael Snow will be examined in depth. Materials fee required. *Prerequisite: VA 84 or consent of instructor.*

**152. Film in Social Context (4)**

This collection of courses gathers, under one cover, films that are strongly marked by period, geography, and the culture within which they received their dominating local quality. These courses pay particular attention to the stamp of place—climate, dress, habitation, language, music, politics—as well as

the filmic moves that helped color such works as environmental. The series takes in the following subjects: Third World films, the Munich films (the new wave of Germans who made their first features in Munich following 1967), Japanese movies, films of the American thirties and their relationship to current thought, American Westerns, Ethnographic Film, Brazil's Cinema Novo, etc. Specific topics to be covered will vary with the instructor. May be repeated twice for credit. Materials fee required. *Prerequisite: VA 84 or consent of instructor.*

**153. The Genre Series (4)**

A group of related courses exploring the conventions within such generic and mythic forms as the cowboy, shamus, chorus girls, and vampire films. May be repeated twice for credit. Materials fee required. *Prerequisite: none; VA 84 recommended.*

**154. Hard Look at the Movies (4)**

Examines a choice of films, selected along different lines of analysis, coherent within the particular premise of the course. Films are selected from different periods and genres among Hollywood, European, and Third World films. May be repeated once for credit. Materials fee required. *Prerequisite: VA 84 or consent of instructor.*

**155. The Director Series (4)**

A course that describes the experiences, looks, and structure of director-dominated films. A different director will be studied each quarter. The student will be required to attend the lecture in the course and to meet with the instructor at least once each week. May be repeated three times for credit. Materials fee required. *Prerequisite: VA 84 or consent of instructor.*

**157. Video History and Criticism (4)**

A lecture course that examines video as an art form, its relationship to the development from television and other art forms, and surveys current work in the medium. Materials fee required. *Prerequisites: VA 14, 84, and 111.*

**158. Critical History of Twentieth-Century Photography (4)**

The course will begin with a sketch of the early nineteenth-century background of the origins of photography and will articulate a number of the fundamental issues raised by it. It will then concentrate on the development of the medium from Stieglitz's Photo Secession to the present, emphasizing such critical issues as the factuality, truthfulness, or representation adequacy raised by the history of the genre, as well as its claims to art or craft status and the related questions of expressive capacity, relation to notions of taste, technical excellence, or stylistic significance. These will be studied in the context of the development of commercial and mass media uses of photography in the twentieth century. *Prerequisite: none.*

**165. Camera Techniques (4)**

An intermediate course involving refined control over different films, developers, papers, and other photographic techniques. Portfolio required for admission. Materials fee required. *Prerequisites: VA 60 and consent of instructor.*

**166. Advanced Camera Techniques (4)**

An advanced-level course involving new techniques and processes as well as refined control over different films, developers, papers, and other photographic materials. Portfolio required for admission. Materials fee required. *Prerequisites: VA 60, 165, 167, and consent of instructor.*

**167. Photographic Strategies (4)**

An introduction to the aesthetic problems in photography. Portfolio required for admission. Materials fee required. *Prerequisites: VA 60 and consent of instructor.*

**168. Color Techniques in Photography (4)**

Instruction in color photography and printing. Lectures on theory and demonstrations in shooting and printing color negatives. Portfolio required for admission. Materials fee required. *Prerequisites: VA 60, 165, 167 and consent of instructor.*

**172. Studio Video (4)**

A production course of video as a creative medium and the video studio as a production and post-production tool. Covers lighting, studio sound, the switcher and special effects, directing and editing in the controlled environment of the video studio. *Prerequisites: VA 60, 70, 71, 111, and 174.*

**173. Field Video (4)**

A production course emphasizing portable field video as a creative medium. Students will conceive, script, produce, direct, and edit short video assignments. This production and critique cycle is the basis of the course. Tapes by independent video artists will be shown and discussed. *Prerequisites: VA 60, 70, 71, 111, and 174.*

**174. Media Sketchbook (4)**

A first experience in formulating ideas and images for creative media production. As the traditional artist uses his or her sketchbook to draw rapid, bold concretizations of ideas, this class encourages speed, clarity, originality, and taking chances. *Prerequisite: VA 1 or 2 or 3, 14, 60, 70, 71, 84.*

**177. Scripting and Editing Strategies (4)**

The aim of this course is to familiarize students with pre-production and post-production techniques (shooting script, storyboard, continuity notes, etc.), their relationship and their interdependence. *Prerequisites: VA 70, 71, and 174, and two production courses (taken from 165, 167, 172, 173, and 186).*

**178. Experimental Media (4)**

A production course investigating a wide range of exploratory work in film, video, or photography. The course will concentrate on those works that fall outside the fixed genres of narrative and documentary or work on their boundaries. Several individual projects are required. May be repeated twice for credit. *Prerequisites: two required from VA 165, 167, 172, 173, 177, 186; VA 177 strongly recommended.*

**179. Narrative Media (4)**

A production course exploring narrative in film, video, or photography. Attention will be paid to the relations between "story" and narrative, to the difference between recording, reporting, and representing events and the creation for the viewer of the subjective experience of the unfolding of events. All students will be expected to complete several short narrative works, all of which will be critiqued in class. May be repeated twice for credit. *Prerequisites: two required from VA 165, 167, 172, 173, 177, 186; VA 177 strongly recommended.*

**180. Documentary Media (4)**

This is a production course investigating the concept of documentary. Studying examples from the documentary traditions of film, video and photography, this course will develop a critical discourse. May be repeated twice for credit. *Prerequisites: two required from VA 165, 167, 172, 173, 186; VA 177 strongly recommended.*

**181. Sound and Lighting (4)**

An advanced course aimed at gaining a sophisticated control on the application of sound and lighting theory. Examples in film and video will be screened and discussed. The sonic portion of the course will trace the evolution of film and video recording and manipulation, emphasizing current practice and equipment. The areas of acoustics fundamental electronics, microphones and recording devices, and the general theories of sound image relationship will be covered. The second portion of the course will study the theory and practice of illumination for film and video production. The strategies, processes, and equipment for both studio and location lighting will be covered. Each student will produce a project for each section of the course. *Prerequisite: one from either VA 172, 173, or 186.*

**182. Advanced Editing (4)**

Covering both film and video editing, this course is designed to study the problems of editing from both a theoretical and practical point of view. Films and tapes will be analyzed on a

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frame-by-frame, shot-by-shot basis. Course may be repeated twice for credit. *Prerequisite:* VA 177 and either 172, 173, or 186.

### 186. 16mm Film Strategies (4)

This production course is designed to heighten the students' understanding of film theory and practice. The techniques of camerawork, lighting, editing, sound, printing, and processing will be covered. *Prerequisites:* VA 1 or 2 or 3, 14, 60, 70, 71, 84 and 174.

### 187. Animation (4)

A labor-intensive, moderately technical 16mm production course using departmental facilities. Assignments designed to explore different techniques such as cell and drawn animation, clay and object animation, cut-outs, rotoscope imagery and other special effects. Large amount of time required. Ability in drawing not necessary. May be repeated once for credit. *Prerequisites:* VA 186 and consent of instructor.

### 188. Optical Printing (4)

An intensive, hands-on 16mm production workshop utilizing the facilities of the Department of Visual Arts' special effects lab. The course, which is moderately technical in nature, is fundamentally concerned with the meaning of filmic manipulation through time. Numerous class exercises. Enrollment limited to sixteen students. May be repeated once for credit. *Prerequisites:* VA 60 and 186 or consent of instructor.

### 190. Polynesian Music and Dance (4)

The performing arts . . . traditional dance and music from small-scale societies. This course will examine in an experiential manner the performative mode of ceremonial dance and music from the islands of Polynesia to West African cultures. *Prerequisite:* none; concurrent corequisite: VA 13.

### 195. Teaching in Visual Arts (4)

Each student will meet with a section once a week under the direction of the instructor. The student will be required to attend the lecture in the course and to meet with the instructor at least once each week. May be repeated three times for credit. *Prerequisite:* consent of instructor.

NOTE: Open only to highly advanced upper-division students. Requires both instructor's and department chair's approval. Pass/Not Pass grades only.

### 198. Directed Group Study (2-4)

Directed group study on a topic or in a group field not included in regular department curriculum, by special arrangement with a faculty member. *Prerequisite:* consent of instructor. NOTE: Open only to upper-division students. Requires instructor's, department chair's, and provost's approval. Pass/Not Pass grades only.

### 199. Special Studies in the Visual Arts (4)

Independent reading, research, or creative work under direction of a faculty member. *Prerequisite:* consent of instructor. NOTE: Open only to upper-division students. Requires instructor's, department chair's, and provost's approval. Pass/Not Pass grades only.

## GRADUATE

### 204. Performance (4)

The class considers the performance aspect of much contemporary art. All graduate students, including those without a performance background, are welcome. Students will consider their own work within a process-oriented or performance context. The course will feature collaborative and critical participation, which is intended to offset the often isolated conditions under which most graduate students work. Talks given by visitors will offer an insider's view to the conditions, problems, and aspirations of practicing performance artists. Each student

is responsible for a large project to be presented by the end of the term. May be repeated for credit.

### 205. Graduate Studies in Drawing (4)

A studio course in drawing focusing on individual projects. May be repeated for credit.

### 206. Graduate Studies in Painting (4)

A studio course in painting focusing on individual projects. May be repeated for credit.

### 207. Graduate Studies in Sculpture (4)

A studio course in sculpture focusing on individual projects. May be repeated for credit.

### 208. History of Performance (4)

This course will survey the origins and development of recent performance in the visual arts. Such movements as Gutai (Japan), Yves Klein's anthropometries, happenings, events, Fluxus (Europe and U.S.A.), earthworks, bodyworks, postal art, conceptualism and feminist performance comprise the broad range of activity in the last twenty-five years. The class will examine the theoretical bases and critical issues of performance as these may relate to the larger field of the arts today.

### 214. Intentionality (4)

This course is concerned with an inquiry into the possibility and conditions of interpretation of works of visual art. How are the wider contexts of the work, the intentions—conscious or otherwise—of its author, the immediate psychic and material circumstances of its creation, its envisioned function, and the persona who is the fictional counterpart of the real-life viewer, encoded into its structure? Previous theoretical approaches to these issues will be examined, alternative analytical models suggested, and these tested in a detailed analysis of specific works of art.

### 216. The Object (4)

An inquiry into the world of artifacts (some of them "works of art") by which human beings are surrounded, and the ways in which they function as agents of communication and modifiers of consciousness. Contemporary perspectives drawn from the fields of anthropology, sociology, contemporary art, and semiotics will be utilized alongside those derived from art theory, especially the structural-analytic tradition.

### 218. Marcel Duchamp (4)

A critical examination of the work of the most radical of the twentieth-century artists. In Duchamp's four-dimensional perspective, the ideas of art-object, artist, and art itself are deconstructed. *The Large Glass* and *Étant Donées* . . . are the twin foci of an *oeuvre* without boundaries to which the invention of most of twentieth-century's avant-garde devices (chance techniques, conceptual art, etc.) are only incidental.

### 222. Communities and Art (The Shakers, William Morris & Co., and Bauhaus) (4)

A critical review of three communities which aimed to change the social and spiritual quality of life by aesthetic means. *Prerequisite:* graduate status or consent of instructor.

### 230. Graduate Studies in Art Criticism: Theory (4)

Seminars for advanced students in art criticism and art history in relation to the problems set by the real phenomenon of art production. Specifically advanced, individual projects will be required of graduate students. May be repeated for credit.

### 232. Tactics and Strategies (4)

A workshop-laboratory class involving a game-theory approach to the making of art in which attempts will be made to define a domain of interaction between a variety of possible players, the simplest of which is a two-person game involving art-audience.

### 236. Graduate Studies in Art Criticism: Practice (4)

This course is largely for people who intend to write criticism. It will attempt to explore various approaches to criticism, largely through the writings of contemporary art criticism,

though literary and film criticism will also be considered. Each student will be expected to write and deliver several short critical papers on subjects within his or her competence. May be repeated for credit.

### 237. Graduate Studies in Art (4)

This course provides the opportunity for in-depth graduate study in the practical, critical, ideological, or theoretical contexts and contents of art making. Courses under this heading may reflect current interests of the instructor or treat a controversial issue in the art world. In recent years, the course has been devoted to topics such as film history in Russia after the Revolution, exploration in subject matter and form, scripting (film, video), portraiture, art as editing, art and technologies. May be repeated for credit.

### 244. Charting and Subject Matter (4)

This is a narrative-based course which uses various forms of storytelling. It focuses on a methodology for establishing autobiographical material, ordering it and presenting it in various media.

### 278. Graduate Video Seminar (4)

The seminar will examine video as an art form, with particular emphasis on recent works of independent video artists. The specific expressive nature of the video image, questions of form and meaning, and the evolving relationship of video art to the other arts will be studied in depth.

### 279. Graduate Video Workshop (4)

The course explores creative aspects of the video medium through various formats, styles and approaches in independent production, integrating elements into artistic form. Concept, development from script, shooting, editing, sound, etc., will be stressed. May be repeated for credit. *Prerequisite:* consent of instructor.

### 288. Advanced Studies in Film (4)

A film course dealing with all aspects of film criticism and film writing, stressing individual problems. May be repeated for credit.

### 289. Graduate Film Seminar (4)

Designed to deal with a wide variety of practical aspects of the film, including direction, script writing, criticism, and photography. *Prerequisite:* consent of instructor.

### 290A. Graduate Seminar (4) Contemporary World Views

As products of a human mind, all works of art are conceived within the value system of their maker. Whether or not the artist is conscious of it, the world of art reflects a world view. Once produced, it becomes susceptible to interpretations which attach to it or find in it human values. Some of these values are ideological, such as "socialist realism," others are more a matter of artistic outlook or belief, such as "expressivist," "idealist," "mimetic," and "realistic." This course will locate the world views implicit within contemporary works of art, including, when appropriate, those of the faculty and graduates. Required of first-year students.

### 290B. Graduate Seminar (4)

#### Critical Approaches to Art Making: Context, Subtext, and Pretext

This course is designed to encourage the development of a self-critical approach to art making. Key intellectual issues of contemporary art will be explored through the discussion of writings by artists and critics. Topics to be discussed include the concept of artistic tradition; art and politics and the politics of art and criticism; women's art and feminism; modernism and post-modernism as period concepts; representation, re-presentation and the textuality of art; the function and significance of quotation and appropriation in art; and media specific approaches to art. Required of first-year students.

**295. Individual Studies for Graduate Students (1-12)**  
Individual research for graduate students in preparation for their comprehensive examinations for the M.F.A. degree.

**298. Directed Group Study (1-12)**  
Directed group study on specific topics not covered at present in the normal curriculum. Used as an experimental testing of courses that may be given regular course numbers if proved successful. Special arrangement with faculty member. *Prerequisite: consent of department.*

**299. Graduate Research (1-4)**  
Graduate-level research under the direct guidance of a faculty member. *Prerequisite: consent of instructor.*

**500. Apprentice Teaching (1-4)**  
Apprentice teaching in undergraduate courses given by the Department of Visual Arts. Graduate students are required to teach a minimum of one quarter (three units) within the department to fulfill degree requirement.

## WARREN COLLEGE

OFFICE: Building 410, Literature Building, Second Floor, Warren Campus

### THE WRITING PROGRAM

OFFICE: Building 410, Matthews Administrative and Academic Complex

Warren College 10A and 10B are required of every Warren College student. This general-education sequence must be taken immediately following the fulfillment of the Subject A requirement. The purpose of the sequence is to teach and thereby enable students, through intensive practice and critiquing, to read and think critically and to communicate authentically in writing with a sense of the demands of varying contexts. Classes are seminar-size and center on discussion of student work.

The two-quarter sequence emphasizes a variety of forms and aims of writing, and attends both to narrative and to analytical and argumentative writing based on primary and secondary sources. The curriculum provides a context within which a diversity of cultural experiences is foregrounded to address the range of issues inherent in the relationship of the "Individual and U.S. Society," the primary theme of the sequence. The readings are accessible, scholarly writings that interrogate aspects of this relationship, and may include novels, short stories, essays, autobiographies, political documents, and book-length nonfictional treatments of the theme. Thus, the readings prepare students for their studies in the Ethics and Society course as well as for their work in the various academic disciplines.

In both 10A and 10B, student writing is duplicated and discussed by the class in a workshop

setting. Instructors hold conferences with students individually during the quarter and provide written and oral commentaries on all student work. Every student receives a mid-quarter evaluation, and a final narrative evaluation is placed in the student's academic file. The minimum writing requirement is 8,000 words per quarter. Warren College 10A and 10B are offered P/NP only, and students cannot test out of this general-education requirement.

**10A-10B. The Writing Course (4-4)**  
A workshop course in reading and writing required of all Warren College students. The course emphasizes a variety of forms and aims of writing and includes attention both to narrative and to analytical and argumentative writing based on sources. *Prerequisite: satisfaction of the university Subject A requirement.*

### THE SCHOLARS PROGRAM

OFFICE: Warren Scholars Program, Literature Building, Second Floor, Warren Campus

Warren Scholars is a four-year program offering an interdisciplinary academic curriculum and special activities that foster close student-faculty interaction, promote a sense of community, and enrich undergraduate education and student campus life. The Scholars Program offers students educational, cultural, and social experiences designed to help students broaden their intellectual interests beyond their major. An annual reception is held in their honor with participating faculty and key college staff. The Michael Addison Award is given to the scholar with the most distinguished research paper. Each scholar completing the program receives a transcript notation on UCSD records certifying completion of the Warren Scholars Program and is given special honors during graduation ceremonies.

### ELIGIBILITY REQUIREMENTS

Eligibility requirements are a high school GPA of 3.8 and an SAT score of 650 in verbal and 650 in mathematics, for entering freshmen only. To maintain status in the Scholars Program, all students must be on the Provost's Honor List at least one quarter per year. All students with outstanding academic credentials are encouraged to apply by writing to: Warren Scholars Program, Warren College, 0422, UCSD, La Jolla, CA 92093.

### ACADEMIC PROGRAM

In the freshman year scholars will enroll in a Warren Scholars Seminar (Warren 11A-11B) fall and winter quarters. Each of the two seminars will focus on an interdisciplinary study. These courses will replace the required Warren College writing courses.

In the junior or senior year scholars must write a research paper on a subject outside their own disciplinary area. Scholars may replace one upper-division course in a minor (program of concentration or area study) with an independent study 199, in conjunction with the research project.

### SPECIAL ACTIVITIES

Scholars participate in a wide range of activities that promote educational, cultural, and social experiences with faculty and key Warren College staff members. These informal extracurricular events provide opportunities for students to examine shared experiences from the diverse perspectives of their peers and faculty members. Typically, one informal special activity is held each quarter, and each one serves to build and maintain a sense of community among the scholars.

**11A-11B. Warren Scholars Seminar (4-4)**  
The purpose of the Warren College Scholars Seminar is to allow students to develop and refine their expressive and analytical skills by participation in a two-quarter sequence. The emphasis will be on an interdisciplinary approach to a group of texts chosen for this purpose. The subjects will be selected in order to form a coherent and detailed investigation of issues central to the relation of individuals and society. Topics may vary and may include the function of evidence and observation in the formation of theories, the moral dimension of the theorist's role, and the economic implications of ideologies.

### ETHICS AND SOCIETY

OFFICE: Academic Advising, Literature Building, Second Floor, Warren Campus

Ethics and Society is an interdisciplinary course required of all Warren students entering fall 1985 and thereafter. It is cross-listed as Political Science 27 and Philosophy 27 (see departmental listings). A student may enroll in this course through either department, but not both. Ethics and Society is to be taken after the completion of Warren Writing 10A-10B (or Scholars Seminar 11A-11B), either in the spring of the freshman year or in any quarter of the sophomore year. This requirement is waived for certain upper-division transfer students (see the program of concentration brochure).

### HEALTH CARE—SOCIAL ISSUES

OFFICE: Interdisciplinary Programs, Literature Building, Second Floor, Warren Campus

Health care—social issues is an interdisciplinary minor administered by Warren College but available to all UCSD students with a general interest in health care issues and to students considering a health care career. For more infor-

## WOMEN'S STUDIES

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mation, see listing under "Health Care—Social Issues."

### LAW AND SOCIETY

OFFICE: Interdisciplinary Programs, Literature Building, Second Floor, Warren Campus

Law and society is an interdisciplinary minor administered by Warren College, but available to all UCSD students with a general interest in law as a social institution and to students considering law-related careers. For more information, see listing under "Law and Society."

### ACADEMIC INTERNSHIP

OFFICE: Literature Building, Second Floor, Warren Campus

The Academic Internship Program is developed and administered by Warren College, but it is available to juniors and seniors with a 2.5 GPA in any college at UCSD. For more information, see listing under "Academic Internship."

### ONE-UNIT UNDERGRADUATE SEMINAR

The One-Unit Undergraduate Seminar Program is a campuswide program administered by Warren College. The purpose is to (a) foster closer interaction between undergraduate students and faculty members; (b) introduce undergraduates to exciting areas of intellectual interest. Generally, the seminars are accessible to students at all levels with no prerequisites. Enrollments are limited to twenty-five students per seminar. Grading is P/NP only, and each student is limited to three seminars for credit.

## WOMEN'S STUDIES

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OFFICE: 2134 Humanities & Social Sciences Building, Muir College, 534-3583

### Affiliated Faculty

#### Professors

Abraham Dijkstra, Ph.D., *Literature*  
Page duBois, Ph.D., *Literature*  
Frances Foster, Ph.D., *Literature*  
Helene Keyssar, Ph.D., *Communication*  
Susan Kirkpatrick, Ph.D., *Literature*  
Louis Montrose, Ph.D., *Literature*  
Chandra Mukerji, Ph.D., *Sociology/Communication*

Carol Plantamura, M.F.A., *Music*  
Jacqueline Wiseman, Ph.D., *Sociology*

#### Associate Professors

Rae Blumberg, Ph.D., *Sociology*  
Susan G. Davis, Ph.D., *Communication*  
Stephanie Jed, Ph.D., *Literature*  
Rachel Klein, Ph.D., *History*  
Carol Padden, Ph.D., *Communication*  
Fitz John Porter Poole, Ph.D., *Anthropology*  
Marta Sanchez, Ph.D., *Literature*  
Kathryn Shevelow, Ph.D., *Literature*  
Shirley Strum, Ph.D., *Anthropology*  
Jehanne Teilhet, Ph.D., *Visual Arts*  
Sandra Vehrencamp, Ph.D., *Biology*  
Cynthia Walk, Ph.D., *Literature*

#### Assistant Professors

Judith Halberstam, Ph.D., *Literature*  
Valerie Hartouni, Ph.D., *Communication*  
Nicole Hoffman, Ph.D., *Literature*  
Beth Holmgren, Ph.D., *Literature*  
Christine Hunefeldt, Ph.D., *History*  
Martha Lampland, Ph.D., *Sociology*  
Lisa Lowe, Ph.D., *Literature*  
Stephanie McCurry, Ph.D., *History*  
Michael Meranze, Ph.D., *History*  
Pamela Radcliff, Ph.D., *History*  
Roddey Reid, Ph.D., *Literature*  
Susan Smith, Ph.D., *Visual Arts*  
Paule Cruz-Takash, Ph.D., *Ethnic Studies*  
Cynthia Truant, Ph.D., *History*  
Winifred Woodhull, Ph.D., *Literature*

#### Adjunct Associate Professor

Mary Walshok, Ph.D., *Sociology*

The rapid and dramatic changes in the roles of women (and men) during the last two decades have generated great interest and given rise to the serious study of the origins and meanings of gender. The Women's Studies Program at UCSD is designed to promote teaching and scholarship in a wide range of humanities and social science disciplines. The goal of the program is to understand the social, historical, economic, and biological dimensions of "women's place."

The centerpiece of the program is a women's studies minor open to undergraduates in all colleges. The minor consists of six courses as follows: the three-course lower-division sequence titled Women's Studies 2A-B-C: Introduction to Women's Studies; three upper-division courses selected from a group of courses which are applicable to the minor. Of the three upper-division courses, no more than two may come from the same department.

Women's studies minors should consult with the director of the Women's Studies Program concerning their programs of study. In addition, women's studies faculty will be working with

counselors in each college and with students from the Women's Center to help students explore their interests within the minor, and to pursue independent projects of study and reading.

The proposal for a women's studies major is pending final approval. Please contact the Women's Studies Office (ext. 43589) for details.

## Courses

### Approved for the Women's Studies Minor

#### LOWER DIVISION

##### Women's Studies 2A. Introduction to Women's Studies: Gender in History and Culture (4)

This course will focus on manifestations of gender difference in the history and literature of one or more cultures, studying the social construction of gender both in the symbolic representations and institutionalized practices of a given society and period.

##### Women's Studies 2B. Introduction to Women's Studies: Gender and Identity (4)

This course will emphasize gender and the individual, with consideration of psychological, sociological, biological, and anthropological notions of gendered identity.

##### Women's Studies 2C. Introduction to Women's Studies: Women and Contemporary Issues (4)

This course will treat specific issues of social policy that affect women in particular. Topics may include abortion, reproductive rights, new reproductive technologies, and the feminization of poverty.

#### UPPER DIVISION

##### Women's Studies 102. Selected Topics in Women's Studies (4)

An interdisciplinary course focusing on one of a variety of topics in women's studies, such as gender and science, the body, reproductive technologies, women and public policy. May be repeated for credit as topics vary. *Prerequisite: upper-division standing or consent of instructor.*

##### Women's Studies 103. Feminist Theory (4)

An interdisciplinary course in feminist theory. Topics may range from a general survey of feminist theory in a variety of disciplines to a more focused interdisciplinary theoretical topic, such as postmodernism and feminism. May be repeated for credit as topics vary. *Prerequisite: upper-division standing or consent of instructor.*

##### Women's Studies 104. Cross-Cultural Perspectives (4)

An interdisciplinary course focusing on the relationship between gender and culture from a multiplicity of cultural perspectives. Possible topics include women in Latin America, gender and ethnicity, Asian-American women. May be repeated for credit as topics vary. *Prerequisite: upper-division standing or consent of instructor.*

##### Comm/Cul 108. Images of Women (4)

An analysis of American stereotypes of women and their use in media images. Student involvement includes (1) reviewing literature on the sociology of sex-roles; (2) developing media portraits of women to serve as data for class analysis; and (3) writing final paper on the stereotypes employed in generating these portraits. *Prerequisites: Comm/Cul 100 and Comm/Gen 100-VA 170, or consent of instructor.*



**Comm/Cul 115. The Theatre of Private Life: Family and Friends (4)**

A close examination of theatre informed by a concern for the nature of human interaction and personal interplay, as revealed by conflict within families or small groups. *Prerequisite: Comm/Cul 100 required. Comm/Gen 100-VA 170 recommended or consent of instructor.*

**Comm/Cul 116. Feminist Theatre Workshop (4)**

This course explores the relationship between dramatic production and theory in a feminist context. Examination of such questions as the nature of collaboration, gender as an aspect of role identity, sexual codes of behavior. This class will create, as an ensemble, a live dramatic production of feminist drama and collaborate on a video production. *Prerequisites: completion of pre-major, Comm/Cul 100, Comm/Gen 100. Major only or consent of instructor.*

**Comm/Cul 137. Politics of Bodies (4)**

This course will explore the construction of gendered bodies and gendered sexuality in the late twentieth-century postindustrial cultures. Through the use of film, fiction and theory, as well as political, historical and media analysis, we will examine the contested terrain, including the race and class coding of such issues as abortion, infertility, eating disorders, gender identity, and AIDS. *Prerequisite: Comm/Cul 100 or Women's Studies 2A, 2B, or 2C.*

**Comm/Cul 138. Feminist Theory (4)**

This class is designed to initiate students into the pleasure, pains, and perplexities of critical thinking about gender. We will survey a wide variety of thinkers and issues, consider some of the historical as well as contemporary debates within Western feminist thought, and develop tools of analysis for future work. *Prerequisite: upper-division standing. Recommended: Women's Studies 2A, 2B, or 2C.*

**Comm/Cul 139. Reproductive Discourse and Gender (4)**

In this course, we will examine as a problem of discourse and culture the controversies surrounding the development and use of the new technologies of human genetics and reproduction. Of particular interest will be the way in which these new technological practices and processes test, erode or undermine traditional understanding of human nature and relationship, while enforcing traditional understanding of gender. *Prerequisite: Comm/Cul 137 or Women's Studies 2A, 2B, or 2C.*

**Ethnic Studies 134. The Chicana (4)**

A critical study of gender, ethnicity, class, and national origin as it pertains to the Chicana. The course will have a historical focus and examine literary and social science texts written by Chicana/o and non-Chicano writers.

**Ethnic Studies 183. Gender, Race, Ethnicity, and Class (4)**

Gender is often neglected in studies of ethnic/racial politics. This seminar explores the relationship of race, ethnicity, class and gender by examining the participation of working class women of color in community politics and how they challenge mainstream political theory.

**HIEA 125. History of Women in China (4)**

This course concerns women in Chinese history from the earliest times to the present. The course will focus on women's changing roles in the family, society, and culture. *Prerequisites: upper-division standing or consent of instructor.*

**HIEU 147. The History of Women in Europe: The Middle Ages to the Industrial Revolution (4)**

This course deals with changes in women's role, status, and sexual taboos from the beginning of the Middle Ages to 1789.

**HIEU 148. The History of Women in Europe: The Industrial Revolution to the Present (4)**

This course covers the history of women from the Industrial Revolution to the present, focussing on the role of women in

radical political movements, the evolution of women's work, and feminism.

**HILA 161. History of Women in Latin America (4)**

A broad historical overview of Hispanic-American women's history, focusing on issues of gender, sexuality, and the family as they relate to women, as well as the historiographical issues in Latin American and Chicana women's history.

**HISC 103. Gender and Science in Historical Perspective (4)**

This course will examine the history of women's struggles and strategies for access and equality in professional science. Questions related to gender bias in science—as a social institution and as an epistemological enterprise—will be addressed in light of the historical and biographical readings.

**HIUS 130. Cultural History from 1607 to the Civil War (4)**

This course will explore connections between American culture and the transformation of class relations, gender ideology, and political thought. Topics will include the transformation of religious perspectives and practices, republican art and architecture, artisan and working class culture, the changing place of art and artists in American society, antebellum reform movements, and anti-slavery and pro-slavery thought. (May be taken for women's studies credit when the theme of women is a course focus.)

**HIUS 131. Cultural History from the Civil War to the Present (4)**

This course will focus on the transformation of work and leisure in the development of consumer culture. Students will consider connections between culture, class relations, gender ideology, and politics. Topics will include labor radicalism, Taylorism, the development of organized sports, the rise of department stores, the transformation of middle-class sexual morality, the growth of commercial entertainment, and the culture of the Cold War. (May be taken for women's studies credit when the theme of women is a course focus.)

**HIUS 156. American Women, American Womanhood (4)**

This course explores the emergence of a dominant ideology of womanhood in America in the early nineteenth century, and contrasts the ideal with the historically diverse experience of women of different races and classes, from settlement to 1870. Topics include witchcraft, evangelicalism, the cult of domesticity, sexuality, the rise of industrial capitalism, and the transformation of women's work, the Civil War, and the first feminist movement.

**HIUS 157. American Women, American Womanhood 1870 to Present (4)**

This course explores the making of the ideology of womanhood in modern America and the diversity of American women's experience from 1870 to the present. Topics include the suffrage movement, the struggle for reproductive rights and the ERA; immigrant and working-class women, women's work, and labor organization; education, the modern feminist movement and the contemporary politics of reproduction, including abortion and surrogate motherhood. *Prerequisite: upper-division standing.*

**HIUS 172. Feminist Traditions in America (4)**

This course considers three arenas of feminist activity in American history—women's activism, the female intellectual tradition, feminist theory—to explore the diversity of the feminist tradition, and to examine competing definitions of feminism, from the eighteenth century to the present day. Topics will range from abolitionism and temperance to the women's labor movement, from Emily Dickinson and Louisa May Alcott to Toni Morrison, and from Margaret Fuller and Elizabeth Cady Stanton to Betty Friedan, and the ERA. Special topics. *Prerequisite: department stamp or consent of instructor.*

**HIUS 173. Topics in American Women's History (4)**

The specific content of the course will vary from year to year but will always analyze in depth a limited number of issues in American women's history. Special topics. Department stamp or consent of instructor. (Formerly Hist. 163Q.)

**HIUS 177. Gender and Sovereignty in the Age of Revolution (4)**

Intersection of gender and sovereignty in the age of democratic revolution. Topics include relations between class, gender, the individual and the states; changing definitions of masculinity and femininity, and women and revolution. Materials from England, France, and the United States.

**Lit/En 120E. Women in the Eighteenth Century (4)**

Selected topics concerning British women writers and readers in an age of increasing female participation in print culture. Topics include women writers; representations of women, domesticity, and the family in the novel, in drama, in satire; early feminist writing; literary constructions of gender. May be repeated for credit as topics vary.

**Lit/En 146. Women and English/American Literature (4)**

Selected topics concerning women and the anglophone literature. Topics include women writers, the literary representation of women and women as readers. May be repeated for credit as topics vary.

**Lit/En 150. Gender, Text, and Culture (4)**

This course studies representations of the sexes and of their interrelationship in various forms of writing produced during different phases of English history. Emphasis will be placed upon connections of gender and of literature to other modes of social belief, experience, and practice. Repeatable for credit when topics vary.

**Lit/En 185. Themes in Afro-American Literature (4)**

An intensive examination of a characteristic theme, special issue, or period in Afro-American literature. May be repeated for credit when topics vary. (May be taken for women's studies credit when the theme of women is a course focus.)

**Lit/Gen 101. Women in Antiquity (4)**

Selected topics in classical culture including women and myth, women in Greek and Roman society, and the representation of women in classical literature. May be repeated for credit as topics vary.

**Lit/Gen 123. Women in Italy (4)**

(Same as Lit/Ital 140.)

A study of historical, political, and literary texts regarding women and feminism in Italian society.

**Lit/Gen 187. Women and Literature (4)**

This course will explore the relationship between women and literature, i.e., women as producers of literature, as objects of literary discourse, and as readers. Foreign language texts will be read in translation. May be repeated for credit as topics vary.

**Lit/Gen 189. Gender Studies (4)**

The study of the construction of sexual differences in literature and culture. May be repeated for credit as topics vary.

**Lit/Th 101. Issues in Feminist Theory (4)**

The study of selected issues in feminist theory, feminist approaches to literature, and the function of feminist critics in society. May be repeated for credit as topics vary.

**Music 115. Women in Music (4)**

An historical survey of women musicians from the Middle Ages to today. The course will deal with an historical view of women's place as creative and representative artists, the societal and political influences that governed their existence and their music. *Prerequisite: consent of instructor.*

**Poli Sci. 115A. Gender and Politics (4)**

Introduction to issues of women, men, and the political process in America. Focus on old and new feminist agendas: role equity, role change; voting behavior; backlash; marginality; gender gap. A special segment on Phyllis Schlafly and the movement STOP-ERA. *Prerequisite: upper-division standing.*

**Poli Sci. 115B. Topics in Feminist Theory (4)**

Reading course with two short papers covering a selection of major writers and thinkers about gender differences, gender bias, sex-role socialization, language, reproductive freedom, affirmative action, and feminist socialism. Writers will include: de Beauvoir, Millett, Heilbrun, Chodorow, Dinerstein, Brown, Miller, Gilligan, Firestone, Eisenstein, Rich, and others. *Prerequisites: upper-division standing.*

**Poli Sci. 115C. Topics in Gender and Public Policy (4)**

This course will cover several areas that impinge on science, technology and gender, including: women, politics and war, reproductive technologies, toxics, childbearing vulnerabilities, mathematics ability and disability-genetics, hormones, and socialization. Students will be required to research and write a twenty-five- to thirty-page paper in one of these areas in addition to taking a final examination. *Prerequisite: upper-division standing.*

**Poli Sci. 134P. Organizing Women in Latin America (4)**

Survey of women's participation in formal political institutions in Latin America (public bureaucracies, political parties, trade unions, peasant organizations), the politics of gender in recent women's movements, and the impact on women of democratization and neoliberal economic policies. *Prerequisite: Poli Sci. 11 or consent of instructor.*

**Sociol. 103F. Feminist Criticism and Social Theory (4)**

This course will examine recent contributions to social theory from feminist critics and scholars. Theoretical writings will be paired with empirical studies illustrating the development and application of these ideas. The central concern of these investigations will be to reconcile new theories of subjectivity and multiple social worlds with classical understandings of society as a coherent body of practices. *Prerequisite: upper-division standing.*

**Sociol. 118. Sociology of Sex and Gender Roles (4)**

An analysis of the social, biological, and psychological components of becoming a man or a woman. The course will survey a wide range of information in an attempt to specify what is distinctively social about gender roles and identities; i.e., to understand how a most basic part of the "self"—womanhood or manhood—is socially defined and socially learned behavior.

**Sociol. 120W. Women in Comparative Perspective (4)**

The purpose of this course is to examine the status of women in various parts of the world. Several cultures will be compared. Attention will be paid to the influence of cultural, socio-political, and economic factors on gender inequality. Women's roles in society, the community, and the family will be discussed.

**Sociol. 129. The Family (4)**

An examination of the family as an institution in modern and premodern societies. This course will begin with a study of the principles of kinship and then investigate the relationship of the family to social structure and social change.

**Sociol. 133. Comparative Sex Stratification (4)**

Utilizing a new theory of factors affecting female status, we examine topics including women in evolutionary perspective; Third World women and modernization; women's changing position in the USSR, Israeli Kibbutz, and especially the U.S.A.; and the political economy of sex stratification.

**Vis. Art 123H. Images of Women in Medieval and Renaissance Art (4)**

Images of women were central to medieval and Renaissance art, reflecting the importance of women in the religious and social theories of the times. Eve, the first woman, and Mary, mother of God, were two archetypes which dominated the period's view of women, but saints, witches, goodesses, and courtly ladies also figured prominently in the art of churches, palaces, and towns. This course explores what this rich variety of images reveals about medieval and Renaissance attitudes towards women; what role images of women played in the culture of daily life; and what impact they have had on representations of women in later art. *Prerequisites: none. Western Art II (VA 12), Art of the Middle Ages (VA 122A), and/or Art of the Renaissance (VA 122B) recommended.*

**Vis. Art 127C. Female Artists and Female Imagery (4)**

This course will analyze the equivocal role of women as artists in selected non-Western societies with a look at parallel phenomena in the West. It will also examine, within given cultural contexts, the significance of female imagery: what type of female images predominate (e.g., mother/child, splayed female, etc.) and who are the patrons and/or consumers of these images. *Prerequisite: one upper-division art history course; two recommended.*



**UCSD EQUAL EMPLOYMENT OPPORTUNITY (EEO)/ AFFIRMATIVE ACTION POLICY STATEMENT**

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RECIPIENTS**

The salary averages are figured according to  
occupational classifications.

Occupation	Average Salary
Technical	\$31,600
Managerial	\$24,100
Sales/Marketing	\$23,200
Health/Life Sciences	\$21,100
Finance	\$22,900
Human Services	\$21,400
Communications	\$20,500

The employment status of the graduates  
who sought to enter the workforce is as fol-  
lows:

Employed Full time	80%
Employed Part time	11%
Seeking employment	8%

Source: *UCSD Graduates—A Summary of  
1990 Survey Results*. Information based  
only on those who sought to enter the  
workforce immediately after graduation.  
Survey conducted of June 1990 graduates  
in December, 1990.

**UCSD FACTS AND FIGURES  
(AS OF FALL 1990)**

On-campus student enrollment	
Undergraduate	14,490
Muir	3,519
Revelle	3,294
Third	3,127
Warren	3,360
Fifth	1,092
Graduate	2,318
Medical School (excluding 466 Medical Center residents and interns)	531
Total Students	17,805
On-campus teaching faculty members	
	1,054

**APPENDIX**

Members of Honorary Societies/Prizes/Awards

American Academy of Arts and Sciences fellows	55
American Philosophical Society fellows	10
Econometric Society fellows	6
Fields Medal Recipients	1
Institute of Arts and Letters	2
Institute of Medicine members	8
International Academy of Astronautics members	7
National Academy of Education members	3
National Academy of Engineering members	12
National Academy of Sciences members	54
National Medal of Science recipients	6
Nobel Prize laureates	6
Pulitzer Prize	1

Total land area—UCSD

Main campus	1,155
Outlying areas	393
UC Natural Reserves	414
Total acres	1,962

Books in library collection	2,055,113
UCSD Extension enrollment	26,869

Grade-point averages

Lower-division undergraduate	2.93
Upper-division undergraduate	3.02
Graduate	3.74

Number of undergraduates in most popular majors

Biology	2,665
Applied Mechanics and Engineering Sciences	1,555
Political Science	1,052
Psychology	1,019
Economics	895

Communication	682
Electrical and Computer Engineering	644
Literature	635
Computer Science and Engineering	457
Mathematics	377
Visual Arts	373
Physics	353
Chemistry	335

Based upon previous three years' experience, approximately 95 percent of all undergraduates enrolled at UCSD in the fall quarter will also be enrolled for the spring quarter. Questions or requests for more detailed information should be directed to the Campus Planning Office.



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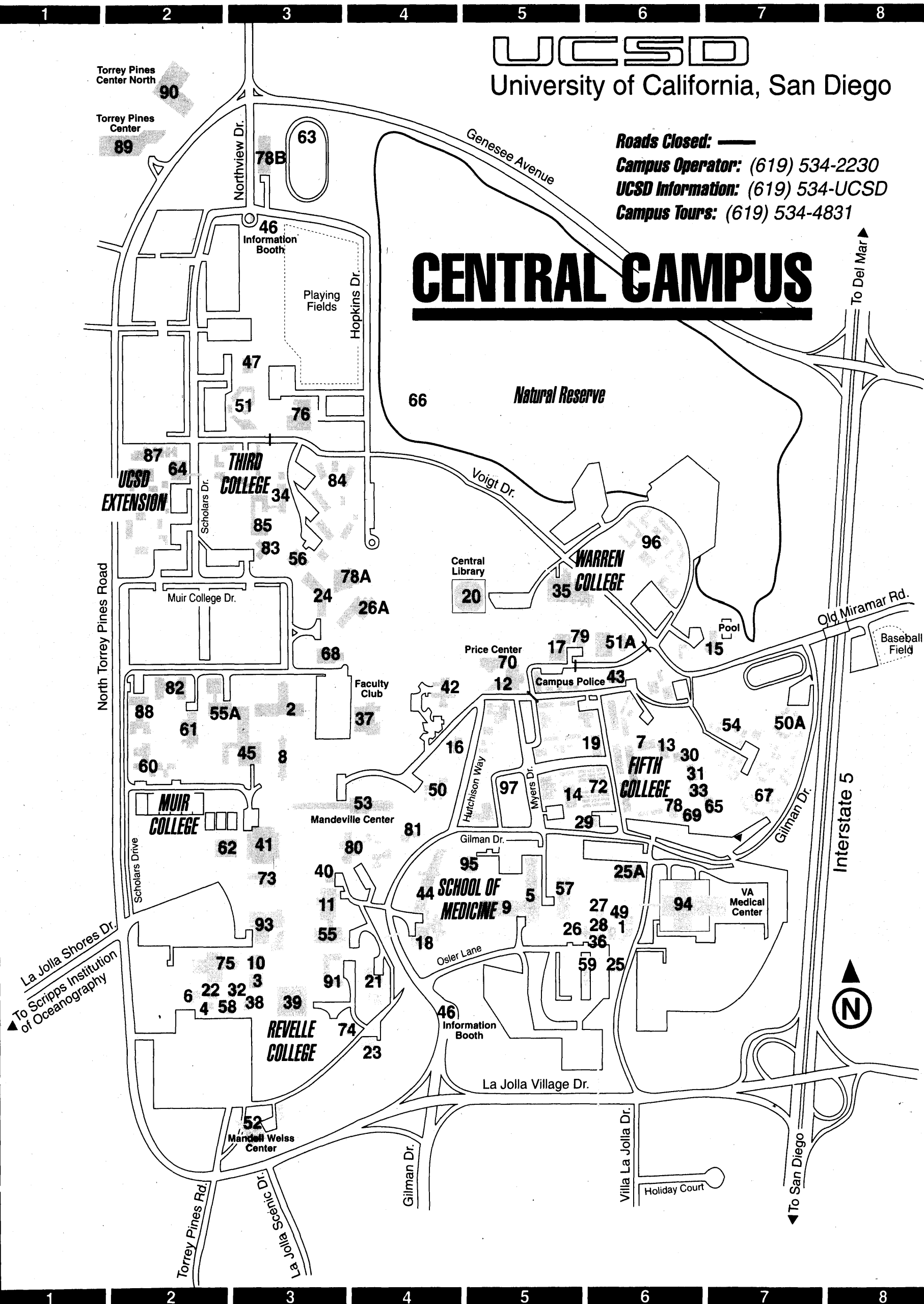
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28	Continuing Medical Education Adm. Bldg.	I-6	85	Third College Humanities Bldg.	E-3
29	Credit Union	H-6	87	Third College Residence Halls	E-2
30	Dana Hall	G-6	88	Tioga Hall	G-2
31	DeAnza Hall	G-6	89	Torrey Pines Center, 10280 North Torrey Pines Rd.	B-2
32	Discovery Hall	J-3	90	Torrey Pines Center North 10300 North Torrey Pines Rd.	A-2
33	Drake Hall	H-7	91	Undergraduate Sciences Bldg.	J-3
34	Economics Bldg.	E-3	93	Urey Hall	I-3
35	Engineering Bldg.	F-5	94	Veterans Adm. Medical Center	I-6
36	Eye Center	I-6	95	Visual Arts Studio	H-5
37	Faculty Club, Ida and Cecil Green	G-4	96	Warren College Apartments	E-6
38	Galathea Hall	J-3	97	Warren Theatre	H-5
39	Galbraith Hall	J-3			
40	Grove Gallery/Crafts Center	I-3			
41	Gymnasium	H-3			
42	Health Center, Student	G-4			
43	High Bay Physics Laboratory	G-6			

# UCSD

University of California, San Diego

**Roads Closed:** —  
**Campus Operator:** (619) 534-2230  
**UCSD Information:** (619) 534-UCSD  
**Campus Tours:** (619) 534-4831

## CENTRAL CAMPUS



La Jolla Shores Dr.  
To Scripps Institution of Oceanography



To San Diego

To Del Mar

Old Miramar Rd.

Interstate 5

Baseball Field

Pool

Holiday Court

Villa La Jolla Dr.

Gilman Dr.

La Jolla Scripps Dr.

Torrey Pines Rd.

North Torrey Pines Road

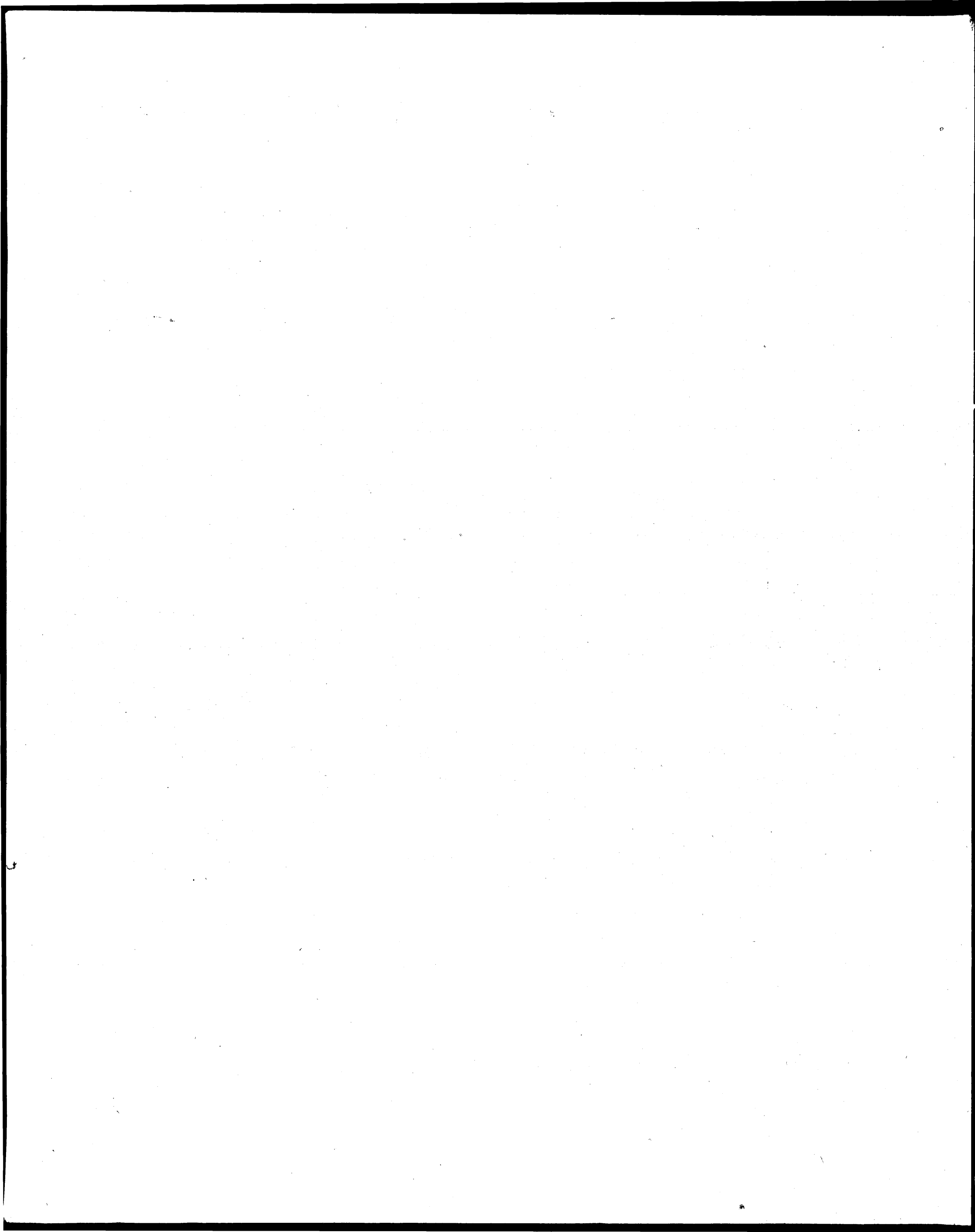
Scholars Drive

Muir College Dr.

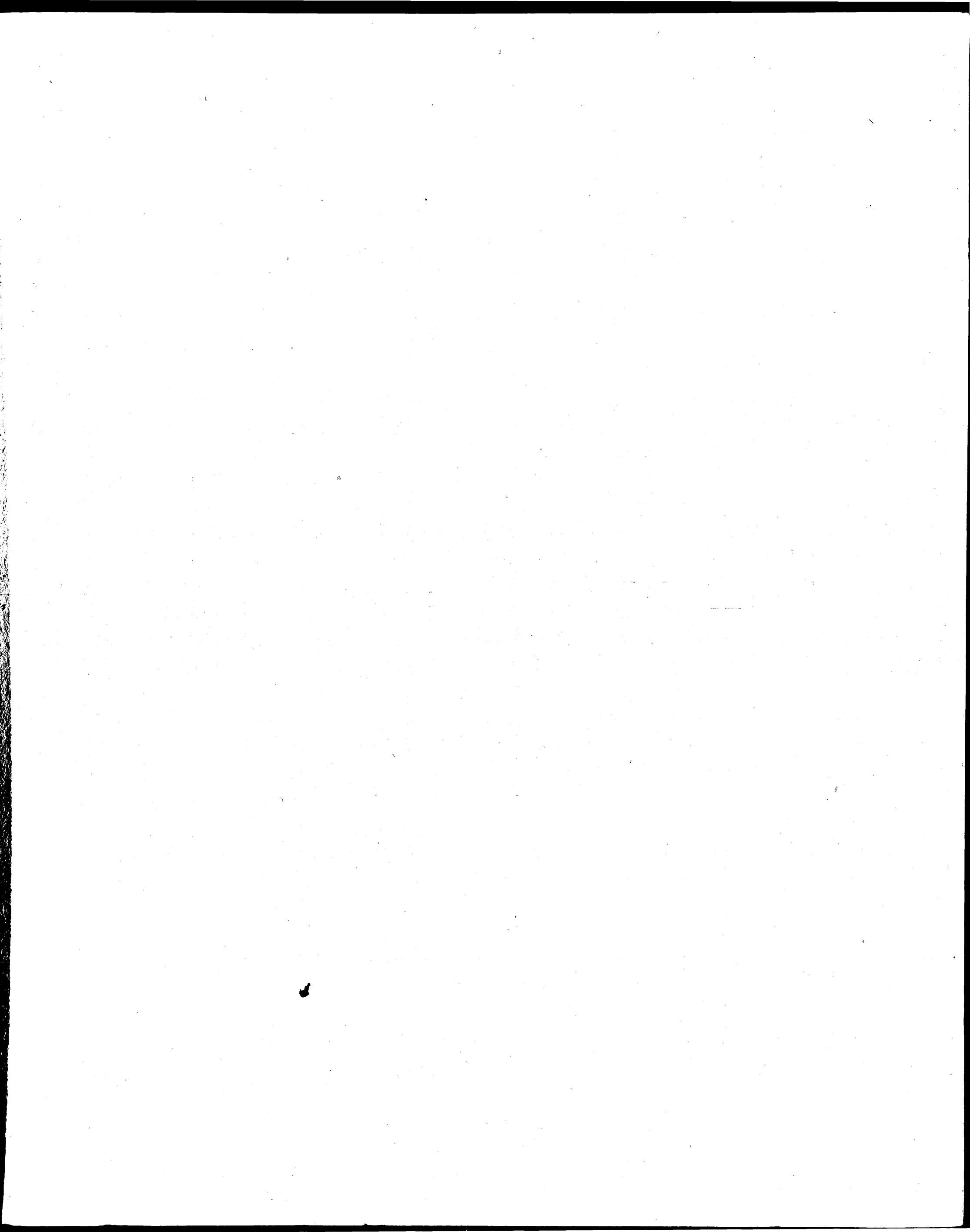
Scholars Dr.

Hopkins Dr.

Genesee Avenue









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